Cloud Stream
User Manual

Version: 4.0

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1 Introduction

Cloud Stream allows customers to easily retrieve real-time public market data feeds of selected DBAG products via cloud-based solution. The solution is designed to minimize the entry barrier for market data access by using standard solutions and technologies:

- Connectivity is available via public internet by using WebSocket technology.
- Both binary (Google Protocol Buffers – GPB) and ascii (JSON) data encoding is supported.
- Message content is – as far as possible – aligned to FIX specification; thus, field names and valid values can be easily understood and in addition, supported valid values are documented in the GPB protocol description.
- Cloud Stream solution is furthermore designed for support any kind of data feeds, beside trades, quotes, aggregates (L2) orderbook also incremental data feeds with full depth orderbook data.

This document describes the message layouts and the technical details of the streaming solution.

This manual relates to the interface version number 001.000.007.

2 Authentication and Authorization

2.1 API key-based authentication

The streaming WebSocket API is secured using standard **API key-based authentication** method which is required during the establishing of the connection. The API keys can be generated by browsing and logging into the following URL

https://md.deutsche-boerse.com/

The user icon will allow the user to generate and maintain the API keys

The real-time stream can be reached by the following URL

wss://md.deutsche-boerse.com/stream?format=<json|proto>

A valid API key must be provided in the HTTP header X-API-Key field

X-API-Key: <token>

Differences between json and binary format
You can choose during connecting to the feed between binary and json format. Depending on the targeted performance, binary format is faster to process and consumes less bandwidth than json and is to be preferred in general.

2.2 External identity

The page below is displayed for the user to Sign into Cloud Stream GUI. We're using an established solution for working with external identities which requires the existing as well as new users to Sign up. Signing up is a one-time activity.

2.2.1 Sign up

The Sign up can be done any time after the Datafeeds has created the user account. The screen below is accessible by clicking the link from the email or directly under https://md.deutsche-boerse.com/

The process starts on the Sign-up screen where the email address will be provided and a code to verify that email will be sent. The code received via the email must be verified here.

The user must fill in the form and agree to the Terms of Use before hitting Create

Next, the multi-factor choice will be made on this screen. The code will be sent using the desired choice when signing in.

2.2.2   Sign in

The Sign-in will ask for extra verification.
As usual, the user will introduce his email and password then get to the first screen below where he must hit Send verification code to fulfill the multi-factor authentication.
The code will be entered here and the Sign-in will be completed once the user will Continue

3 Messaging – feed subscription

https://github.com/Deutsche-Boerse/Cloud.Stream.Client/tree/main/proto/src/client.proto

In order to retrieve market data feed, the customer has to select the interested data stream. For this reason, after the physical connection has been established, customer has to *subscribe* to the stream of interest. This can be done sending the Subscribe request to the server:

Fieldname	Description	Content
event	Event (action) name	"subscribe"
requestId	Optional request id, will be returned to the client as part of the response message.	Identification provided by the customer.

stream	List of stream name and stream offset in case of data recovery.
	"md-microproducts"
	"md-tradegate"
	(see Appendices)
		e.g.
		`{"stream": "md-microproducts", "startTime": "1659008334123456789"}`
		startTime is in nanoseconds since epoch, TZ=UTC
		or
		`{"stream": "md-microproducts", "startSeq": 12345}`
		startSeq is an integer to be used to start at the first message having the sequence number or the next one available

Unsubscribe

If the customer is no more interested to receive data from the stream, the unsubscribe request can be used:

Fieldname	Description	Content
event	Event (action) name	"unsubscribe"
requestId	Optional request id, will be returned to the client as part of the response message.	Identification provided by the customer.
stream	List of stream names. "md-microproducts" "md-tradegate" (see Appendices)	e.g. `"stream": ["md-microproducts"]`

Example

{"event":"subscribe", "requestId":123456789, "subscribe":{"stream":[{"stream": "md-tradegate"}]}}
{"event":"unsubscribe", "requestId":123456789, "unsubscribe":{"stream":["md-tradegate"]}}

The Request to Subscribe or Unsubscribe will be replied with Response containing a Status field that will inform about the result.
The count and order of Response messages is the same as the one in repeated streams field of the Request.
Client is disconnected in case the Request is malformed.
We impose limits on client Requests and disconnect the client in case those limits are reached.
Contact Functional Support for details in case you are impacted and need to discuss these limits.

