S.M.A.R.T. HUBECN INTRODUCTION

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This document contains a general information on Real-time *S.M.A.R.T.* HUBECN™ System

I.   GENERAL INFO.

1. **HUBECN™ ABC** system is a full turn-key solution to operate any type of a Brokerage and/or Exchange.
   ABC means capability of:
   "A"- managing **A-Book;**
   "B"- managing **B-Book**;
   "C"- managing a combination of **"A" & "B"-Books**.
   HUBECN™ ABC platform consists of the following software parts, all written in a generic "C" program language:
   - BBO Engine
   - Order Matching & Processing Engine
   - FIX Engine with FIX API
   - Web Server

2. **HUBECN™ BBO (Best Bid and Offer Order Routing and Matching Engine)** implementation on a server side represents NDB/LMAX type FIX style. It uses codes for currencies, commodities, derivatives, metals, oil products, crypto products and   other desired tradable instruments.
BBO Engine is capable to be connected to FIX API or any other type of API provided by exchanges, banks, prime brokers and desired Liquidity Providers.
Default version of HUBECN™ BBO includes pre-built FIX connection to LMAX, Currenex, AMI, Atlas ATS servers and able to listen on local ports 9876 (trade) and 9875 (quotes) as FIX server. As client, it is able to establish a basic session and listen to the depth of the book quotes.
Beyond mentioned FIX exchanges, it is able to connect to ItBit, BTC-e and Bitstamp bitcoin exchanges via their respective REST type protocols. When BBO receives a market order, the order is routed to the expected Best Bid/Ask price provided by the exchange for the given quantity. If there is not enough of liquidity at the best price from one liquidity provider, the order is split in the way that the best expected price for execution is achieved.
If one of the liquidity providers cancels the order, the cancelled part is re-routed to remaining liquidity providers.
BBO also generates "order accepted" after receiving next order and "order executed" messages as the order is (maybe partially) executed.

3. **HUBECN™ Match** engine is used for the "Exchange Type" operation and allows matching clients Limit and Market orders. This   creates a unique opportunity to provide trading by Matching clients orders 24 hours a day, 7 days a week.
   Limit orders are stored within BBO and executed against a matched market order or routed to the desired LP in form of:
 3.a. Limit Order or
 3.b. Market order, when a quote from this LP matches the price.
    HUBECN™ BBO has a persistent Limit Order storage & possibility to toggle symbols being routed to LP or to stay in BBO.

4. **HUBECN™ FIX** Engine with FIX API allows any third party to be connected to HUBECN™ ABC platform receiving prices and   processing Market and Limit orders.
For trading Crypto Currencies (BTC/Bitcoins), new codes are used as well as a different coding of quantities. For standard currencies quantities, when used in FIX messages, they are divided by 10000.
For BTC based pairs, the quantity has to be multiplied by 10. This means that if you need to buy 0.01 BTC/USD, your FIX message will contain 0.1, i.e. the corresponding part of the FIX message will be "38=0.1".

Current HUBECN™ ABC implementation:
4.a. Provides the full depth of the book quotes.
4.b. MARKET and LIMIT orders are supported.

5. **HUBECN™ WEB Server** allows using browser-based Risk Management GUI on any device with any type of the operating system having a browser; this includes smart phones.

II. CONTENT.

This directory contains following files:
1. **INTRODUCTION:**   **This file**
2. **IMPLEMENTED INSTRUMENTS:** **List of symbol codes doc**
3. **FIX-MarketData-API.html:**   **Quotes protocol doc**
4. **FIX-Trading-API.html:**   **Trading protocol doc**
5. **FIX-Implementation Examples:** **Example cases doc**

III. THIRD PARTY SYSTEM CONNECTIVITY.

HUBECN™ BBO Engine outputs connectivity to 3rd party trading systems through BBO FIX API.

Multiple and any type of 3rd party trading systems can be connected to the same BBO Instance via HUBECN™ FIX API.

MetaTrader MT4 Server connectivity, besides FIX API, is performed via in-house developed MT4 FIX Bridge. The live connection will require SSL (i.e. Secure Socket Layer), which is an encryption used to secure the connection.

For the Risk Management efficiency our MT4 FIX Bridge recognizes Clients MT4 Account IDs, while orders are transferred to BBO Engine for the execution.

HUBECN™ BBO Engine has a persistent limit order storage & possibility to toggle symbols to be routed to LP or to stay in BBO.

IV. HUBECN™ BROWSER BASED RISK MANAGEMENT GUI.

HUBECN™ Risk Management Terminal functionality includes multiple modules allowing instantly managing the risk, providing capabilities to instantly adjust settings, change required parameters without restarting the entire engine.

