
Release Notes

31 March 2021



Borsa Italiana - IDEM

SOLA Trading System - Version 15

Release Notes

31 March 2021

Version 1.2



London

Stock Exchange Group

1.0 Document history

This document has been through the following iterations:

Version	Date	Section	Description
1.0	15 October 2020		First issue of this document published via Borsa Italiana's website and distributed to Borsa Italiana's customers.
1.1	18 March 2021	6.1.4	Specified that reference to trading capacity "House" includes account types "House" and "Matched Principal".
1.2	31 March 2021	2.0	Confirmation of second CDR and go-live dates.

2.0 Purpose

This document provides Borsa Italiana's customers with a high-level functional description of the changes introduced in Version 15 of the SOLA® Trading System, as well as guidelines for the technical impacts of these business enhancements. Full details of the changes to the SOLA® trading and market data protocols are described in the SAIL, FIX 4.2 and HSVF technical specifications indicated in paragraph 4. For a summary of these changes, please refer to paragraphs from 7 to 12 of these Release Notes. In case of any discrepancy between this document and the SAIL, FIX and HSVF technical specifications, technical specifications shall prevail.

Version 15 of the SOLA® Trading System was released in the CDS environment in October 2020. The first Customer Dress Rehearsal was held on 27 March 2021, and a second CDR will be held on 10 April 2021. Target go-live (subject to the positive outcome of tests) is on 26 April 2021.

3.0 Readership

This document is particularly relevant to technology teams of IDEM's member firms, as it describes the changes to the technical interfaces in use to connect to the IDEM market.

4.0 Document series

This document is part of a series of documents which provide technical specifications for the SOLA® Trading System. This series of documents includes:

- IDEM - Guide to the Trading System
- SOLA Connectivity Guide

- SAIL Protocol: SAIL Specification
- FIX Protocol: FIX 4.2 Specification
- HSVF Market Data
- IDEM - Guide to PTV functionality

The latest version of these documents is available at the following links, where a guide to the conformance test for this new version of the SOLA® Trading System is also available:

- Italian Version:

www.borsaitaliana.it/borsaitaliana/gestione-mercati/migrazioneidem/migrazioneidem.htm

- English Version:

www.borsaitaliana.it/borsaitaliana/gestione-mercati/migrazioneidem/migrazioneidem.en.htm

5.0 Enquiries

In case of any functional question regarding the services outlined in this document, please contact Borsa Italiana - Client Technology Services Italy at the following phone numbers and e-mails:

Client Support

- Toll Free: 0080026772000
- From Mobile: +390245411399
- Email: client-support@borsaitaliana.it

Market Access

- Telephone: +39 0272426 668
- Email: market-access@borsaitaliana.it

Customer Relationship Management

- Telephone: +39 02 72426 512
- Email: clients-services@borsaitaliana.it

6.0 New functionalities supported in Version 15 of the SOLA[®] Trading System

Version 15 of the SOLA[®] Trading System will support the following main functional enhancements:

- Client Price Improvement (“CPI”) functionality (subject to regulatory approval);
- possibility to configure strategy instruments with implied-in prices only.

A description of the key features of these enhancements, reason for change and relevant protocol changes are described in the following paragraphs.

6.1 Client Price Improvement functionality (subject to regulatory approval)

With the Client Price Improvement functionality, IDEM market participants are offered a new way to handle pre-agreed transactions against a client, including transactions with size below the MiFIR / MiFID 2 large-in-scale threshold. This is possible under the condition that: (a) the participant is trading using its own capital against the client, and (b) the transaction is offered for execution in the public order book first.

The CPI functionality involves:

- a client of an IDEM member (the “Client”), that is willing to buy or sell an IDEM contract for a certain quantity (the “pre-agreed quantity”), at a minimum (sell) or maximum (buy) price (the “pre-agreed price”) or at better price conditions, where possible. The CPI functionality ensures that the Client CPI Order is always fully executed, while respecting the pre-agreed price conditions;
- an IDEM member (the “Broker”) that is inserting the Client CPI order on behalf of the Client in the trading system, with “Client” account;
- an IDEM member (the “Member”¹) that is offering itself as the counterpart for the transaction (always with “House” capacity), at the pre-agreed price and for a maximum quantity equal to the pre-agreed quantity, in case all or part of the pre-agreed quantity cannot be executed in the order book first at better prices. The Member CPI Order can only interact with the Client CPI Order and has no certainty of execution;
- all IDEM participants, that can provide liquidity in the order book to improve the price offered by the Member to the Broker and its Client².