Example for Status=OK

{"subs": "md-tradegate", "messages": [{"@type": "type.googleapis.com/Client.Response", "requestId": "123456789"}]}

4 Service availability

The service will be technically available 24x7 without interruption; planned maintenance will be announced in advance. The respective data made available via Cloud Stream is only available and updated if the relevant trading venue or other source(s) of the data is open for business and/or trading.

Service	Telephone	Email
Functional Support	+49 (0)69 – 211 - 11540	datafeeds@deutsche-boerse.com
Contractual Support	+49-(0)69 – 211 - 13440	data.services@deutsche-boerse.com

5 Data and service messages

The messages which will be sent to the customer based on his subscription were defined in a generic mode so that any kind of messages can be transported by the same technical interface. The StreamMessage contains the following fields:

Field Name	Type	Description
subs	string	Subscription information – stream or topic name
seq	uint64	Sequence number of the message in the stream; this number has to be used on case of message recovery.
messages	object	List of messages – the list will contain usually only a single message.

5.1 Google Protocol Buffers

The usage of Google Protocol Buffers is forcing some standard. Please be recommended to read https://protobuf.dev/programming-guides/proto3/#default for the usage of default values. E.g. values for enum fields are not sent, if they are default values ('0'=).

5.2 JSON Format

The same is valid for using JSON format. Please be recommended to read https://protobuf.dev/programming-guides/proto3/#json for the usage of JSON format.

6 Appendix A – Eurex Micro Derivatives and Eurex Cryptocurrency Derivatives feed

https://github.com/Deutsche-Boerse/Cloud.Stream.Client/tree/main/proto/src/md_cef.proto

Stream Name for **Eurex Micro Derivatives** is "md-microproducts".
Stream Name for **Eurex Cryptocurrency Derivatives** is "md-cryptoproducts".

Message type: Market Data

FIX Tag	FIX Field Name	Req'd	FAST Data Type	Description
35	MsgTyp	Y	Enum	Message type '0' = MarketDataIncrementalRefresh ('X') '1' = MarketDataSnapshotFullRefresh ('W')
< ApplSeqCtrl > group starts				
1180	> ApplID	Y	uint32	Application ID
1181	> ApplSeqNum	Y	uint64	Application Sequence Number
< ApplSeqCtrl > group ends				
< Instrument > group starts				
1301	> MktID	Y	String	Market Identifier
55	> Sym	Y	String	Symbol – instrument identification
22	> Src	N	Enum	Security ID Source '0' = ISIN '1' = Exchange Symbol '2' = Synthetic
167	> SecTyp	Y	enum	Security Type '0' = No Security Type '1' = Future '2' = Option
200	> MMY	N	string	Maturity Month Year
30866	> CntrDate	N	Int32	Contract Date
	> Ct	N	enum	Contract Type '0' = Standard ('S') '1' = Flexible ('F')

201	> PutCall	N	enum	Put or Call '0' = Put '1' = Call
25034	> CntrGenNr	N	Int32	Contract Generation Number
1193	> SettlMeth	N	enum	Settlement method '0' = Cash ('C') '1' = Physical ('P')
2578	> OrigStrkPx	N	decimal	Original Strike Price
1194	> ExerStyle	N	enum	Exercise Style '0' = European ('E') '1' = American ('A')
< Instrument > group ends				
< Data > group starts				
< Bid > group starts				
270	> Px	N	decimal	Bid Price – MDEntryPrice
271	> Sz	N	decimal	Bid Size – MDEntrySize
346	> NumOfOrds	N	int32	Number Of Orders
< Bid > group ends				
< Offer > group starts				
270	> Px	N	decimal	Offer Price – MDEntryPrice
271	> Sz	N	decimal	Offer Size – MDEntrySize
346	> NumOfOrds	N	int32	Number Of Orders
< Offer > group ends				
336	SesID	N	enum	Trading Session ID '1' = Day '3' = Morning '5' = Evening '6' = Afterhours '7' = Holiday

