

AES[®] Equities Global FIX Specification Document

1. Overview – What's New

One Global Equities Spec for Buy & Sell Side

We have officially retired the BD+ brand and folded the broker dealer spec into this new global AES spec.

For those of you unaware the broker dealer spec, we originally offered a subset of our AES strategies eschewing the premier dark algo's for more traditional time/slice tactics.

Later on we offered our BD clients the same dark tactics (i.e., Guerrilla & Sniper), which diminished the need for separate specs and branding.

We are now offering a global consolidated algo suite to the buy and sell-side alike, with the same functionality and branding. For instance, in the broker dealer world, INLINE would be known as WORK-IT. Going forward, we will only recognize the AES branded strategy names, so in the example referenced above we would only know INLINE. For our broker dealer vendors, I will provide a mapping of names, so that they can make the necessary changes on the front-end.

Brave New World of Cross Currency

We are also rapidly expanding our ability to trade into any market and settle in any currency.

To that end, we will include new cross-currency fields that will be supplemental to our standard offering. These new fields are standard FIX, not user defined tags like our 606X fields. The idea behind this was to shorten time to market by not re-inventing the wheel with user defined tags. Having said that, we are not looking to clutter our ticket, so these added fields would not be expected or required on our AES ticket.

We believe these new fields would be best applied by the user before they selected the broker code or strategy. How they are applied, we will leave up to the developers of the GUI's to determine what makes sense organically.

Buy & Sell Side Tactics

This specification documents the required changes necessary to provide access to Credit Suisse's new algorithmic offering – AES.

The following trading tactics will be available to buy and sell side:

- | | | | |
|----------|-----------------|---|------------|
| ■ VWAP | ■ RESERVE | ■ FLT-GUERRILLA | ■ CUSTOM |
| ■ INLINE | ■ FLOAT | ■ SNIPER | ■ CUSTOM 1 |
| ■ TEX | ■ VOLUME INLINE | ■ CROSSFINDER+ | ■ CUSTOM 2 |
| ■ TWAP | ■ IWOULD | ■ PATHFINDER | ■ CUSTOM 3 |
| ■ CLOSE | ■ GUERRILLA | ■ PRE-PO (pre-market/
post market trading) | ■ CUSTOM 4 |

Sell Side Tactics

The following tactic is exclusive to US Sell side clients.

- 10b-18 (Corporate buy back)

BD+ to AES Mapping

BD+ Algo	AES Branded Algo	6061 Value
PATHFINDER	PATHFINDER	9
CROSSFINDER	CROSSFINDER	4A
STRIKE	SNIPER	C
GUERRILLA	GUERRILLA	B
FLT-GUERRILLA	FLT-GUERRILLA	7A
WORKIT IW	I WOULD	D
WORKIT	INLINE	4
VWAP	VWAP	1
TWAP	TWAP	3
TEX	TEX	2
FLOAT	FLOAT	7
RESERVE	RESERVE	6
10b-18	10b-18	2A
PRE-PO	PRE-PO	6A
CLOSE	CLOSE	5
CUSTOM	CUSTOM	8
CUSTOM 1	CUSTOM 1	E
CUSTOM 2	CUSTOM 2	F
CUSTOM 3	CUSTOM 3	G
CUSTOM 4	CUSTOM 4	H
VOLUME INLINE	VOLUME INLINE	A

Implementing Cross Currency

The following tags will be required in the FIX order for eligibility to trade cross currency.

The incoming FIX order can have two additional tags.

TAG	Field Name	Format	Comments
120	SettlCurrency	Char	Settlement currency for Trade (when tag 121 has Y this tag will become mandatory)
121	ForExReq	Char	Y or N To indicate if Cross Currency is required (either Y or N)

The outgoing FIX execution will contain the additional tags below.

TAG	Field Name	Format	Comments
155	SettlCurrFxRate	Float	The FX rate of the fill
156	SettlCurrFxRateCalc	Char	Specifies whether or not SettlCurrFxRate should be multiplied or divided. will be set to M
120	SettlCurrency	Char	Settlement currency
15	Currency	Currency	Trade currency of the order
119	SettlCurrAmount	Amt	Amount in settlement currency

Note: If tags 120 and 121 are not sent in the original FIX order we will settle in local currency.