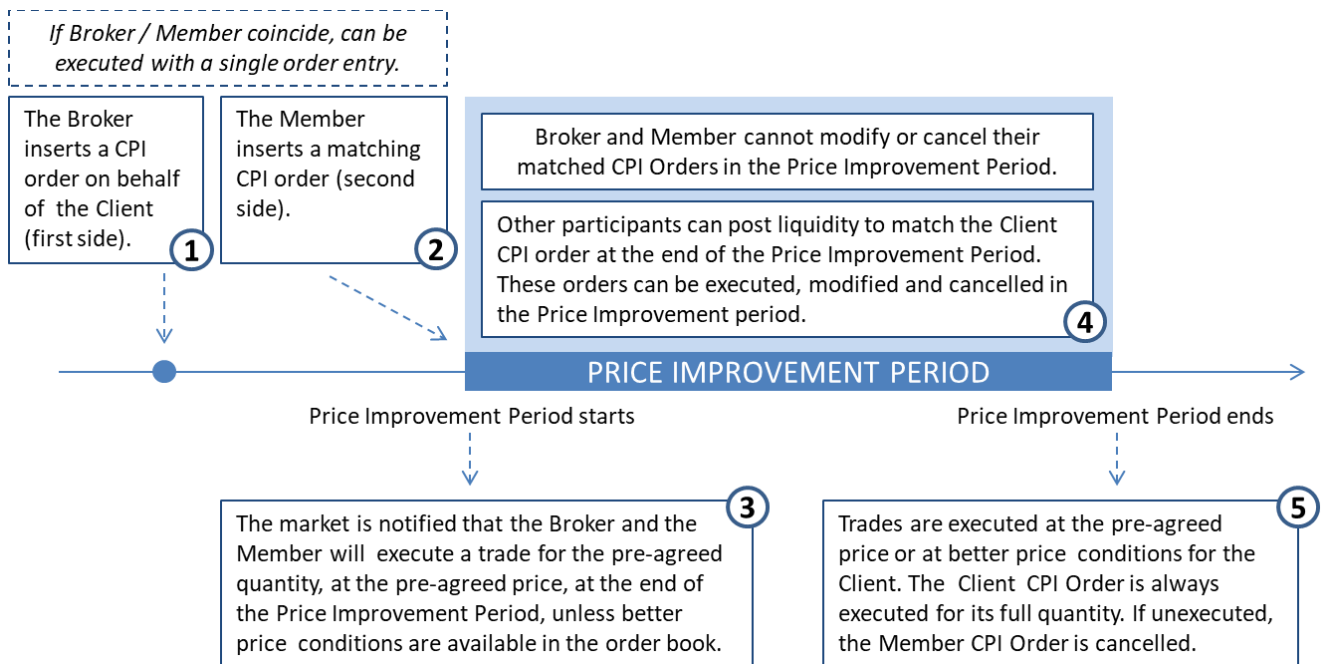
¹ The same participant can act as Broker and Member. See paragraph 6.1.1.

² From an operational and regulatory standpoint, the transaction always is executed between the Broker (acting on behalf of the Client) and the IDEM Member or another IDEM participant. In order to simplify reading, we will refer interchangeably to the Client and the Broker in the rest of this document.

6.1.1 Functional workflow of the CPI functionality

This paragraph provides a high-level description of the CPI functionality. Additional details are described in paragraphs from 6.1.2 to 6.1.5.

Figure 1: High-level workflow for the CPI functionality



a) The CPI workflow begins when the Broker (acting on behalf of the Client) and the Member agree on the details of a potential transaction, and they enter its details into the trading system. Order entry can be executed by submitting:

- two matching CPI Orders, via two SAIL “OE” or FIX “New Order - Single” (35=D) messages (**1** and **2** in Figure 1), or;
- one single “internal” CPI Order, via SAIL “OX” or FIX “New Order Cross” (35=D) message (in case the same participant acts as the Broker and the Member).

In both cases, the order entry message(s) will have to specify all details of the transaction, including the identity of the pre-identified counterparty.

In order to be managed as a “CPI Order”, these messages must be inserted with a new value of SAIL field “Price Type” / FIX field “OrdType”³ (“CPI order”). Otherwise, they will be considered by the system as a standard request to execute a bilateral transaction and will be automatically subject to the related regulatory restrictions.

³ Value “I” for SAIL field “Price Type”; value “R” for FIX field “OrdType”.

- b) When the trading system receives a CPI Order, it validates its price and quantity. When two matching CPI Orders are received, the system also validates the permitted combination of account types. Please refer to paragraph 6.1.4 for full details on these controls.
- c) In case all validations are passed:
- the system disseminates a CPI Notice message⁴ to inform the market that, at the end of the “Price Improvement Period” (as defined below), and unless better price conditions are available at the end of the Price Improvement Period, a CPI transaction between the Client and the Member will be executed for the pre-agreed quantity, at the pre-agreed price;
 - the CPI Notice message will NOT disseminate the Client side (buy or sell) of the transaction;
 - a Price Improvement Period⁵ is started, during which all IDEM participants can react to the CPI Notice message and post additional liquidity in the order book;
 - the two CPI Orders are parked, to be released into the order book for execution at the end of the Price Improvement Period.
- d) During the Price Improvement Period:
- the Broker (on behalf of the Client) and the Member cannot modify or cancel their matched CPI Orders;
 - IDEM participants can insert, modify or cancel their Answers to the CPI Notice Message. It will be possible to require that an Answer is automatically cancelled, if not fully executed: (a) in case the Price Improvement Period is interrupted for any reason, or (b) at the end of the Price Improvement Period. This behaviour (for orders only, not available for quotes) is implemented using a new value of SAIL field “Duration Type” / FIX field “TimeInForce”⁶ (“Valid for the current CPI only”).
- e) At the end of the Price Improvement Period:
- the Member CPI order is released into the order book. Due to the nature of the CPI functionality, it will interact only with the Client CPI order;
 - the Client CPI Order will aggress the order book and will be executed at the best available price conditions, up to the pre-agreed price;
 - any available contra-order that improves the pre-agreed price to the Client will be executed first, by price-time priority;
 - in case a residual quantity of the Client CPI order remains available for execution at the pre-agreed price:
 - orders with time priority before the beginning of the Price Improvement Period will be executed first, by time priority;

⁴ For full technical details of the new “NR” message, please refer to paragraphs from 10 to 12.