625	SesSub	N	enum	Trading Session Sub ID
				'1' = PreTrading
				'3' = Continuous
				'4' = Closing
				'5' = PostTrading
				'6' = Scheduled Intraday Auction
				'7' = Quiescent
				'8' = AnyAuction
				'103' = Continuous Auction Issuer
				'104' = Continuous Auction Specialist
2447	FastMktInd	N	bool	Fast Market Indicator
326	TrdgStat	N	enum	Security Trading Status
				'2' = TradingHalt
				'200' = Closed
				'201' = Restricted
				'202' = Book
				'203' = Continuous
				'204' = OpeningAuction
				'205' = OpeningAuctionFreeze
				'206' = IntradayAuction
				'207' = IntradayAuctionFreeze
				'208' = CurcuitBreakerAuction
				'209' = CurcuitBreakerAuctionFreeze
				'210' = ClosingAuction
				'211' = ClosingAuctionFreeze
				'212' = IPOAuction
				'213' = IPOAuctionFreeze
				'214' = PreCall
				'215' = Call
				'216' = Freeze
				'217' = TradeAtClose
2705	MktCond	N	enum	Market Condition
				'0' = normal market
				'1' = stressed market

270	Px	N	decimal	Price
271	Sz	N	decimal	Size
828	TrdTyp	N	enum	Trade type
2449	NumOfBuyOrds	N	int32	Number of Buy orders
2450	NumOfSellOrds	N	int32	Number of Sell orders
1024	MDOrigTyp	N	enum	Origin of the market data '0' = Book '1' = Off-Book
15	Ccy	N	string	Currency
278	MDID	N	string	Market data entry ID (match step ID)
880	MtchID	N	string	Trade Match ID
279	UpdtAct	N	enum	Update action type '0' = New '1' = Change '2' = Delete
277	TrdCond	N	enum	Trade condition '0' = 'U' // FIX Exchange Last '1' = 'R' // FIX Opening Price '2' = 'AJ' // FIX Official Close Price '3' = 'AW' // FIX Last Auction Price '4' = 'AX' // FIX High Price '5' = 'AY' // FIX Low Price '6' = 'BD' // FIX Previous Closing Price '7' = 'BB' // FIX Midpoint Price '8' = 'BC' // FIX Trading On Terms Of issue '9' = 'SA' // FIX Special Auction '10' = 'TC' // FIX Trade At Close '11' = 'k' // FIX Out of Sequence '12' = 'a' // FIX Volume Only
965	Status	N	enum	Instrument Status '1' = Active

				'2' = Inactive
				'10' = Published
				'11' = Pending Deletion
2705	MktCond	N	enum	Stressed Market Ind
				'0' = Normal
				'1' = Stressed
				'2' = Exceptional
423	PxTyp	N	enum	Code to represent the price type
				'1' = percentage
				'2' = unit
202	StrkPx	N	decimal	Current strike price
	StlPx	N	decimal	Settlement price
	SettlCcy	N	string	Settlement currency
	Int	N	decimal	Open Interest
1020	TrdVol	N	decimal	Total volume
< Bids > sequence starts				
270	>> Px		decimal	Bid price
271	>> Sz		decimal	Bid size
346	>> NumOfOrds		int32	Number of orders on bid side
< Bids > sequence ends				
< Offers > sequence starts				
270	>> Px		decimal	Offer price
271	>> Sz		decimal	Offer size
346	>> NumOfOrds		int32	Number of orders on offer side
< Offers > sequence ends				
	Pap	N	decimal	Potential Auction Price
	Opn	N	decimal	Opening Price
	Cls	N	decimal	Closing Price

273	Tm	Y	uint64	MD Entry Time
< Data > group ends				

For additional information on the instrument it is recommended to process the Market Data Snapshot Full Refresh messages (W), which are disseminated twice a day.

7 Appendix B – Tradegate feed

https://github.com/Deutsche-Boerse/Cloud.Stream.Client/tree/main/proto/src/md_cef.proto

Stream Name for **Tradegate** is "md-tradegate".

Message type: Market Data

FIX Tag	FIX Field Name	Req'd	FAST Data Type	Description
35	MsgTyp	Y	enum	Message type 'X' = MarketDataIncrementalRefresh 'W' = MarketDataSnapshotFullRefresh
< ApplSeqCtrl > group starts				
1180	> ApplID	Y	uint32	Application ID
1181	> ApplSeqNum	Y	uint64	Application Sequence Number
< ApplSeqCtrl > group ends				
< Instrument > group starts				
1301	> MktID	Y	string	Market Identifier 'XGAT'
55	> Sym	Y	string	Symbol – instrument identification
167	> SecTyp	Y	enum	Security Type 0 = No Security Type // None 1= FUT // Future 2 = OPT // Option 3 = MLEG // Multileg Instrument 4 = INDEX // Index 5 = ETC // Exchange traded commodity 6 = ETN // Exchange traded note 7 = CS // Common Stock 8 = REPO // Repurchase 9 = CASH // Cash 10 = FOR // Foreign Exchange Contract 11 = BOND // Bond 12 = MF // Mutual Fund