Enabling AES Ticket

To properly enable these products for trading with Credit Suisse, changes are required in both the user interface and FIX gateway portions of the OMS/EMS placing the order.

1. Product: VWAP, INLINE, TEX, etc
2. Start Time
3. End Time
4. Max% Volume
5. Execution Style (patient, normal, aggressive)
6. Display Size
7. Trigger
8. Rx (not eligible for broker dealer vendors/clients)
9. In/Exclude Auction
10. Min% Volume

AES Enhancements Peripheral to the Ticket

1. GTC (D) orders available across all tactics, except PRE-PO and 10b-18.
2. Storyboard: As part of the AES offering all orders need to be associated with a trader ID, which can be sent in Tags 115/116.
3. The OMS should be able to display the tactic and parameters associated with any given order in the blotter.
4. Display Size is not cancel replaceable, and should be blocked as a field to be modified.
5. RX is not cancel replaceable, and should be blocked as a field to be modified.
6. Custom fields should be editable (i.e., change Custom to Guerrilla aggressive if a client requires this).

FIX Gateway Enhancements

TAG	Field Name	Format	Comments
40	OrderType	Char	Valid values for AES are limited to: 1 = MKT 2 = LMT 3 = Stop (for Pathfinder only) 4 = Stop Limit (for Pathfinder only) 5 = MOC (for Pathfinder only) B = LOC (for Pathfinder only)
59	TimeInForce	Char	Valid values for AES are limited to: 0 = DAY 1 = GTC 2 = OPG 6 = GTD (Good till Date)
126	ExpireTime	Time	Time/Date of order expiration (always expressed in GMT)
120	SettlCurrency	Char	Settlement currency for Trade (when tag 121 has Y this tag will become mandatory)
121	ForExReq	Char	Y or N To indicate if Cross Currency is required (either Y or N)
155	SettlCurrFxRate	Float	The FX rate of the fill
156	SettlCurrFxRateCalc	Char	Specifies whether or not SettlCurrFxRate should be multiplied or divided. will be set to M
120	SettlCurrency	Char	Settlement currency
15	Currency	Currency	Trade currency of the order
119	SettlCurrAmount	Amt	Amount in settlement currency

In addition to established FIX fields, the new order message would include the following:

TAG	Field Name	Format	Comments
6061	ExecServProduct	Char	Valid values: 9 = PATHFINDER 4A = CROSSFINDER+ C = SNIPER B = GUERRILLA 7A = FLT-GUERRILLA D = I WOULD 4 = INLINE 1 = VWAP 3 = TWAP 2 = TEX 7 = FLOAT 6 = RESERVE 2A = 10b-18 6A = PRE-PO 5 = CLOSE 8 = CUSTOM E = CUSTOM 1 F = CUSTOM 2 G = CUSTOM 3 H = CUSTOM 4 A = VOLUME INLINE
6062	StartTime	Time	Order start time as expressed in the executing markets local time in GMT <ul style="list-style-type: none"> Starttime must <Endtime e.g., 20090106-1438:00 = 9:38 EST StartTime must be <EndTime <i>[If blank, AES will default to NOW]</i>
6063	EndTime	Time	Order start time as expressed in the executing markets local time in GMT <ul style="list-style-type: none"> Starttime must <Endtime e.g., 20090106-20:12:00 = 3:12 EST <i>[If blank, AES will default to executing market close time]</i>
6064	MaxPctVolume	Int	Valid Values: 1-99 (only a required field in Volume Inline)
6065	ExecutionStyle	Int	Valid Values: 1-9 Suggested implementation values in dropdown: Patient = 2 Normal = 5 Aggressive = 8
6066	DisplaySize	Int	Not a required field. The value should not be less than 100 shares or over the order qty
6067	MinPctVolume	Int	Valid Values: 1-99
6075	Trigger	Char	Free text with up to 9 characters in a string. GUI's should not validate this field as it is a wild card field
6077	In/Exclude Auction		Int values: 1 = Regional Default 2 = All 3 = Open 4 = Close 5 = None
6083	RX	Char	Valid Value is Rx. Note: this tag is not applicable to BD applications

