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Generic Market ACcelerator GMAC

V3 Messages Specifications

About This Document

This document describes the normalized GMAC V3 messages.

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Revisions

Revision	Date	Description of Changes
R2013-1.0	29 JAN 2013	Release R2013-1.0 - Added values to GMACMessageQuoteRequestV3.QuoteType - Added values to GMACMessageImbalanceV3.CrossType - Added flags to GMACOrderConditions - Added flags to GMACTradeConditions - Added GMACExtensionStructEurexFeedRef.MarketDepth - Added GMACExtensionStructXetraPacketHeader.PerformanceIndicator - GMACExtensionStructXetrapacketHeader.SrcId is renamed into GMACExtensionStructXetrapacketHeader.SenderCompID
R2012-8.3	16 JAN 2013	Release R2012-8.3 - Added flags to GMACTradeConditions - Added VenueID to GMACMessageLULDPriceBandV3 - Added GMACCLULDFinraIndicatorV3 enumeration
R2012-8.1	05 DEC 2012	Release R2012-8.1 - Added SettlePriceFactor to GMACExtensionICEMessageB and GMACExtensionICEMessagep
R2012-8.0	28 NOV 2012	Release R2012-8.0 - Added IsRegulatory to GMACMessageImbalanceV3 - Added LastTradeQuantity to GMACMessageOHLCV3 - Added FASTDecoded to GMACExtensionCME2PacketHeader - Added extension message GMACExtensionStructEurexEMDIPacketHeader - Added extension message GMACExtensionStructEurexFeedRef - Added message GMACMessageRetailPriceImprovementV3 - Added flags to GMACTradeConditions - Added flags to GMACQuoteConditions - Extension message GMACExtensionNYSERetailPriceImprovement is deprecated
R2012-7.1	31 OCT 2012	Release R2012-7.1 - Added message GMACExtensionISEMDIProductInfo
R2012-7.0	17 OCT 2012	Release R2012-7.0 - Added OrigCategory to GMACCMessageLULDPriceBandV3 - Added FinraLULDIndicator to GMACCMessageTOBV3 - Added SuspendedStatus to GMACMessageTradingStatusV3 - Added ClosingType to GMACMessageDerivativeHeaderV3
R2012-6.3	27 SEP 2012	Release R2012-6.3 - Added bit field UseSideAndIndexForIdentification to the presence map of GMACMessageOrderUpdateV3, GMACMessageOrderExecutedV3 and GMACMessageOrderDecreaseV3 - Added flags to OrderConditions of GMACMessageOrderUpdateV3 - Added flags to GMACTradeConditions for BrokerTec

Revision	Date	Description of Changes
R2012-6.2	13 SEP 2012	Release R2012-6.2 - Added QuoteCondition[0] = 'O' (OPRA) to GMACCOrderDataV3
R2012-6.1	07 SEP 2012	Release R2012-6.1 - Added LULDIndicator, LULDNationalIndicator and RetailInterest to GMACCMessageTOBV3 - Added message GMACCMessageLULDPriceBandV3 - Added message GMACCMessageMWCBV3 - Added message GMACCMessageMWCBStatusV3
R2012-6.0	17 AUG 2012	Release R2012-6.0 - Added GatewayLocID to GMACExtensionStructEurexProdRef - Added extension message GMACExtensionCME2PacketHeader - Message GMACMessageSnapshotUpdateV3: field LastMsgSeqNum is renamed PacketSyncSequence and field SymbolSyncSequence is added
R2012-5.2	17 AUG 2012	Release R2012-5.2 - Added OrderValidity to GMACMessageOrderUpdateV3
R2012-5.1	07 AUG 2012	Release R2012-5.1 - Added extension message GMACExtensionICEMessageV - Added extension message GMACExtensionNYSERetailPriceImprovement
R2012-5.0	28 JUN 2012	Release R2012-5.0 - BATS extension messages GMACExtensionBATSAddOrder and GMACExtensionBATSModifyOrder are deprecated - LSE Millennium extension message GMACExtensionLSEMillenniumExtraInfo is deprecated - GMACCurrency is of type char [GMAC_MAX_CURRENCY_LENGTH] - Added message GMACExtensionStructLiffeThrottleSize - Added SlowQuote flag to QuoteConditions of GMACMessageOrderDepthV3 - Added VWAP to GMACMessageOHLCV3 - Added ActionType = 'L' to GMACMessageOrderDepthV3
1.1a	21 JUN 2012	Release R2012-4.2 - Added message GMACMessageTimeReferenceV3 - Value CSTATUS_END_OF_CYCLES of enumeration GMACCycleStatus is valid for both Eurex and XETRA - Added EndOfSnapshotCycle to GMACMessageSnapshotUpdateV3 - Changed GMACMessageSnapshotUpdateV3 Trailer field description - Added OrderConditions to GMACMessageOrderUpdateV3 - Added PreOpen, SettlementDateTime, IsOfficial and Volatility to GMACMessageOHLCV3
1.1	21 MAY 2012	Release R2012-4.0 - Added XETRA extension messages - Added GMAC_CUSTOM_QUANTITY_TYPE_CUSTOMER_ALL_OR_NONE to enumeration GMACCustomQuantityType - Added GMAC_CUSTOM_QUANTITY_TYPE_CUSTOMER_PROFESSIONAL to enumeration GMACCustomQuantityType - Added details regarding message GMACMessageReferenceSecurityV3
1.0	01 FEB 2012	Initial release