				13 = FUN // Investment Fund
				14 = IRS // Interest Rate Swap
				15 = SR // Subscription Right
				16 = WAR // Warrant
				99 = OTHER // Other
< Instrument > group ends				
< Data > group starts				
< Quote.Bid > group starts				
270	> Px	N	decimal	Bid Price – MDEntryPrice
271	> Sz	N	decimal	Bid Size – MDEntrySize
1070	> MDQteTyp	N	enum	Bid – MDQuoteType 0 = INDICATIVE (Taxe) 1 = TRADEABLE (Quote)
< Quote.Bid > group ends				
< Quote.Offer > group starts				
270	> Px	N	decimal	Offer Price – MDEntryPrice
271	> Sz	N	decimal	Offer Size – MDEntrySize
1070	> MDQteTyp	N	enum	Offer – MDQuoteType 0 = INDICATIVE (Taxe) 1 = TRADEABLE (Quote)
< Quote.Offer > group ends				
326	TrdgStat	N	enum	SecurityTradingStatus 0 = UNDEFINED 2 = TRADINGHALT 203 = CONTINUOUS 204 = OPENINGAUCTION 208 = CIRCUITBREAKERAUCTION
965	Status	N	enum	SecurityStatus 0 = UNDEFINED 1 = ACTIVE

				9 = SUSPENDED
270	Px	N	decimal	Price (Last Trade)
271	Sz	N	decimal	Size (Last Qty)
273	Tm	N	uint64	MD Entry Time - Trade message: Last Trade Time - Quote message: Quotation Time
423	PxTyp	N	enum	PriceType 0 = UNDEFINED 1 = PERCENTAGE 2 = PER_UNIT 9 = YIELD 22 = BASIS_POINT
828	TrdTyp	N	enum	Trade type 1107 = IPOAUCTIONTRADE
15	Ccy	N	string	Currency
6	AvgPx	N	decimal	AvgPx (Average Price)
1020	TrdVol	N	decimal	TradeVolume
	Ttt	N	decimal	TotalTurnover
2490	TrdNum	N	int32	TradeNumber
278	MDID	N	string	Market data entry ID
880	MtchID	N	string	Trade Match ID
279	UpdtAct	N	enum	Update action type 0 = NEW 1 = CHANGE 2 = DELETE
277	TrdCond	N	enum	Trade condition 0 = U // FIX Exchange Last 1 = R // FIX Opening Price 4 = AX // FIX High Price 5 = AY // FIX Low Price

270	MDEntryPx	N	decimal	ClosePx (Tradegate Close price)
140	PrevClsPx	N	decimal	PrevClosePx
344	ClsTim	N	uint64	Official Close Timestamp
343	PreClsTim	N	uint64	Previous Official Close Timestamp
15	Ccy	N	string	Currency
< Data > group ends				

For additional information on the instrument it is recommended to process the Market Data Snapshot Full Refresh messages (W), which are disseminated twice a day.

8 Appendix D – Xetra Spot feed

https://github.com/Deutsche-Boerse/Cloud.Stream.Client/tree/main/proto/src/md_cef.proto

Stream Name for **Xetra ETF ETP** is "md-xetraetfetp".

Message type: Market Data

FIX Tag	FIX Field Name	Req'd	FAST Data Type	Description
35	MsgTyp	Y	Enum	Message type '0' = MarketDataIncrementalRefresh ('X') '1' = MarketDataSnapshotFullRefresh ('W')
< ApplSeqCtrl > group starts				
1180	> ApplID	Y	uint32	Application ID
1181	> ApplSeqNum	Y	uint64	Application Sequence Number
< ApplSeqCtrl > group ends				
< Instrument > group starts				
1301	> MktID	Y	string	Market Identifier
55	> Sym	Y	string	Symbol – instrument identification
22	> Src	N	enum	Security ID Source '0' = ISIN '1' = Exchange Symbol '2' = Synthetic
167	> SecTyp	Y	enum	Security Type '0' = No Security Type '5' = Exchange traded commodity '6' = Exchange traded note '17' = Exchange traded fund '99' = Other
15	> Ccy	N	string	Currency
455	> AltID	N	string	SecurityAltID
456	> AltIDSrc	N	enum	SecurityAltIDSource