Inverted spreads are displayed in "Peach" color.

HUBECN™ Risk Management Terminal is secured browser-based Graphical User End. It is a complete Risk Management application, which can be launched even on any smart phone that creates a convenient back up option to manage business via the phone. It consists of the several important parts with the corresponding functionality described below:

1. Horizontal **"Main Menu"**

| Trading OFF | RM OFF | Offset On | Offset Off | Fok | Restart | | Main | BS | RM | Routing | Reports | Messages | Limit | Trade | Logout | | Version 1.94 | Demo | 22:01:24 |
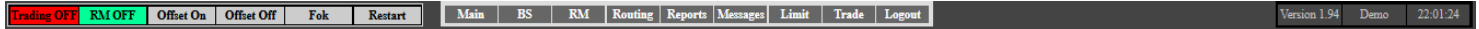
1.a. "Trading ON/OFF" instantly enables and disables Order Straight Through Processing to the BBO Engine.

1.b. "RM ON/OFF" turns customized Risk Management (See RM, Point 1.h.) ALGO ON and OFF

1.c. "Offset ON/OFF" Instantly turns automatic Order Straight Through Processing to the Liquidity Providers

1.d. "FOK" turns ON and OFF order "Fill or Kill" functionality

1.e. "Restart" button restarts the entire BBO Engine on the server side

1.f. "Main" displays the main screen of the Risk Management GUI

1.g. "BS" displays a complete screen of the Instrument based risk management "Blotter Summary" (See. Point IV.5) and allows to see it w/o scrolling

Inst	Market	SAmt	AvgSell	BAmt	AvgBuy	Ofst P/L	MM Amt	MM Avg	MM P/L	Total P/L	
XPT	N/A	0.30	1249.50			0	0.30	1249.50	0	0	Day
XPD	N/A	0.10	782.80			0	0.10	782.80	0	0	Week
Gold	N/A	0.10	1168.30			0	0.10	1168.30	0	0	Month
USD/JPY	N/A	0.00	121.410			0	0.00	121.410	0	0	Year
USD/CHF	N/A			2.00	0.98318	0	2.00	0.98318	0	0	
USD/CAD	N/A	0.00	1.13235			0	0.00	1.13235	0	0	User
NZD/JPY	N/A	14.00	92.215	14.00	92.246	0			0	0	Clear
GBP/USD	N/A			109.57	1.57197	0	109.57	1.57197	0	0	
GBP/CAD	N/A	4.00	1.78639	3.00	1.78708	0	1.00	1.78535	0	0	
EUR/USD	N/A	259.12	1.18946	258.00	1.18893	0	1.12	1.17917	0	0	
EUR/GBP	N/A	0.10	0.79211			0	0.10	0.79211	0	0	
BTC/USD.c	277.77	1.99	372.14	1.00	286.99	0.00	0.99	372.14	93.43	93.44	
BTC/USD	277.75	2,319.98	410.53	671.00	291.00	9.62	1,648.98	400.79	202,886.09	202,895.72	
BTC/JPY	33860			9.90	49539	0	9.90	49539	-155,228.66	-155,228.66	
BTC/EUR	241.49			4,220.00	436.27	0	4,220.00	436.27	-821,937.58	-821,937.58	
BTC/CAD	339.23			9.00	511.41	0	9.00	511.41	-1,549.55	-1,549.55	

1.h. "RM" displays current Positions and "Algorithmic Risk Management" screen with the corresponding ALGO settings

Currency Positions:

| BTC | 2,588. | CAD | 174,475. | CHF | -196,636. | EUR | -1,963,825. | GBP | 10,866,338. | JPY | -433,746. | USD | -16,226,952. | C-Gold | -1. | C-XPD | -1. | C-XPT | -3. |

Limit Order Rules:
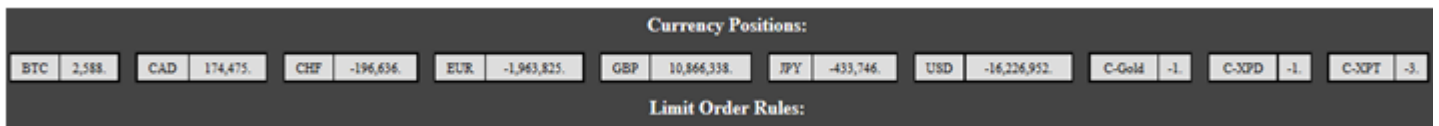
1.i. "Routing" tab activates Liquidity Connectivity Screen.