The following table details field usage for each AES tactic:

ExecServProduct (6061)	Tag	Field Name	Required	Comment
VWAP (1)	6062	Starttime	Optional	Defaults to current time if no time is provided
	6063	Endtime	Optional	Defaults to market close if no time is provided
	6064	MaxPctVolume	Optional	
	6066	DisplaySize	Optional	
	6075	Trigger	Optional	
	6077	In/Exclude Auction	Optional	
	6083	Rx	Optional	Not applicable to BD applications
TEX (2)	6062	StartTime	Optional	Defaults to current time if no time is provided
	6063	Endtime	Optional	Defaults to market close if no time is provided
	6064	MaxPctVolume	Optional	
	6065	ExecutionStyle	Optional	If no value is provided, we default to 5 (normal)
	6066	DisplaySize	Optional	
	6075	Trigger	Optional	
	6077	In/Exclude Auction	Optional	
	6083	Rx	Optional	Not applicable to BD applications
TWAP (3)	6062	Starttime	Optional	Defaults to current time if no time is provided
	6063	Endtime	Optional	Defaults to market close if no time is provided
	6064	MaxPctVolume	Optional	
	6066	DisplaySize	Optional	
	6075	Trigger	Optional	
	6077	In/Exclude Auction	Optional	
	6083	Rx	Optional	Not applicable to BD applications
INLINE (4)	6062	Starttime	Optional	Defaults to current time if no time is provided
	6063	Endtime	Optional	Defaults to market close if no time is provided
	6064	MaxPctVolume	Optional	
	6065	ExecutionStyle	Optional	If no value is provided, we default to 5 (normal)
	6066	DisplaySize	Optional	
	6067	MinPctVolume	Optional	
	6075	Trigger	Optional	
	6077	In/Exclude Auction	Optional	
	6083	Rx	Optional	Not applicable to BD applications
CLOSE (5)	6064	MaxPctVolume	Optional	
	6066	DisplaySize	Optional	
	6075	Trigger	Optional	
	6077	In/Exclude Auction	Optional	
	6083	Rx	Optional	Not applicable to BD applications
RESERVE (6)	6062	Starttime	Optional	Defaults to current time if no time is provided
	6065	ExecutionStyle	Optional	If no value is provided, we default to 5 (normal)
	6066	DisplaySize	Optional	
	6075	Trigger	Optional	
	6077	In/Exclude Auction	Optional	
	6083	Rx	Optional	Not applicable to BD applications
FLOAT (7)	6062	Starttime	Optional	Defaults to current time if no time is provided
	6065	ExecutionStyle	Optional	If no value is provided, we default to 5 (normal)
	6066	DisplaySize	Optional	