				'4' = ISIN
7703	> MktSeg	N	string	MarketSegment
969	> MinPxIncr	N	decimal	MinPriceIncrement
980	> UpdActn	N	enum	SecurityUpdateAction '0' = NEW '1' = DELETE '2' = MODIFY
779	> LastUpdateTm	N	uint64	LastUpdateTime
< Event > sequence starts				
865	>> EventTyp	N	Enum	EventType '0' = UNDEFINED '6' = INACTIVATION '7' = LAST_ELIGIBLE_TRADE_DATE '28' = FIRST_ELIGIBLE_TRADE_DATE
866	>> Dt	N	uint32	EventDate
< Event > sequence ends				
< Instrument > group ends				
< Data > group starts				
< Bid > group starts				
270	> Px	N	decimal	Bid Price – MDEntryPrice
271	> Sz	N	decimal	Bid Size – MDEntrySize
346	> NumOfOrds	N	int32	Number Of Orders Bid Side
1070	> MDQteTyp	N	enum	MDQuoteType Bid Side '0' = INDICATIVE '1' = TRADEABLE
269	> Typ	N	enum	MDEntryType '0' = BID '11' = MARKET_BID

< Bid > group ends				
< Offer > group starts				
270	> Px	N	decimal	Offer Price – MDEntryPrice
271	> Sz	N	decimal	Offer Size – MDEntrySize
346	> NumOfOrds	N	int32	Number Of Orders Offer Side
1070	> MDQteTyp	N	enum	MDQuoteType Offer Side '0' = INDICATIVE '1' = TRADEABLE
269	> Typ	N	enum	MDEntryType '1' = OFFER '12' = MARKET_OFFER
< Offer > group ends				
423	PxTyp	N	enum	Code to represent the price type '0' = UNDEFINED '1' = PERCENTAGE '2' = PER_UNIT '9' = YIELD '22' = BASIS_POINT
965	Status	N	enum	SecurityStatus '0' = UNDEFINED '1' = ACTIVE '2' = INACTIVE '4' = EXPIRED '5' = DELISTED '6' = KNOCKED_OUT '9' = SUSPENDED '10' = PUBLISHED '11' = PENDING_DELETION '12' = KNOCKED_OUT_AND_ SUSPENDED
336	SesID	N	enum	TradingSessionID '0' = UNDEFINED

				'1' = DAY
				'2' = HALFDAY
				'3' = MORNING
				'4' = AFTERNOON
				'5' = EVENING
				'6' = AFTERHOURS
				'7' = HOLIDAY
625	SesSub	N	enum	TradingSessionSubID
				'0' = UNDEFINED
				'1' = PRETRADING
				'3' = CONTINUOUS
				'4' = CLOSING
				'5' = POSTTRADING
				'6' = SCHEDULEDINTRADAYAUCTION
				'7' = QUIESCENT
				'8' = ANYAUCTION
				'10' = OUTOFMAINSESSIONTRADING
				'103' = CONTINUOUSAUCTIONISSUER
				'104' = CONTINUOUSAUCTIONSPECIALIST
2447	FastMktInd	N	bool	FastMarketIndicator
				0 = FALSE
				1 = TRUE
326	TrdgStat	N	enum	SecurityTradingStatus
				'0' = UNDEFINED
				'1' = OPENING_DELAY
				'2' = TRADINGHALT
				'3' = RESUME
				'19' = NOT_TRADED_ON_THIS_MARKET
				'23' = FAST_MARKET
				'200' = CLOSED
				'201' = RESTRICTED
				'202' = BOOK
				'203' = CONTINUOUS
				'204' = OPENINGAUCTION