Settings allow to:

- Activate and Deactivate Liquidity A and B books
- Change Liquidity routing settings and **manage the A-Book** at the level of Buy and Sell sides of each tradable instrument in combination with desired Liquidity Sources
- Change Liquidity routing settings and **manage the B-Book** at the level of Buy and Sell sides of each tradable instrument
- Change Liquidity routing settings and **manage the combination of A & B-Books (C-Book,** See Point I.1**)** at the level of Buy and Sell sides of each tradable instrument in a combination with desired Liquidity Sources

In addition to the **Routing** screen to mange connected Liquidity Sources, HUBECN™ A/B/C system provides **"Config"** file, with the settings allowing to assign users to the specific Liquidity Groups with the specific rules managing Liquidity Sources connectivity.

Symbol	Self execution		LMX (CFXLP1)		CPM (CFXLP2)		AMI (CFXLP3)		TLT (CFXLP4)		LMX (caufex)		BTCE (CFXLP5)		BTSTMP (CFXLP6)		HSS (CFXLP7)		HS (CFXLP8)		ATL (CFXLP9)		BBOReal (CFXLP10)		ITBIT (CFXLP11)	
	Buy	Sell	Buy	Sell	Buy	Sell	Buy	Sell	Buy	Sell	Buy	Sell	Buy	Sell	Buy	Sell	Buy	Sell	Buy	Sell	Buy	Sell	Buy	Sell	Buy	Sell
BTC/CAD	✓	✓																								
BTC/CNY	✓	✓																								
BTC/EUR	✓	✓																								
BTC/GBP	✓	✓																								
BTC/JPY	✓	✓																								
BTC/SGD	✓	✓																								
BTC/USD	✓	✓																								
XBT/USD	✓	✓																								
BTC/USD.c	✓	✓																							✓	✓
BTC/EUR.c	✓	✓																							✓	✓
BTC/SGD.c	✓	✓																							✓	✓
BTC/USD.atl	✓	✓																			✓	✓				
BTC/EUR.atl	✓	✓																			✓	✓				
BTC/SGD.atl	✓	✓																			✓	✓				
AUD/CAD	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓					✓	✓	✓	✓				
AUD/CHF	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓					✓	✓	✓	✓				
AUD/JPY	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓					✓	✓	✓	✓				
AUD/NZD	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓					✓	✓	✓	✓				
AUD/USD	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓					✓	✓	✓	✓				
CAD/CHF	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓					✓	✓	✓	✓				
CAD/JPY	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓					✓	✓	✓	✓				
CHF/JPY	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓					✓	✓	✓	✓				
EUR/AUD	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓					✓	✓	✓	✓				
EUR/CAD	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓					✓	✓	✓	✓				
EUR/CHF	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓					✓	✓	✓	✓				
EUR/CZK	✓	✓	✓	✓																						

1.j. "Reports" displays customized reports for any of connected Liquidity Source and/or B2B Client and their transactions.

Provides an access to the daily transactional reporting system at the level of every single Liquidity Provider and every single trading system (MetaTrader, J-Trader, etc.) connected to HUBECN™ ABC Engine via HUBECN™ FIX API.

Source: Journal File | Date: 2014-10-10 | User: ALL | Symbol: ALL | Export: Save as CSV | Update: Update Page