⁵ The Price improvement Period is composed by a fixed length sub-period plus a randomized extension of a maximum, pre-determined length as described in paragraph 6.1.4.

⁶ Value “C” in SAIL field “Duration Type”; value “5” in FIX field “TimeInForce”.

- the residual quantity (if any), will be allocated between the Member CPI Order and any available Answer at the pre-agreed price, on the basis of a pre-determined priority algorithm⁷. At go-live, the system will be configured so that all residual quantity will be reserved for execution against the Member CPI Order.

Some examples of the execution workflow are reported in paragraph 6.1.5.

- at the end of the execution workflow, the Member CPI Order and any unexecuted order with Duration Type = “Valid for the current CPI only” will be automatically cancelled.

6.1.2 Additional details

- The CPI functionality will be available during the continuous trading phase only. In case continuous trading (circuit breaker, manual intervention of Borsa Italiana, end of trading day) is interrupted when a Price Improvement Period is ongoing, the two parked CPI orders and any Answer with Duration Type = “Valid for the current CPI only” will be automatically cancelled by the system.
- Only one Price Improvement Period can be ongoing for the same instrument at the same time. In case a CPI Order is received by the trading system when a Price Improvement Period is still ongoing on the same instrument, it will be rejected.
- Trades deriving from the matching of the Client and the Member CPI Orders will not update price statistics (i.e. they will not trigger circuit breakers and stop orders, will not update the last trade price, etc.). These trades will be marked as “X-CPI” in trading and market data protocols.
- A CPI Order on a strategy instrument will not generate implied-out orders on the component legs of the strategy.
- The self-execution prevention functionality (“SEP”) will be ineffective for CPI Orders.

6.1.3 Technical details

The technical workflow of the CPI functionality is reported in figure 2.

⁷ For additional information, please refer to paragraph 6.1.4.

- When a CPI order (Price Type = "I") is accepted by the trading system (step (a) of paragraph 6.1.1), the sender will receive an acknowledgement via "KE" message, as for any other order entered in the trading system⁹:
 - this ack message will include a CPI Request identifier (in field "Proposal ID") uniquely attributed by the trading system for the day to the CPI Request¹⁰;
 - the Status of the received order, waiting for a matching contra-order, will be set as "K" = "Parked" (similarly to untriggered stop orders).
- When the two CPI orders for the same CPI Request are matched and validated by the trading system, a "CPI Notice" message ("NR") is returned to the Broker and the Member and it is disseminated to the whole market via market data. In addition to the pre-agreed price and quantity, this message will include:
 - the CPI Request identifier;
 - the start time and end time of the Price Improvement Period (excluding its random extension);
 - a "CPI status" = " " (blank), indicating that a new Price Improvement Period for the instrument has started.
- In case a Price Improvement Period is interrupted:
 - a second CPI Notification message "NR" is also disseminated, including the CPI Request identifier and the reason for the interruption (field "CPI Status" equal to "C" = "cancelled due to circuit breaker", "E" = "eliminated by the system" or "M" = "cancelled by Borsa Italiana");
 - unexecuted Answers with Duration Type = "Valid for the current CPI only", as well as the unexecuted CPI Orders, are cancelled. Related participants are notified with a cancellation ack. message ("NZ"), with field "Status" equal to "C" = "cancelled due to circuit breaker", "E" = "eliminated by the system" or "M" = "cancelled by Borsa Italiana".
- When the two CPI orders are inserted in the order book for execution at the end of the Price Improvement Period, a second order ack message will be returned to the Broker and the Member, with an updated value in "Status" field (from "K" = "Parked" to " " (blank) = "inserted in the order book").
- Until the execution workflow for the two CPI orders is completed, no order book update is disseminated via HSVF and GTP market data services. Accordingly, the House and Client CPI orders are not disseminated by GTP incremental services.

⁹ In case of order entry via "OX" message, two acknowledgements (one per side) are returned, each one with its own Order ID and the same Proposal ID. Matching is immediately executed.

¹⁰ A unique identifier for the CPI Request (at market level and for the trading day) can be obtained by chaining the following fields: [Group ID] + [Instrument ID] + [Proposal ID].

- Transactions following execution of the aggressive Client CPI order at the end of the Price Improvement Period will be identified as follows:
 - in market data protocol HSVF (Trade messages “C”, “CF”, “CS”) with a new, dedicated field named “CPI Price Indicator Marker”:
 - value “c” = “CPI trade”: for transactions between the Client CPI Order and any resting order different from the Member CPI order;
 - value “x” = “X-CPI trade”: for transactions between the Client CPI Order and the Member CPI order.
 - in SAIL Execution Notices (“NT” and “NL”), using the existing fields “Special Trade Indicator”. This field will use the same values “c” = “CPI trade” and “x” = “X-CPI trade” to identify transactions from the CPI execution workflow.

In case: (a) the Client CPI order has matched against an implied-out order, or (b) matching occurred in a strategy order book, all individual strategy and leg transactions connected by the strategy trade will be marked with the same flag.