				'205' = OPENINGAUCTIONFREEZE
				'206' = INTRADAYAUCTION
				'207' = INTRADAYAUCTIONFREEZE
				'208' = CIRCUITBREAKERAUCTION
				'209' = CIRCUITBREAKERAUCTIONFREEZE
				'210' = CLOSINGAUCTION
				'211' = CLOSINGAUCTIONFREEZE
				'212' = IPOAUCTION
				'213' = IPOAUCTIONFREEZE
				'214' = PRECALL
				'215' = CALL
				'216' = FREEZE
				'217' = TRADEATCLOSE
				'218' = RETAILPRECALL
				'219' = RETAILCALL
				'220' = CIRCUITBREAKERAUCTIONTRIGGEREDBYSTATIC LIMITBREACH
				'221' = CIRCUITBREAKERAUCTIONTRIGGEREDBYSTATIC LIMITBREACHFREEZE
2705	MktCond	N	enum	Market Condition '0' = NORMAL '1' = STRESSED '2' = EXCEPTIONAL
25045	TesStatus	N	enum	SecurityStatus '0' = UNDEFINED '1' = ACTIVE '2' = INACTIVE '4' = EXPIRED '5' = DELISTED '6' = KNOCKED_OUT '9' = SUSPENDED '10' = PUBLISHED '11' = PENDING_DELETION '12' = KNOCKED_OUT_AND_ SUSPENDED

2542	MktSegStat	N	enum	MarketSegmentStatus
				'0' = UNDEFINED
				'1' = ACTIVE
				'2' = INACTIVE
				'3' = PUBLISHED
270	Px	N	decimal	Price
271	Sz	N	decimal	Size
828	TrdTyp	N	enum	TradeType
				'0' = REGULARTRADE
				'1' = BLOCKTRADE
				'2' = EFP
				'12' = EXCHANGEFORSWAP
				'50' = PORTFOLIOCOMPRESSIONTRADE
				'54' = OTC
				'55' = EXCHANGEBASISFACILITY
				'1000' = VOLATRADE
				'1001' = EFPFINTRADE
				'1002' = EFPINDEXFUTURESTRADE
				'1004' = BLOCKTRADEATMARKET
				'1006' = XETRAEUREXENLIGHTTRIGGEREDTRADE '1007' = BLOCKQTPIPTRADE
				'1017' = DELTATRADEATMARKET
				'1100' = OPENINGAUCTIONTRADE
				'1101' = INTRADAYAUCTIONTRADE
				'1102' = VOLATILITYAUCTIONTRADE
				'1103' = CLOSINGAUCTIONTRADE
				'1104' = CROSSAUCTIONTRADE
				'1107' = IPOAUCTIONTRADE
				'1108' = LIQUIDITYIMPROVEMENTCROSS
				'1109' = RETAILAUCTIONTRADE
2449	NumOfBuyOrds	N	int32	Number of Buy orders
2450	NumOfSellOrds	N	int32	Number of Sell orders
1024	MDOrigTyp	N	enum	Origin of the market data

				'0' = MDOT_BOOK
				'1' = MDOT_OFF_BOOK
278	MDID	N	string	Market data entry ID (match step ID)
880	MtchID	N	string	TradeMatchID
279	UpdtAct	N	enum	Update action type
				'0' = NEW
				'1' = DELETE
				'2' = MODIFY
277	TrdCond	N	enum	Trade condition
				'0' = 'U' // FIX Exchange Last
				'1' = 'R' // FIX Opening Price
				'2' = 'AJ' // FIX Official Close Price
				'3' = 'AW' // FIX Last Auction Price
				'4' = 'AX' // FIX High Price
				'5' = 'AY' // FIX Low Price
				'6' = 'BD' // FIX Previous Closing Price
				'7' = 'BB' // FIX Midpoint Price
				'8' = 'BC' // FIX Trading On Terms Of issue
				'9' = 'SA' // FIX Special Auction
				'10' = 'TC' // FIX Trade At Close
				'11' = 'k' // FIX Out of Sequence
				'12' = 'a' // FIX Volume Only
				'13' = 'XR' // Retail
< Bids > sequence starts				
270	>> Px		decimal	Bid price
271	>> Sz		decimal	Bid size
346	>> NumOfOrds		int32	Number of orders on bid side
1070	>> MDQteTyp	N	enum	MDQuoteType Bid Side
				'0' = INDICATIVE
				'1' = TRADEABLE
269	>> Typ	N	enum	MDEntryType