Date	Time	Order Id	User	Exchange	Instr	Side	Traded Q	ExePrc	Opn Q	AvgPrc	Cls Q	Grs P/L (Q)	Grs P/L ($)	Com ($)	Net P/L ($)	Balance ($)
10/10/2014	00:02:16	16:54328d57000040f8	CFXLP4	TLT	EUR/GBP	B	0.10	0.78695			0.10	1.10000	1.77309	-0.63446	1.13863	343,230.13146
10/10/2014	00:02:16	16:54328d57000040f8	exchangegate2	BBO	EUR/GBP	S	0.10	0.78695	0.10	0.78695						-983,654.83335
10/10/2014	00:10:13	16:54328d57000040fa	CFXLP4	TLT	GBP/USD	S	1.19	1.61232	1.19	1.61224						343,230.13146
10/10/2014	00:10:13	16:54328d57000040fa	exchangegate2	BBO	GBP/USD	B	1.19	1.61232			1.19	9.59992	9.59992	17.41333	27.01325	-983,654.83335
10/10/2014	00:11:00	16:54328d57000040fd	CFXLP4	TLT	GBP/USD	S	1.80	1.61247	1.80	1.61242						343,230.13146
10/10/2014	00:11:00	16:54328d57000040fd	exchangegate2	BBO	GBP/USD	B	1.80	1.61247			1.80	9.00000	9.00000	26.12021	35.12021	-983,654.83335
10/10/2014	00:11:49	16:54328d57000004100	CFXLP7	HSS	EUR/GBP	S	0.09	0.78711	0.09	0.78703						3,092,052.08578
10/10/2014	00:11:49	16:54328d57000004100	exchangegate2	BBO	EUR/GBP	B	0.09	0.78711			0.09	0.79992	1.28983	1.14192	2.43175	-983,651.59546
10/10/2014	00:14:42	16:54328d57000004102	CFXLP4	TLT	GBP/USD	S	2.69	1.61275	2.69	1.61270						343,230.13146
10/10/2014	00:14:42	16:54328d57000004102	exchangegate2	BBO	GBP/USD	B	2.69	1.61275			2.69	13.49995	13.49995	39.18017	52.68012	-983,651.59546
10/10/2014	00:15:53	16:54328d57000004105	CFXLP4	TLT	EUR/GBP	B	0.10	0.78698			0.10	0.50000	0.80616	-0.63446	0.17170	343,230.13146
10/10/2014	00:15:53	16:54328d57000004105	exchangegate2	BBO	EUR/GBP	S	0.10	0.78698	0.10	0.78698						-983,651.59546
10/10/2014	00:15:54	16:54328d57000004107	CFXLP4	TLT	EUR/GBP	S	0.10	0.78709	0.10	0.78703						343,225.30492
10/10/2014	00:15:54	16:54328d57000004107	exchangegate2	BBO	EUR/GBP	B	0.10	0.78709			0.10	0.60000	0.96740	1.14203	2.10943	-983,648.19616
10/10/2014	00:16:12	16:54328d57000004109	CFXLP7	HSS	EUR/GBP	B	0.10	0.78706			0.10	-0.30000	-0.48372	-0.63446	-1.11818	3,092,052.08578
10/10/2014	00:16:12	16:54328d57000004109	exchangegate2	BBO	EUR/GBP	S	0.10	0.78706	0.10	0.78705						-983,648.19616
10/10/2014	00:16:13	16:54328d5700000410b	CFXLP7	HSS	EUR/GBP	B	0.10	0.78706			0.10	-0.10000	-0.16124	-0.63446	-0.79570	3,092,052.08578
10/10/2014	00:16:13	16:54328d5700000410b	exchangegate2	BBO	EUR/GBP	S	0.10	0.78706	0.10	0.78705						-983,648.19616
10/10/2014	00:17:23	16:54328d5700000410d	CFXLP7	HSS	EUR/GBP	S	0.09	0.78713	0.09	0.78709						3,092,033.87689
10/10/2014	00:17:23	16:54328d5700000410d	exchangegate2	BBO	EUR/GBP	B	0.09	0.78713			0.09	0.39996	0.64493	1.14192	1.78685	-983,645.60314
10/10/2014	00:19:23	16:54328d5700000410f	CFXLP7	HSS	EUR/GBP	S	0.09	0.78715	0.09	0.78711						3,092,015.99250
10/10/2014	00:19:23	16:54328d5700000410f	exchangegate2	BBO	EUR/GBP	B	0.09	0.78715			0.09	0.39996	0.64485	1.14192	1.78677	-983,643.33272
10/10/2014	00:20:34	16:54328d5700000040ff	CFXLP4	TLT	GBP/USD	B	1.80	1.61185	1.37	1.61185	0.42	35.85640	35.85640	-3.40078	32.45562	343,198.19369
10/10/2014	00:20:34	16:54328d5700000040ff	exchangegate2	BBO	GBP/USD	S	1.80	1.61185	0.42	1.61185	1.37	0.00000	0.00000	19.99879	19.99879	-983,592.01251
10/10/2014	00:22:46	16:54328d57000004111	caufex	LMX	EUR/GBP	B	0.10	0.78745			0.10	-3.40000	-5.48063	-0.63446	-6.11509	144,749.73966
10/10/2014	00:22:46	16:54328d57000004111	exchangegate2	BBO	EUR/GBP	S	0.10	0.78745	0.10	0.78742						-983,592.01251
10/10/2014	00:22:50	16:54328d57000004113	CFXLP4	TLT	EUR/GBP	S	0.09	0.78753	0.09	0.78747						343,200.46043