- Once the execution workflow of the aggressive Client CPI order is completed, unexecuted orders with Duration Type = “Valid for the current CPI only”, as well as any unexecuted quantity of the CPI Member order, are cancelled. Related participants are notified with a cancellation ack. message (“NZ”), with field “Status” equal to “E” = “eliminated by the system”.
- In case a circuit breaker is triggered by the aggressive Client CPI order, unexecuted orders with Duration Type = “Valid for the current CPI only”, as well as the unexecuted CPI Orders, are cancelled. Related participants are notified with a cancellation ack. message (“NZ”, with field “Status” equal to “C” = “cancelled due to circuit breaker”).

A synthesis of all protocol changes is reported in paragraphs 7-11 in these Release Notes and in the SAIL, FIX and HSVF Guides indicated in paragraph 4.

6.1.4 Trading parameters for the CPI functionality

The following system parameters are currently under discussion with IDEM regulators and participants and will be confirmed in due course.

- Instruments: the CPI functionality will be initially active only on the following contracts (for all available expiries, settlement styles and exercise style):
 - FTSE MIB options;
 - Stock options.

The opportunity to introduce the CPI functionality for index futures, stock futures, dividend stock futures and commodity derivatives will be assessed at a later stage.

- Price, quantity and account types controls (as described in step (b) of paragraph 6.1.1):
 - permitted account types: Client vs. House and Client vs. Matched Principal. Any other combination for the two CPI Orders will be rejected;
 - minimum quantity for a CPI request: as reported in the following table:

Contract	Minimum quantity (lots)
FTSE MIB options	20
FTSE MIB weekly options	10
Stock options	For each underlying, equal to the corresponding minimum quoting size obligation for Primary Market Makers (stock options) and Designated Market Maker (weekly stock options)
Weekly stock options	

- maximum quantity / value: as per any other single order inserted in the order book. See Section 4, paragraph B1 of the “Guide to Trading Parameters”;
- permitted order price bands: as reported in the following table:

Contract	Max. deviation from BBO / dynamic price (if no BBO available)
FTSE MIB options	20%
Stock options	10%

- length of the Price Improvement Period (step (c) of paragraph 6.1.1): 500ms, with a randomized extension period of 100ms.
- percentage of the residual quantity of the Client CPI order that is reserved for execution against the Member CPI, in case other orders are available at the pre-agreed price (step (e) of paragraph 6.1.1):
 - (parameter “Reserved Quantity”, from 0 to 100%) = 100%. This implies that, at the Pre-Agreed Price, any residual quantity of the Client CPI Order will always be executed against the House CPI Order. Any Answer available in the order book at the Pre-Agreed price will not be executed.
- allocation rule for the residual quantity of the Client CPI order after execution of the reserved quantity at the pre-agreed price (“by time priority” or “pro-rata”¹¹): by time priority.

¹¹ This configuration is only relevant in case the “Reserved quantity” parameter is set at a value below 100%. So, this parameter will not be relevant at the go-live date of the CPI functionality. For additional information, please refer to the Guide to the Trading System.

6.1.5 Examples

For all examples:

- CPI request @99.9 for a quantity of 20, with side of Client CPI order = “Buy” (Member CPI order = “Sell”);
- percentage of the residual quantity of the Client CPI order that is reserved to the Member CPI order at the pre-agreed price (parameter “Reserved Quantity”): as indicated in each example;
- allocation rule for the residual quantity of the Client CPI order after execution of the reserved quantity at the pre-agreed price: by time priority (not relevant at go-live, see note 11).

Orders are indicated in the queue on the basis of their price and time priority.

Answers are indicated in red letters, while the Member CPI order is indicated in red bold letters.

The “Order book at the end of the Price Improvement Period” includes the Member CPI Order. Please note that, as specified in paragraph 6.1.3, the CPI Orders are never disseminated in market data protocols, and no order book update is disseminated until the CPI execution workflow is completed. For this reason, this intermediate status of the order book will not be visible to market participants.

Example 1: the pre-agreed price is within the BBO at the beginning of the Price Improvement Period