FLOAT (7) (cont'd)	6075	Trigger	Optional	
	6077	In/Exclude Auction	Optional	
	6083	Rx	Optional	Not applicable to BD applications
FLT-GUERRILLA (7A)	6062	Starttime	Optional	Defaults to current time if no time is provided
	6064	MaxPctVolume	Optional	
	6065	ExecutionStyle	Optional	If no value is provided, we default to 5 (normal)
	6066	DisplaySize	Optional	
	6067	MinPctVolume	Optional	
	6075	Trigger	Optional	
	6077	In/Exclude Auction	Optional	
	6083	Rx	Optional	Not applicable to BD applications
GUERRILLA (B)	6062	Starttime	Optional	Defaults to current time if no time is provided
	6064	MaxPctVolume	Optional	
	6065	ExecutionStyle	Optional	If no value is provided, we default to 5 (normal)
	6066	DisplaySize	Optional	
	6067	MinPctVolume	Optional	
	6075	Trigger	Optional	
	6077	In/Exclude Auction	Optional	
	6083	Rx	Optional	Not applicable to BD applications
SNIPER (C) * Limit required	6062	Starttime	Optional	Defaults to current time at executing market (GMT)
	6064	MaxPctVolume	Optional	
	6065	ExecutionStyle	Optional	If no value is provided, we default to 5 (normal)
	6066	DisplaySize	Optional	
	6067	MinPctVolume	Optional	
	6075	Trigger	Optional	
	6077	In/Exclude Auction	Optional	
	6083	Rx	Optional	Not applicable to BD applications
VOLUME INLINE (A)	6062	Starttime	Optional	Defaults to current time at executing market (GMT)
	6063	Endtime	Optional	Defaults to market close (GMT)
	6064	MaxPctVolume	Mandatory	
	6065	ExecutionStyle	Optional	If no value is provided, we default to 5 (normal)
	6066	DisplaySize	Optional	
	6067	MinPctVolume	Optional	
	6075	Trigger	Optional	
	6077	In/Exclude Auction	Optional	
	6083	Rx	Optional	Not applicable to BD applications
IWOULD (D)	6062	Starttime	Optional	Defaults to current time if no time is provided
	6063	Endtime	Optional	Defaults to market close if no time is provided
	6064	MaxPctVolume	Optional	
	6065	ExecutionStyle	Optional	If no value is provided, we default to 5 (normal)
	6066	DisplaySize	Optional	
	6067	MinPctVolume	Optional	
	6075	Trigger	Optional	
	6077	In/Exclude Auction	Optional	
	6083	Rx	Optional	Not applicable to BD applications
CROSSFINDER+ (4A)	6062	Starttime	Optional	Defaults to current time if no time is provided
	6063	Endtime	Optional	Defaults to market close if no time is provided

	6064	MaxPctVolume	Optional	
	6065	ExecutionStyle	Optional	If no value is provided, we default to 5 (normal)
	6066	Display Size	Optional	
	6067	MinPctVolume	Optional	
	6075	Trigger	Optional	
	6077	In/Exclude Auction	Optional	
	6083	Rx	Optional	Not applicable to BD applications
PATHFINDER (9)	6062	Starttime	Optional	Defaults to current time if no time is provided
	6066	DisplaySize	Optional	
PATHFINDER (9) (cont'd)	6075	Trigger	Optional	
	6077	In/Exclude Auction	Optional	
	6083	Rx	Optional	Not applicable to BD applications
PRE-POST (6A)	6066	DisplaySize	Optional	
	6075	Trigger	Optional	
	6077	In/Exclude Auction	Optional	
	6083	Rx	Optional	Not applicable to BD applications
10b-18 (2A)	6062	Starttime	Optional	Defaults to current time if no time is provided
	6063	Endtime	Optional	Defaults to market close if no time is provided
	6064	MaxPctVolume	Optional	
	6066	DisplaySize	Optional	
	6075	Trigger	Optional	
	6077	In/Exclude Auction	Optional	
CUSTOM (8)				All fields available, but not mandatory
CUSTOM 1 (E)				All fields available, but not mandatory
CUSTOM 2 (F)				All fields available, but not mandatory
CUSTOM 3 (G)				All fields available, but not mandatory
CUSTOM 4 (H)				All fields available, but not mandatory