1.k. "Messages" displays Server Side System Logs including connectivity issues of all connected Liquidity Sources. Orders being processed with the corresponding prices, amounts, their routing Liquidity destinations and confirmed execution status.

```
2015-01-12 00:00:48.926 953: FIX: Login accepted for exchangegate2 from ▓▓▓▓▓▓ (socket 15)
2015-01-12 00:00:50.719 397: Connection accepted from ▓▓▓▓▓▓▓▓ ▓▓ ▓ (BBO) to socket 16
2015-01-12 00:00:50.981 042: FIX: Login accepted for exchangegate1 from ▓▓▓▓▓▓ (socket 16)
2015-01-12 00:45:14.208 656: fixPeriodicCheckOfConnections: not yet implemented
2015-01-12 00:45:34.145 468: gethostbyname: api.itbit.com --> ▓▓▓▓▓▓

2015-01-12 01:41:16.350 810: Received new market order exchangegate2 754947 54b3263c00000001: SELL 5.00 * EUR/USD.
2015-01-12 01:41:16.350 810: Split:      SELL 5.00 --> HSS;
2015-01-12 01:41:16.450 155: Order accepted HSS bbo_46187147: SELL 5.00 * EUR/USD
2015-01-12 01:41:16.452 744: Order execution HSS OT_MARKET bbo_46187147: SELL 5.00 * EUR/USD: EXECUTED 5.00 @ 1.18621
```

1.l. "Limit" displays all Limit Orders stored in the system including Persistent Storage

Submit New Order

Buy ∨ 0.01   EUR/USD ∨ at 1.24   route to BBO ∨ Time in Force GTC ∨ Submit

Verify Orders

Current Orders

	User	Account	Time	Id	Instrument	Side	ExAmount	RemAmount	Price	TIF	Routed to
	Risk Manager		Tue Jan 6 21:18:16 2015	_BBO__bbo_46186930	BTC/USD	Buy		0.01	1.24	GTC	BBO (as _BBO__bbo_46186931)
Unverified	exchangegate2	754819	Thu Oct 2 03:10:05 2014	542bcde700001e13	GBP/USD	Sell		0.50	1.62538	GTC	BBO (as bbo_46186502)
Unverified	exchangegate2	754819	Thu Oct 2 03:35:57 2014	542bcde700001fdd	GBP/USD	Sell		9.30	1.62454	GTC	BBO (as bbo_46186505)
Unverified	exchangegate2	754819	Thu Oct 2 05:54:31 2014	542bcde70000226a	GBP/USD	Sell		2.70	1.62377	GTC	BBO (as bbo_46186506)
Unverified	exchangegate2	754849	Thu Nov 27 12:35:12 2014	5453ad1f00027bab	AUD/USD	Sell		8.00	0.88125	GTC	BBO (as bbo_46186501)
Unverified	exchangegate2	754819	Sun Nov 30 23:24:07 2014	5453ad1f000292fb	AUD/USD	Sell	1.00	7.00	0.85698	GTC	BBO (as bbo_46186503)
Unverified	exchangegate2	753777	Wed Dec 3 10:13:35 2014	5453ad1f000294ad	AUD/USD	Sell		8.00	0.86244	GTC	BBO (as bbo_46186500)
Unverified	exchangegate2	753777	Wed Dec 3 10:14:20 2014	5453ad1f000294b4	AUD/USD	Sell		8.00	0.86085	GTC	BBO (as bbo_46186507)
Unverified	exchangegate2	753777	Thu Dec 4 07:45:26 2014	5453ad1f000294ce	AUD/USD	Sell		8.00	0.85941	GTC	BBO (as bbo_46186504)
O.K.	exchangegate2	754947	Mon Jan 12 02:04:39 2015	54b3263c00000011	GBP/USD	Buy		3.00	1.51626	GTC	BBO (as bbo_46187160)

1.m. "Trade" displays "Reconciliation Trade" window allowing manual Trading and Manual Position Reconciliation.

Reconciliation Trade

EUR/USD ∨

Exchange	Account	Position	Trade Side	Amt to Trade
LMX	CFXLP1		Buy ∨	
CPM	CFXLP2	-738.59	Buy ∨	
AMI	CFXLP3		Buy ∨	
TLT	CFXLP4	2,470.05	Sell ∨	
LMX	caufex	273.42	Sell ∨	
BTCE	CFXLP5		Buy ∨	
BTSTMP	CFXLP6		Buy ∨	
HSS	CFXLP7	-145.79	Buy ∨	
HS	CFXLP8		Buy ∨	
ATL	CFXLP9		Buy ∨	
BBOReal	CFXLP10		Buy ∨	
ITBIT	CFXLP11		Buy ∨	

Cancel   Submit

1.n. "Logout" tab is used to Logout from the GUI

2. BBO **Incoming "LP Order Depth of the Book"** allows to watch Depth of the Market in a combination of incoming data feed and available quantity. Window w/ **Instrument "Drop Down" Menu** and "**Q**" space to enter desired Order Quantity.