“Reserved Quantity” = 100%

<p>Order book before the Price Improvement Period starts:</p> <table border="1"> <thead> <tr> <th colspan="2"></th> <th colspan="2">Buy</th> <th colspan="2">Sell</th> </tr> <tr> <th>ID</th> <th>Qty</th> <th>P</th> <th>P</th> <th>Qty</th> <th>ID</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>100</td> <td>99.6</td> <td>100.1</td> <td>100</td> <td>C</td> </tr> <tr> <td>D</td> <td>100</td> <td>99.5</td> <td>100.2</td> <td>100</td> <td>B</td> </tr> <tr> <td></td> <td></td> <td></td> <td>100.3</td> <td>100</td> <td>E</td> </tr> </tbody> </table>			Buy		Sell		ID	Qty	P	P	Qty	ID	A	100	99.6	100.1	100	C	D	100	99.5	100.2	100	B				100.3	100	E	<p>Order book at the end of the Price Improvement Period (Answers in red, Member CPI order in red bold)*:</p> <table border="1"> <thead> <tr> <th colspan="2"></th> <th colspan="2">Buy</th> <th colspan="2">Sell</th> </tr> <tr> <th>ID</th> <th>Qty</th> <th>P</th> <th>P</th> <th>Qty</th> <th>ID</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>100</td> <td>99.6</td> <td>99.8</td> <td>10</td> <td>G</td> </tr> <tr> <td>D</td> <td>100</td> <td>99.5</td> <td>99.9</td> <td>3</td> <td>F</td> </tr> <tr> <td></td> <td></td> <td></td> <td>99.9</td> <td>1</td> <td>I</td> </tr> <tr> <td></td> <td></td> <td></td> <td>99.9</td> <td>20</td> <td>L</td> </tr> <tr> <td></td> <td></td> <td></td> <td>100.0</td> <td>30</td> <td>H</td> </tr> <tr> <td></td> <td></td> <td></td> <td>100.1</td> <td>100</td> <td>C</td> </tr> <tr> <td></td> <td></td> <td></td> <td>100.2</td> <td>100</td> <td>B</td> </tr> <tr> <td></td> <td></td> <td></td> <td>100.3</td> <td>100</td> <td>E</td> </tr> </tbody> </table> <p>(*) After insertion of the Member CPI Order, and before insertion of the Client CPI Order.</p>			Buy		Sell		ID	Qty	P	P	Qty	ID	A	100	99.6	99.8	10	G	D	100	99.5	99.9	3	F				99.9	1	I				99.9	20	L				100.0	30	H				100.1	100	C				100.2	100	B				100.3	100	E
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At the end of the Price Improvement Period, the Client CPI Order is inserted as an aggressive buy limit order @99.9 (quantity = 20) and triggers the following executions:

- Trade 1 @99.8 (quantity = 10) against order “G”;
- Trade 2 @99.9 (quantity = 10) against order “L” (the Member CPI order) since a Reserved Quantity of 100% is configured in the trading system. Thanks to this configuration, the Member CPI Order is allocated the full residual quantity even if it is technically inserted in the order book at the end of the Price Improvement Period (after orders F and I).

In the case of system configuration with Reserved Quantity = 50%, the following executions would be triggered instead:

- Trade 1 @99.8 (quantity = 10) against order “G”;
- Trade 2 @99.9 (quantity = 5) against order “L” (the Member CPI order) since a reserved quantity of 50% is configured in the trading system;
- Trade 3 @99.9 (quantity = 3) against order “F”, since it is the first order by time priority at the pre-agreed price;
- Trade 4 @99.9 (quantity = 1) against order “I”, since it is the second order by time priority at the pre-agreed price;
- Trade 5 @99.9 (quantity = 1) against order “L” (the Member CPI Order) since any residual quantity, after execution of the available Answers at the pre-agreed price, is allocated to the Member CPI Order.

Example 2: the pre-agreed price equals the best price available to the Client at the beginning of the Price Improvement Period

“Reserved Quantity” = 100%

<p>Order book before the Price Improvement Period starts:</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th colspan="2"></th> <th colspan="2">Buy</th> <th colspan="2">Sell</th> </tr> <tr> <th>ID</th> <th>Qty</th> <th>P</th> <th>P</th> <th>Qty</th> <th>ID</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>100</td> <td>99.6</td> <td>99.9</td> <td>5</td> <td>C</td> </tr> <tr> <td>D</td> <td>100</td> <td>99.5</td> <td>100.1</td> <td>100</td> <td>B</td> </tr> <tr> <td></td> <td></td> <td></td> <td>100.2</td> <td>100</td> <td>E</td> </tr> </tbody> </table>			Buy		Sell		ID	Qty	P	P	Qty	ID	A	100	99.6	99.9	5	C	D	100	99.5	100.1	100	B				100.2	100	E	<p>Order book at the end of the Price Improvement Period (Answers in red, CPI House order in red bold)*:</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th colspan="2"></th> <th colspan="2">Buy</th> <th colspan="2">Sell</th> </tr> <tr> <th>ID</th> <th>Qty</th> <th>P</th> <th>P</th> <th>Qty</th> <th>ID</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>100</td> <td>99.6</td> <td>99.8</td> <td>10</td> <td>G</td> </tr> <tr> <td>D</td> <td>100</td> <td>99.5</td> <td>99.9</td> <td>5</td> <td>C</td> </tr> <tr> <td></td> <td></td> <td></td> <td>99.9</td> <td>8</td> <td>F</td> </tr> <tr> <td></td> <td></td> <td></td> <td>99.9</td> <td>20</td> <td>I</td> </tr> <tr> <td></td> <td></td> <td></td> <td>100.0</td> <td>30</td> <td>H</td> </tr> <tr> <td></td> <td></td> <td></td> <td>100.1</td> <td>100</td> <td>B</td> </tr> <tr> <td></td> <td></td> <td></td> <td>100.2</td> <td>100</td> <td>E</td> </tr> </tbody> </table> <p style="font-size: small; margin-top: 5px;">(*) After insertion of the Member CPI order, and before insertion of the Client CPI order.</p>			Buy		Sell		ID	Qty	P	P	Qty	ID	A	100	99.6	99.8	10	G	D	100	99.5	99.9	5	C				99.9	8	F				99.9	20	I				100.0	30	H				100.1	100	B				100.2	100	E
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- Trade 1 @99.8 (quantity = 10) against order “G”;
- Trade 2 @99.9 (quantity = 5) against order “C”, since it was present in the order book before the beginning of the Price Improvement Period;
- Trade 3 @99.9 (quantity = 5) against order “I” (the CPI Member order) since a reserved quantity of 100% is configured in the trading system. Due to this configuration of the “Reserved Quantity” parameter, the CPI Member order is allocated the full residual quantity of the CPI Client order, even if it is inserted in the order book at the end of the Price Improvement Period (after order F).