				'1' = OFFER
				'12' = MARKET_OFFER
< Bids > sequence ends				
< Offers > sequence starts				
270	>> Px		decimal	Offer price
271	>> Sz		decimal	Offer size
346	>> NumOfOrds		int32	Number of orders on offer side
1070	>> MDQteTyp	N	enum	MDQuoteType Offer Side '0' = INDICATIVE '1' = TRADEABLE
269	>> Typ	N	enum	MDEntryType '1' = OFFER '12' = MARKET_OFFER
< Offers > sequence ends				
	OpenPx	N	decimal	Opening Price
	ClosePx	N	decimal	Closing Price
332	HighPx	N	decimal	High Price
333	LowPx	N	decimal	Low Price
	AvgPx	N	decimal	Average Price
1020	TrdVol	N	decimal	TotalVolume
	Ttt	N	decimal	TotalTurnover
2490	TrdNum	N	int32	TradeNumber
2490	TrdNumTes	N	int32	TradeNumberTes
344	ClsTim	N	uint64	CloseTime
	RefPx	N	decimal	Reference Price
234	Val	N	string	StipulationValue - 'CD' (Cum Dividend) - 'XD' (Ex Dividend)

< Pxs > sequence starts				
269	MDEntryType	N	enum	MDEntryType '4' = Opening Price '6' = Close Price '7' = High Price '8' = Low Price '9' = Average price 'M' = Previous Close Price
270	MDEntryPx	N	decimal	MD EntryPrice
271	MDEntrySz	N	decimal	MD Entry Size
273	MDEntryTime	N	uint64	MD Entry Time
< Pxs > sequence ends				
273	Tm	Y	uint64	MD Entry Time
< Data > group ends				

For additional information on the instrument it is recommended to process the Market Data Snapshot Full Refresh messages (W), which are disseminated twice a day.

9 Appendix E – 360T Spot and Swap feed

https://github.com/Deutsche-Boerse/Cloud.Stream.Client/tree/main/proto/src/md_cef.proto

Stream Name for **360T Spot and Swap** are reflecting the current products range (Spot and Swap) as well as additional options for all data
-   "md-360t.spot"
-   "md-360t.swap.ndf"
-   "md-360t.swap.lm"
-   "md-360t.swap.g10"
-   "md-360t.swap.*" – for **all Swap data**
-   "md-360t.>" – for **all Spot and Swap data**

With the user providing several streams in the Subscribe message _we will reduce the actual subscription to the highest level possible to cover the complete data requested by the user_.

The reduction takes place when **all data** subscriptions overlap with others.
As an example "md-360t.>" being the highest level (covering all data) only this subscription will be made, reducing all other streams present in the Subscribe message to this one.
The "md-360t.swap.*" will reduce lower levels (e.g. md-360t.swap.lm) where applicable.

The Subscribe response will provide a reply only for the subscribed streams after the reduction.
The Unsubscribe message will be accepted if it matches a previously Subscribed stream.

9.1 Message type: 360T Spot Data

FIX Tag	FIX Field Name	Req'd	FAST Data Type	Description
35	MsgTyp	Y	Enum	Message type '0' = MarketDataIncrementalRefresh ('X') '1' = MarketDataSnapshotFullRefresh ('W')
< ApplSeqCtrl > group starts				
1180	> ApplID	Y	uint32	Application ID
1181	> ApplSeqNum	Y	uint64	Application Sequence Number
< ApplSeqCtrl > group ends				
< Instrument > group starts				
1301	> MktID	Y	string	Market Identifier = 360T
55	> Sym	Y	string	Symbol – instrument identification Currency Pair XXX/YYY
22	> Src	N	enum	Security ID Source '0' = ISIN

FIX Tag	FIX Field Name	Req'd	FAST Data Type	Description
				'1' = Exchange Symbol
				'2' = Synthetic
167	> SecTyp	Y	enum	Security Type
				'0' = No Security Type
				'10' = Foreign Exchange Contract
15	> Ccy	N	string	Currency
< Instrument > group ends				
< Md Price > repeating group starts				
269	MDEntryType	N	Char	MDEntryType = 'H'
270	MDEntryPrice	N	Float	Price as Rate
271	MDEntrySize	N	int	Spread Volume / Volume in first currencies the spread is representing
423	PriceType	N	Int	20 = Mid Price or 12 = Spread
< Md Price > repeating group ends				
273	Tm	Y	uint64	MD Entry Time

9.2 Message type: 360T Swap Data

FIX Tag	FIX Field Name	Req'd	FAST Data Type	Description
35	MsgTyp	Y	Enum	Message type
				'0' = MarketDataIncrementalRefresh ('X')
				'1' = MarketDataSnapshotFullRefresh ('W')
< ApplSeqCtrl > group starts				
1180	> ApplID	Y	uint32	Application ID
1181	> ApplSeqNum	Y	uint64	Application Sequence Number
< ApplSeqCtrl > group ends				
< Instrument > group starts				
1301	> MktID	Y	string	Market Identifier = 360T
55	> Sym	Y	string	Symbol – instrument identification