SELL side of the book is displayed in **Blue color** and **BUY sid**e of the book in **Pink color**

This window also incorporates:

Sell and Buy order submission includes Book Swap for every single tradable instrument; this is required for the A-book reconciliation and B-Book management

2.a. "BUY" & **"SELL" buttons** for Manual Order Submission

2.b. "BUY Book Swap" and **"SELL Book Swap" buttons** to Manual whole Book Swap

	EUR/USD ⌄		Q:		EUR/USD.hs ⌄		Q:		BTC/USD ⌄		Q:
	Price	**Amt**	**Source**		**Price**	**Amt**	**Source**		**Price**	**Amt**	**Source**
Book Swap	1.34413	35.00	LMX	Book Swap	1.34416	135.00	HS	Book Swap	571.98	0.01	BTCE
	1.34413	200.00	HSS		1.34415	365.00	HS		571.60	0.19	BTCE
	1.34412	2.00	LMX		1.34414	170.00	HS		570.70	0.25	BTCE
BUY	1.34412	110.00	HSS	BUY	1.34413	200.00	HS	BUY	570.50	0.05	BTCE
	1.34411	4.60	LMX		1.34412	110.00	HS		570.50	0.40	BTCE
SELL	1.34418	10.00	TLT	SELL	1.34410	30.00	HS	SELL	582.15	1.46	BTSTMP
	1.34416	10.00	TLT		1.34409	155.00	HS		582.13	0.58	BTSTMP
	1.34412	56.00	CPM		1.34408	95.00	HS		581.13	5.40	BTSTMP
Book Swap	1.34411	34.00	CPM	Book Swap	1.34407	220.00	HS	Book Swap	581.10	0.12	ATL
	1.34410	30.00	HSS		1.34406	310.00	HS		581.00	0.28	BTSTMP

3. BBO Outgoing "Quoting Order Depth of the Book" allows to watch Bid & Offer prices consisted of the combination of prices received from Liquidity Providers and Clients Limit Orders with the corresponding amounts

Quoting Order Book				**Quoting Order Book**				**Quoting Order Book**		
1.34415	402.00	-		1.34416	135.00	HS		578.36	0.01	-
1.34414	205.05	-		1.34415	365.00	HS		577.97	0.19	
1.34413	235.00	-		1.34414	170.00	HS		577.07	0.25	
1.34412	112.00	-		1.34413	200.00	HS		576.88	0.05	
1.34411	4.60	LMX		1.34412	110.00	HS		576.87	0.40	
1.34418	10.00	TLT		1.34410	30.00	HS		575.77	1.46	
1.34416	10.00	TLT		1.34409	155.00	HS		575.75	0.58	
1.34412	56.00	CPM		1.34408	95.00	HS		574.75	5.40	-
1.34411	34.00	CPM		1.34407	220.00	HS		574.72	0.12	
1.34410	35.00	-		1.34406	310.00	HS		574.62	0.28	-

4. "Liquidity Connectivity" and **"Account Position Blotter"** with:

4.a. "Liquidity Management" Financial Blotter with Check Boxes allows to Customize and Manage (activate and deactivate) Liquidity lines and B2B platforms connected to the HUBECN™ Engine. Access to the real time Financial Information, such as Balance, Equity, Used Margin, Usable Margin, Gross/Net P/L, Margin Call of every single Liquidity Provider and B2B client (trading system) connected to HUBECN™ Engine via HUBECN™ FIX API.

	Acc Name	Exchange	Acc Curr	Balance	Equity	UsdMrg	UsblMrg	Grs P/L	Net P/L	MrgCall
☑	CFXLP1	LMX	USD	1,000,000.00	1,000,000.00	0.00	100,000,000.00	0.00	0.00	
☑	CFXLP2	CPM	USD	999,995.26	999,972.79	13,441.10	99,983,838.41	-21.80	-22.47	
☐	CFXLP3	AMI	USD	1,000,000.00	1,000,000.00	0.00	100,000,000.00	0.00	0.00	
☑	CFXLP4	TLT	USD	1,036,666.81	1,156,306.19	19,449,290.03	96,181,329.85	120,611.80	119,639.38	
☑	caufex	LMX	USD	954,660.86	793,779.03	34,441,097.92	44,936,805.29	-159,159.61	-160,881.83	
☑	CFXLP5	BTCE	USD	0.00	0.00	0.00	0.00	0.00	0.00	
☑	CFXLP6	BTSTMP	USD	0.00	0.00	0.00	0.00	0.00	0.00	
☑	CFXLP7	HSS	USD	828,278.53	1,020,593.52	24,579,773.61	77,479,578.85	193,544.10	192,314.98	
☑	CFXLP8	HS	USD	200,557,418.56	200,557,339.01	310,278.30	20,055,423,623.62	-64.02	-79.54	
☑	CFXLP9	ATL	USD	0.00	0.00	0.00	0.00	0.00	0.00	
	Risk Manager		USD	184,221.92	184,154.61			-67.31		
	exchangegate1	DDO	USD	-6,273,448.53	-6,239,045.79	13,270,933.50	610,633,646.13	33,207.35	34,402.73	
	SGTMT4	BBO	USD	-100,000,000.00	-100,000,000.00	0.00	10,000,000,000.00	0.00	0.00	
	atm	BBO	USD	-100,000,000.00	-100,000,000.00	0.00	100,000,000.00	0.00	0.00	
	sat1	BBO	USD	0.00	0.00	0.00	0.00	0.00	0.00	
	BBO Totals [USD]			103,571.51	288,944.77	65,522,947.47	9,863,371,529.91	188,117.82	185,373.26	