Example 3: the pre-agreed price is outside the BBO at the beginning of the Price Improvement Period

“Reserved Quantity” = 100% (or any other value).

<p>Order book before the Price Improvement Period starts:</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th colspan="2"></th> <th colspan="2">Buy</th> <th colspan="2">Sell</th> </tr> <tr> <th>ID</th> <th>Qty</th> <th>P</th> <th>P</th> <th>Qty</th> <th>ID</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>100</td> <td>100.0</td> <td>100.2</td> <td>100</td> <td>C</td> </tr> <tr> <td>D</td> <td>100</td> <td>99.8</td> <td>100.3</td> <td>100</td> <td>B</td> </tr> <tr> <td></td> <td></td> <td></td> <td>100.4</td> <td>100</td> <td>E</td> </tr> </tbody> </table>			Buy		Sell		ID	Qty	P	P	Qty	ID	A	100	100.0	100.2	100	C	D	100	99.8	100.3	100	B				100.4	100	E	<p>Order book at the end of the Price Improvement Period (Answers in red, CPI House order in red bold)*:</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th colspan="2"></th> <th colspan="2">Buy</th> <th colspan="2">Sell</th> </tr> <tr> <th>ID</th> <th>Qty</th> <th>P</th> <th>P</th> <th>Qty</th> <th>ID</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>100</td> <td>100.0</td> <td>99.9</td> <td>20</td> <td>G</td> </tr> <tr> <td>D</td> <td>100</td> <td>99.8</td> <td>100.1</td> <td>50</td> <td>F</td> </tr> <tr> <td></td> <td></td> <td></td> <td>100.2</td> <td>100</td> <td>C</td> </tr> <tr> <td></td> <td></td> <td></td> <td>100.3</td> <td>100</td> <td>B</td> </tr> <tr> <td></td> <td></td> <td></td> <td>100.4</td> <td>100</td> <td>E</td> </tr> </tbody> </table> <p style="font-size: small; margin-top: 5px;">(*) After insertion of the Member CPI order, and before insertion of the Client CPI order.</p>			Buy		Sell		ID	Qty	P	P	Qty	ID	A	100	100.0	99.9	20	G	D	100	99.8	100.1	50	F				100.2	100	C				100.3	100	B				100.4	100	E
		Buy		Sell																																																																					
ID	Qty	P	P	Qty	ID																																																																				
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			100.4	100	E																																																																				

The insertion of the Member CPI order (that can be executed only against the corresponding Client CPI order) would determine an inverted order book. For this reason, a trade between the two CPI orders is immediately triggered:

- Trade 1 @99.9 (quantity = 20) between the two CPI orders.

Other functional changes

The following improvements and changes will also be introduced in Version 15 of the SOLA® Trading System:

- a) Possibility to configure strategy instruments with “implied-in” prices only (not relevant for IDEM; for CurveGlobal Markets only): with Version 15 of the SOLA® Trading System, it will be possible to configure instruments where implied-in orders only are generated by the trading system^{12,13}. For IDEM instruments, implied-in and implied-out orders are always generated. For more information on implied functionalities for the IDEM market, please refer to the IDEM “Guide to the Trading System”, paragraph 5.3. This change will not have any impact on trading and market data protocols.
- b) Rejection of all orders entered with size zero or no size: starting with Version 15 of the SOLA® Trading System, any order entered with size equal to 0 (zero) or with no size will be automatically rejected. This new behaviour, where relevant, will replace the automatic attribution of a quantity equal to the minimum allowed quantity for the instrument, that is the currently applied by SOLA® for specific order entry messages.

¹² Under this configuration, implied-In orders will be generated: (a) considering only the available prices on the first order book level for each leg of the strategy, and (b) only where sufficient quantity, across all legs, is available to execute at least one lot of the strategy instrument.

¹³ In case of matching between an explicit resting order and an aggressive implied order on the strategy instrument at price P[s], the trade price P[x] attributed to each leg “x” (from leg 1 to leg n of the strategy instrument) will be calculated as follows:

$$P[x]_{leg\ transaction} = P[x]_{order\ book} \quad for\ 1 \leq x \leq n - 1$$

$$P[x]_{leg\ transaction} = P[s] - \sum_{i=1}^{x-1} R[i] * P[i]_{leg\ transaction} \quad for\ x = n$$

where P[x]_{order book} is the best available price to execute the leg transaction in the order book of leg x, and R[i] is the ratio of leg i within the strategy instrument.

7.0 Interface changes: SAIL protocol

The following table provides a description of the changes to the native SOLA[®] Access Information Language (SAIL) protocol, that are introduced by the functional enhancements described in this Release Notes.