				Currency Pair XXX/YYY
22	> Src	N	enum	Security ID Source '0' = ISIN '1' = Exchange Symbol '2' = Synthetic
167	> SecTyp	Y	enum	Security Type '0' = No Security Type '18' = FXSWAP
6215	> TenorValue	Y	string	Tenor Value
15	> Ccy	N	string	Currency
< Instrument > group ends				
< Bid > group starts				
269	MDEntryType	N	Char	'0' - Bid
270	MDEntryPrice	N	Float	Price as Best Bid
271	MDEntrySize	N	float	Size as Best Bid Qty
276	QuoteCondition	N	char	Quote Type 0 = Firm 1 = Indicaive
5675	ForwardPoints	N	float	BidSwapPoints
5678	Pip	N	Int	Pip
5679	HolWarn	N	char	Holidays 0 = No Holiday 1 = Holiday
< Bid > group ends				
< Ask > group starts				
269	MDEntryType	N	Char	'1' – Ask
270	MDEntryPrice	N	Float	Price as Best Ask
271	MDEntrySize	N	float	Size as Best Ask Qty

276	QuoteCondition	N	char	Quote Type 0 = Firm 1 = Indicaive
5675	ForwardPoints	N	float	OfferSwapPoints
5678	Pip	N	Int	Pip
5679	HolWarn	N	char	Holidays 0 = No Holiday 1 = Holiday
< Bid > group ends				
273	Tm	Y	uint64	MD Entry Time
64	SettlDate	N	LocalMktDate	SettlDate

10 Appendix F – Identifiers of the <Instrument> Groups

1301 MktId	167 SecTyp	55 Sym	30866 ContrDate	Ct	1193 SettlMeth	1194 ExerStyle	2578 OrigStrkPx	201 PutCall	25034 CntrGenNr
XEUR	'1' = Future	X	X	X	X				
	'2' = Option	X	X	X	X	X	X	X	X

1301 MktId	167 SecTyp	55 Sym
XGAT	7 = CS // Common Stock Or any other	X

1301 MktId	167 SecTyp	55 Sym	15 Ccy
XETR	'5' = Exchange traded commodity	X	X
	'6' = Exchange traded note	X	X
	'17' = Exchange traded fund	X	X

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1301 MktId	167 SecTyp	55 Sym	6215 TenorValue
360T	'10' = Foreign Exchange Contract	X	
	'18' = FXSWAP	X	X

11 Change log

No	Chapter, page	Date	Change
1.0	General	November 25, 2022	Initial version for publication
1.1	Appendix A 2 Authentication and Authorization, 3 Feed Subscription	April 12, 2023	Adjustments for micro options, adjustments for Authorization header field, and example for Feed Subsription
1.2	2 Authentication and Authorization	April 13, 2023	Adjustments of values of the format parameter (json | proto)
2.0	Appendix D	June 21, 2023	Added Appendix D for Xetra ETF & ETP
3.0	Appendix B, 8.2.10 Chapter 3 Appendix A	August 28, 2023	Added new Kaiko message type Rate, new streams Extended stream field content for Subsribe message Added Cryptoproducts
3.1	Page 5, Appendix A, B, D	October 09, 2023	Adjustment of stream names and other minor corrections
3.2	Page 3 Page 9, Appendix A	March 04, 2024	Interface version number and connecitivity availability option is updated. Changed product names.
3.3	Page 28, Appendix D	June 03, 2024	Appendix D adjustment for DBDX Crypto Spot
3.4	Appendix A, C, D Appendix E	November 07, 2024	Removal of specific fields from documentation, since they are not disseminated for the corresponding product(s). Identifiers of the <Instrument> Groups
3.5	Appendix E Appendix F Appendix C Appendix D Chapter 2	April 14, 2025	Appendix E stream for 360T Spot and Swap Appendix F (formerly E) expanded by 360T Removed Kaiko Removed DBDX Crypto Spot API key-based authentication
3.6	Appendix D	October 23, 2025	Value adjustments for T7 14.0
4.0	2.2 External identity	December 9, 2025	Authentication and Authorization extension