4.b. "Liquidity & Client Account Summary" After clicking on the specific LP and/or B2B client row, corresponding "Account Position" drop down Report appears.

BTC/JPY	B	9.90	49539	26784	49538	-225,280.96	-225,267.59	$-1,914.09
BTC/USD	S	1,669.00	398.91	232.60	398.92	277,579.51	277,598.64	$277,598.64
BTC/USD.c	B	4.41	197.32	227.98	197.12	135.20	136.07	$136.07
AUD/CAD	B	0.10	0.96897	0.98177	0.96892	128.00	128.49	$103.51
AUD/USD	B	7.60	0.82844	0.79080	0.82840	-28,606.40	-28,576.30	$-28,576.30
CAD/CHF	B	1.70	0.84126	0.70547	0.84122	-23,084.30	-23,078.31	$-26,380.94
EUR/AUD	B	2.00	1.44243	1.42400	1.44235	-3,686.00	-3,671.81	$-2,903.45
EUR/GBP	S	14.90	0.79571	0.74982	0.79574	68,377.33	68,433.14	$102,700.35
EUR/JPY	B	0.40	143.918	132.440	143.912	-459,170.27	-458,905.51	$-3,899.30
EUR/USD	S	2,629.71	1.23960	1.12528	1.23965	30,062,864.15	30,077,631.42	$30,077,631.42
GBP/JPY	S	5.00	182.019	176.602	182.028	2,708,775.00	2,713,193.76	$23,055.10
GBP/USD	B	1,103.77	1.56705	1.50074	1.56697	-7,319,147.93	-7,310,872.15	$-7,310,872.15
NZD/JPY	B	33.50	92.494	87.792	92.490	-15,754,748.50	-15,739,998.94	$-133,742.31
USD/CAD	B	16.09	1.10195	1.24136	1.10188	224,449.96	224,549.85	$180,901.85
USD/CHF	S	3.40	0.96178	0.87456	0.96182	29,654.80	29,669.64	$33,925.22
USD/JPY	S	5.60	118.400	117.683	118.405	401,520.00	404,820.35	$3,439.92
Gold	S	33.10	1234.25	1284.56	1234.31	-16,652.32	-16,630.87	$-16,630.87
Silver	S	26.50	17.385	18.112	17.386	-19,243.50	-19,219.31	$-19,219.31
UK-Brent	B	0.90	86.01	49.74	86.01	-3,264.91	-3,264.69	$-3,264.69
US-Crude	B	93.00	96.18	46.42	96.18	-462,810.03	-462,788.69	$-462,788.69
XPD	S	18.10	795.57	763.30	795.61	5,842.15	5,849.14	$5,849.14
XPT	B	5.20	1277.13	1269.60	1277.07	-391.79	-388.48	$-388.48

Access Position information for each Liquidity Provider and B2B client (trading system) connected to HUBECN™ BBO via HUBECN™ FIX API. Open Position screen automatically appears right after clicking on the row of the desired Liquidity Source or B2B Client.

5. Risk management **"Position Blotter".** Access to real-time Risk Management Blotter including Average Buy and Sell prices, amounts, Mark-to-Market (MM) amounts, MM prices and MM P/L.