Field	Messages	Description of the change	Linked to
Duration Type	OE (Order Entry) KE (Order Acknowledgment) KM (Order Modification Ack.) KZ (Order Cancellation Ack.) NZ (Order Cancellation Notice)	New value of existing field: <ul style="list-style-type: none"> value "C" = "Valid for the current CPI only" (CPI only) 	Client Price Improvement (6.1)
Price Type	NT (Execution Notice) NL (Leg Execution Notice) NX (Execution Cancellation Notice) NY (Leg Execution Cancellation Notice)	New value of existing field: <ul style="list-style-type: none"> value "I" = "CPI" 	Client Price Improvement (6.1)
Proposal Type	KE (Order Acknowledgment) KM (Order Modification Ack) KZ (Order Cancellation Ack.) NZ (Order Cancellation Notice) NT (Execution Notice) NL (Leg Execution Notice) NX (Execution Cancellation Notice) NY (Leg Execution Cancellation Notice)	New field in native messages; new value of existing field in Drop Copy messages: <ul style="list-style-type: none"> value "C" = "CPI" <p>Field "Proposal Type" is currently available in Drop Copy messages only. It will be added to native messages by changing position within the message (refer to SAIL protocol documentation for additional details).</p>	Client Price Improvement (6.1)
Proposal ID	KE (Order Acknowledgment) KM (Order Modification ack) KZ (Order Cancellation ack.) NZ (Order Cancellation notice) NT (Execution Notice) NL (Leg Execution Notice) NX (Execution Cancellation Notice) NY (Leg Execution Cancellation Notice)	Field "Proposal ID" is currently available in Drop Copy messages only. It will be added to native messages by changing position within the message (refer to SAIL protocol documentation for additional details).	Client Price Improvement (6.1)

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Status	KE (Order Acknowledgment) KM (Order Modification Ack.) KZ (Order Cancellation Ack.) NZ (Order Cancellation notice)	New value of existing field: <ul style="list-style-type: none"> value "K" = "Parked" (applicable to orders with Price Type = "I" only) 	Client Price Improvement (6.1)
Special Trade Indicator	NT (Execution Notice) NL (Leg Execution Notice) NX (Execution Cancellation Notice) NY (Leg Execution Cancellation Notice)	New values of existing field: <ul style="list-style-type: none"> value "c" = "CPI trade" value "x" = "X-CPI trade" 	Client Price Improvement (6.1)
[new message]	NR (CPI Notice)	New message to inform market participants of the start / early termination of a Price Improvement Period. Please refer to Appendix 10 for full layout.	Client Price Improvement (6.1)

8.0 Interface changes: FIX 4.2 protocol

The following table provides a description of the changes to the FIX protocol in use by the SOLA[®] Trading System, that are introduced by the functional enhancements described in this Release Notes.

Field	Messages	Description of the change	Linked to
TimeInForce (tag 59)	35 = D (New Order – Single) 35 = G (Order Cancel / Replace Request) 35 = 8 (Execution Report)	New value of existing field: <ul style="list-style-type: none"> value “5” = “Good Till Crossing (GTX)” 	Client Price Improvement (6.1)
OrdType (tag 40)	35 = D (New Order – Single) 35 = s (New Cross Order) 35 = G (Order Cancel / Replace Request) 35 = 8 (Execution Report)	New value of existing field: <ul style="list-style-type: none"> value “R” = “CPI” (stop on bid or offer) 	Client Price Improvement (6.1)
OrdStatus (tag 39)	35 = 8 (Execution Report) 35 = 9 (Order Cancel Reject)	New value of existing field: <ul style="list-style-type: none"> value “A” = “Pending New” (applicable to orders with OrdType = ‘R’ (CPI) only) 	Client Price Improvement (6.1)
SpecialTradeInd (tag 9459)	35 = 8 (Execution Report)	New values of existing field: <ul style="list-style-type: none"> value “c” = “CPI trade” value “x” = “X-CPI trade” 	Client Price Improvement (6.1)
ContraTrader (tag 337)	35 = D (New Order – Single) 35 = G (Order Cancel / Replace Request) 35 = 8 (Execution Report)	Use of existing Tag [337] extended to CPI Requests and related trades.	Client Price Improvement (6.1)
ProposalType (tag 16453)	35 = 8 (Execution Report)	New value of existing field: <ul style="list-style-type: none"> value “C” = “CPI” 	Client Price Improvement (6.1)
TradeReportID (tag 571)	35 = 8 (Execution Report)	In addition to Bundle Orders, this field is now used also for trades deriving from a CPI Request.	Client Price Improvement (6.1)

MsgType (tag 35)	Message header	New value of existing field: <ul style="list-style-type: none"> value "7" = "Advertisement" 	Client Price Improvement (6.1)
[new message]	35 = 7 (Advertisement)	CPI Notice Message: New message to inform market participants of the start / early termination of a Price Improvement Period. Please refer to Appendix 11 for full layout. Includes two new tags [1495] and [1496].	Client Price Improvement (6.1)

9.0 Interface changes: HSVF protocol

The following table provides a description of the changes to the market data (HSVF) protocol, introduced by the functional enhancements described in this Release Notes.