Summary of Input Parameters

Tactic	Start Time	End Time	Max % Volume	Min % Volume	Exec. Style	Display Size	Trigger	Rx	In/Exclude
PATHFINDER	✓					✓	✓	✓	✓
CROSSFINDER+	✓	✓	✓	✓	✓	✓	✓	✓	✓
SNIPER	✓		✓	✓	✓	✓	✓	✓	✓
GUERRILLA	✓		✓	✓	✓	✓	✓	✓	✓
FLT-GUERRILLA	✓		✓	✓	✓	✓	✓	✓	✓
IWOULD	✓	✓	✓	✓	✓	✓	✓	✓	✓
INLINE	✓	✓	✓	✓	✓	✓	✓	✓	✓
VOLUME INLINE	✓	✓	M	✓	✓	✓	✓	✓	✓
VWAP	✓	✓	✓			✓	✓	✓	✓
TWAP	✓	✓	✓			✓	✓	✓	✓
TEX	✓	✓	✓		✓	✓	✓	✓	✓
FLOAT	✓				✓	✓	✓	✓	✓
RESERVE	✓				✓	✓	✓	✓	✓
CLOSE			✓			✓	✓	✓	✓
10b-18	✓	✓	✓			✓	✓		✓
PRE-POST						✓	✓	✓	✓
CUSTOM	✓	✓	✓	✓	✓	✓	✓	✓	✓
CUSTOM1	✓	✓	✓	✓	✓	✓	✓	✓	✓
CUSTOM2	✓	✓	✓	✓	✓	✓	✓	✓	✓
CUSTOM3	✓	✓	✓	✓	✓	✓	✓	✓	✓
CUSTOM4	✓	✓	✓	✓	✓	✓	✓	✓	✓

✓ Optional; M Mandatory

2. Modification of AES Parameters via FIX Cancel/Replace Message

Credit Suisse supports the ability to handle the modification of AES parameters via a FIX cancel/replace message. The following values may now be modified as part of an AES-enriched cancel/replace message:

- **Limit Price** – as on any normal order cancel/replace
- **Order Quantity** – as on any normal order cancel/replace
- **Order Type** – as on any normal order cancel/replace
- **6061** – ExecServProduct
- **6062** – Starttime
- **6063** – Endtime
- **6064** – MaxPctVolume
- **6065** – Execution Style
- **6067** – MinPctVolume

Please note that all the same parameter rules apply (specified in the matrix on page 5 above), with regard to which parameters are available/required for each strategy. Credit Suisse will default any unspecified parameters on the original order (the client must specify the overall strategy if any other AES parameters are sent in the new order message). The client may change some or all of these parameters by sending a FIX cancel/replace message. Any parameters not specified in the cancel/replace message will be defaulted. The defaults that are applied will depend upon the cancel/replace implementation methodology used. One of two, logically different, and mutually exclusive methodologies can be used to support the cancel/replace of AES parameters. Either:

1. Basic: Parameter values not specified in the cancel/replace message will be defaulted, or:
2. Enhanced: Parameter values not specified in the cancel/replace message will retain the values from the original order.

Basic Implementation

Requirement: An order management system (OMS) that has integrated the AES user-defined FIX tags for sending orders electronically.

Credit Suisse will apply default values for any applicable strategy's parameters that are not specified by the client in the cancel/replace request. This is consistent with how Credit Suisse applies default values on a new order, when a strategy's parameters are not specified.

For instance:

Original Order: tag 6064 (MaxPctVolume) = 20.

Replace #1: tag 6064 not specified and there is another parameter with value explicitly changed.

After the replacement, the MaxPctVolume will be 0.

Note: Display size is not amenable. Pathfinder is not eligible for cancel replace.

Enhanced Implementation

Requirements:

1. An order management system (OMS) that has integrated the AES user-defined FIX tags for sending orders electronically.
2. An OMS that stores and maintains ("remembers") the most-recently sent AES parameters. The OMS must be able to store the most recently sent AES parameters so that the trader has the ability to pull those values up in the order ticket and modify them as part of a FIX cancel/replace message.

Credit Suisse will store all the AES information from the original order. When a replace message is sent for one of these orders, any parameters not supplied by the client will remain unaltered from the original order. Any parameters sent in the replace message will override those sent in the original order. Subsequent replacements that do not supply AES parameters will copy their values from the previous version of the order.

For instance:

Original Order: tag 6064 (MaxPctVolume) = 20.

Replace #1: tag 6064 = 15.

Replace #2: tag 6064 not supplied.

After the second replacement, the MaxPctVolume will be 15.

Credit Suisse natively supports Basic implementation but can support Enhanced if required.

We recommend consulting with your regional Client Connectivity Engineering Team to discuss the "Enhanced" methodology, before making your final implementation decision.

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CREDIT SUISSE SECURITIES (USA) LLC

11 Madison Avenue
New York, NY 10010

www.credit-suisse.com