Inst	Market	SAmt	AvgSell	BAmt	AvgBuy	Ofst P/L	MM Amt	MM Avg	MM P/L	Total P/L		
XPT	N/A	0.30	1249.50			0	0.30	1249.50	0	0		Day
XPD	N/A	0.10	782.80			0	0.10	782.80	0	0		Week
Gold	N/A	0.10	1168.30			0	0.10	1168.30	0	0		Month
USD/JPY	N/A	0.00	121.410			0	0.00	121.410	0	0		Year
USD/CHF	N/A			2.00	0.98318	0	2.00	0.98318	0	0		User
USD/CAD	N/A	0.00	1.13235			0	0.00	1.13235	0	0		
NZD/JPY	N/A	14.00	92.215	14.00	92.246	0			0	0		Clear

6. Risk management **"Feed Control Panel".** Feed Control Panel window with:
6.a. *Lean* allows shifting of the price feed of both- Bid and Ask to the left (in case of entering "- figure") and to the right (in case of entering "+figure") in the corresponding field for each tradable instrument in a "Lean" column.
6.b. *Shift Bid* allows independent shifting of a "Shift Figure" to the "Left" and "Right" the same way as described in Point a.
6.c. *Shift Ask* allows independent shifting of a "Shift Figure" to the "Left" and "Right" the same way as above.

"Feed Control Panel" window with "0" value entered in "Shift Bid", "Shift Ask and "Lead' columns displays the original "Incoming" data feed received from the LPs, managed by the BBO engine and distributes the outgoing feed (original or modified) to the users through BBO FIX API.

					ShiftBid	Bid	Instrument	Ask	ShiftAsk							Lean
-10	-7	-5	-3	-1	0	326.25	BTC/CAD	322.49	0	+1	+3	+5	+7	+10	0
-10	-7	-5	-3	-1	0	0.74726	EUR/GBP	0.74733	0	+1	+3	+5	+7	+10	0
-10	-7	-5	-3	-1	0	8.73880	EUR/HKD	8.73982	0	+1	+3	+5	+7	+10	0
-10	-7	-5	-3	-1	0	310.950	EUR/HUF	311.232	0	+1	+3	+5	+7	+10	0

7. Risk management **"Transactional Blotter"** with the instrument-based **"Reconciliation"** button. Allows access to the real time Transactional Position Blotter showing open positions for each tradable instrument. Access Position Reconciliation Trading capabilities automatically showing default amounts due to be reconciled

		BTC/CAD	BTC/EUR	BTC/JPY	BTC/USD	BTC/USD.c	AUD/CAD	AUD/JPY	AUD/NZD	AUD/USD	CAD/CHF	CAD/JPY	CHF/JPY	EUR/AUD	EUR/CAD	EUR/CHF	EUR/CZK	EUR/GBP	EUR/JPY	EUR/USD	GBP/AUD	GBP/CAD	GBP/JPY	GBP/USD	NZD/JPY	NZD/USD	USD/CAD	USD/CHF	USD/JPY	Gold	Silver	UK-Brent	US-Crude	XPD	XPT
LMX	CFXLP1																																		
CPM	CFXLP2						-3.00			-5.80				-0.20	-0.03			-31.50	18.99	-738.59	-1.00			-143.35	2.00	-31.59	2.20	-8.00							
AMI	CFXLP3																																		
TLT	CFXLP4				-0.10			2.00	37.00					-2.00	5.00	-8.00			3.10	2,470.05				-3,042.96			14.00	12.60	0.10						
LMX	caufex				1.00		-0.20	3.00	-2.00	14.90	-0.70		1.04	0.10	0.03	8.00	1.00	59.68	-18.50	273.42			5.90	1,296.38	-33.50	-2.00	2.51	6.30	7.10	33.00	26.50	-0.90	-93.00	18.00	-5.50
BTCE	CFXLP5																																		
BTSTMP	CFXLP6																																		
HSS	CFXLP7						0.20			-51.70		1.00	-1.04	0.10	-2.00			6.72	-0.90	-143.80				898.73			-1.00	-15.70	6.39						
HS	CFXLP8																																		
ATL	CFXLP9																																		
BBOReal	CFXLP10																																		
ITBIT	CFXLP11																																		
BBO	exchangegate1																																		
BBO	exchangegate2	9.00	4,220.00	9.90	-1,649.00	-0.99	0.10			6.60	1.70			2.00				-14.90	0.40	-2,629.81			-5.00	1,100.77	33.50		16.09	-3.40	-5.60	-33.10	-26.50	0.90	93.00	-18.10	5.20
BBO	mt4sync																																		
BBO	user																																		
BBO	QA1																																		
BBO	QA2																																		
BBO	QA3																																		
BBO	QA4																																		
BBO	QA5																			1.00			-1.00												
BBO	SGTMT4																																		
BBO	atm																			3.00															
BBO	sat1																																		
BBO	development				-0.98					-1.00	-1.00	-1.00			-3.00			-1.00	-23.20	763.61	1.00		-0.90				-0.01								
ITBIT	CFXLP11																																		
Total		9.00	4,220.00	9.90	-1,648.98	-0.99												-0.10		-1.12			-1.00	109.57			-0.00	2.00	-0.00	-0.10				-0.10	-0.30