Field	Messages	Description of the change	Linked to
CPI Price Indicator Marker (new field)	C (option trade) CF (future trade) CS (strategy trade) I (option trade cancellation) IF (futures trade cancellation)	Possible values: <ul style="list-style-type: none"> value " " (blank) = "Regular trade" value "c" = "CPI trade" value "x" = "X-CPI trade" 	Client Price Improvement (6.1)
[new message]	NR (CPI Notice)	New message to inform market participants of the start / early termination of a Price Improvement Period. Please refer to Appendix 12 for full layout. Reception of the NR message is enabled using message 'RS' (connection message), by setting 'Market Depth' field to one of the following values: <ul style="list-style-type: none"> 'Y': market depth (top 5 bid/ask) 'I': market depth (top 5 bid/ask) and implied best limit 'N': best bid/ask The CPI Notice message will be received for all products within the classes (futures, options and strategies) with Market Depth set to 'Y', 'I' or 'N'.	Client Price Improvement (6.1)

10.0 “CPI Notice” Message (SAIL)

This message is used to notify a participant that a CPI Request has been started, interrupted or cancelled by the system. Transparency of Verb, Price and Quantity fields is defined at system level by Borsa Italiana.

Field	Field Type	Size	R/C/O	Notes
Message Header		30	R	
Group	Group ID	2	R	Group identifier for the instrument in the CPI Request.
Instrument	Instrument ID	4	R	Identifier for the instrument in the CPI Request.
Verb	Verb	1	O	Side of the Client CPI order (it will be empty in case dissemination of this information is disabled by Borsa Italiana).
Price	Price	10	O	Pre-Agreed price of the CPI Request (it will be empty in case dissemination of this information is disabled by Borsa Italiana).
Quantity	Quantity	8	O	Pre-Agreed quantity of the CPI Request (it will be empty in case dissemination of this information is disabled by Borsa Italiana).
CPI Status	CPI status (enum). Possible values: <ul style="list-style-type: none"> • " " (blank): New CPI started • "M": CPI cancelled by Borsa Italiana • "C": CPI cancelled due to Circuit Breaker • "E": CPI eliminated by the system 	1	R	Describes the reason for the dissemination of the NR message.
CPI Request ID	Proposal ID	8	R	Unique identifier of the CPI Request (per instrument).
Start Time	Time ms (HHMMSSmmuuu)	12	R	Moment when the Price Improvement Period starts.
End Time	Time ms (HHMMSSmmuuu)	12	R	Moment when the fixed length of the Price Improvement Period ends.

11.0 CPI Notification Message (FIX protocol)

This message is used to notify that a CPI Request has been started, interrupted or cancelled by the system. Transparency of Side, Price and Quantity fields is defined at system level by Borsa Italiana.

Field name	Tag	Req	Description	Corresponding field in NR message (SAIL)
Message Header				
Symbol	Tag 55	Y	Identifier for the instrument in the CPI Request.	Group + Instrument
SecurityType	Tag 167	Y	Type of instrument (future / option /strategy).	..
MaturityMonthYear	Tag 200	Y	Month and year of maturity (futures and options only).	..
PutOrCall	Tag 201	C	Put / Call indicator (options only).	..
StrikePrice	Tag 202	C	Strike price (options only).	..
MaturityDay	Tag 205	C	Used in conjunction with Tag 200 to specify a particular maturity date.	..
OptAttribute	Tag 206	C	Indicator for corporate action for the series.	..
Side	Tag 54	O	Side of the Client CPI order - buy or sell (it will be empty in case dissemination of this information is disabled by Borsa Italiana).	Verb
Price	Tag 44	O	Pre-Agreed price of the CPI Request (it will be empty in case dissemination of this information is disabled by Borsa Italiana).	Price
Quantity	Tag 38	O	Pre-Agreed quantity of the CPI Request (it will be empty in case dissemination of this information is disabled by Borsa Italiana).	Quantity
OrdStatus	Tag 39	Y	Describes the reason for the dissemination of the NR message.	CPI Status
TradeReportID	Tag 571	Y	Unique identifier of the CPI Request (per instrument).	CPI Request ID
ComplexEventStartTime	Tag 1495	Y	Moment when the Price Improvement Period starts.	Start Time
ComplexEventEndTime	Tag 1496	Y	Moment when the fixed length of the Price Improvement Period ends.	End Time

12.0 “CPI Notice” message (HSVF)

This message is used to notify to the market that a CPI Request has been started, interrupted or cancelled by the system. Transparency of Side, Volume, Price Sign and Price fields is defined at system level by Borsa Italiana.

Field	Size	Type	Notes
Message Header	23		
Exchange ID	1	A	Identifier of the trading venue: “I” for IDEM.
Group Instrument	2	X	Group identifier for the instrument in the CPI Request.
Instrument	4	X	Identifier for the instrument in the CPI Request.
Symbol	30	X	Identification symbol for a strategy.
Side	1	X	Side of the Client CPI order - buy or sell (it will be empty in case dissemination of this information is disabled by Borsa Italiana).
Volume	8	X	Pre-Agreed quantity of the CPI Request (it will be empty in case dissemination of this information is disabled by Borsa Italiana).
Price Sign	1	X	Sign (+/-) for field “Price”.
Price	8	X	Pre-Agreed price of the CPI Request (it will be empty in case dissemination of this information is disabled by Borsa Italiana).
CPI Status	1	X	Describes the reason for the dissemination of the NR message.
CPI Proposal ID	8	X	Unique identifier of the CPI Request (per instrument).
Start Time	12	N	Moment when the Price Improvement Period starts (Time stamp: HHMMSSmmuuu).
End Time	12	N	Moment when the fixed length of Price improvement Period ends (time stamp: HHMMSSmmuuu).