1. GMAC V3 Messages

1.1 Overview

GMAC messages are grouped into three distinct categories:

- Market data generic messages: these messages are generated as normalized messages for various exchange data feeds;
- Consolidated generic messages: these messages are generated as normalized messages for the consolidated data feeds (OPRA, CQS, CTS, UQDF, UTDF);
- Specific messages: these messages are exchange specific messages.

The presence map is a bit combination indicating the presence or the absence of a field in the message. If the presence map bit is set, it indicates that the field is sent within the message and if not, it indicates that the field is omitted.

Fields indexed with "PM" e.g. **InstrumentIndex**^{PM} are subject to the presence map: for these fields, check the presence map bit to check whether the field is present or not in the message.

Note #1:

If a field described in a message in the following sections is not part of the same message description in one of the GMAC plugin mapping specifications, it means that the field is subject to the presence map and is not present in the message generated by the said GMAC plugins.

Note #2:

If an exchange specific field is not mapped against one of the GMAC field as per the GMAC plugin mapping specifications, it means that the exchange specific field is not transcoded and therefore not provided by the GMAC plugin.

1.2 Message Header

Description The message header is present at the beginning of any GMAC message.

Structure GMACMessageHeader

The header description is as follows:

Field	Type	Description
MsgType	GMACMessageType	Exchange message type
Length	uint16_t	Message length
ExtensionsLength	uint16_t	Length of all extension messages for this message. Extension messages are located just after the GMAC message. The length of the whole set is Length + ExtensionsLength.
SymbolSequence	uint64_t	Unique sequence number associated with the symbol. In case of market messages containing multiple updates the symbol sequence number will be repeated.
Sequence	uint64_t	Message sequence number in the original packet.
ExchangeTimestamp	uint64_t	Timestamp published by the Exchange, expressed in nano seconds past UTC midnight. Value ~0 if the timestamp is undefined.

1.3 Market Data Generic Messages

This section describes the market data generic and normalized GMAC messages.

1.3.1 Imbalance Message

Description The imbalance message is used to provide information about imbalances.

Structure GMACMessageImbalanceV3

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
InstrumentIndex[PM]	GMACInstrumentIndex	Instrument ID If present, InstrumentName will not be present
InstrumentName[PM]	GMACInstrumentName	Instrument name If present, InstrumentIndex will not be present
CrossType[PM]	char	Type of cross Possible values: 'O' Opening 'C' Closing 'H' Halted 'M' Market 'I' IPO 'P' PIXL (PHLX Price Improvement XL mechanism whereby an initiating member submits a two-sided (buy and sell) order into an auction process soliciting price improvement) 'S' Solicitation 'o' Order exposure (PHLX Order
		Exposure - there is an exposed buy (or sell) order available for execution at the NBO (or NBB)) 'c' COLA (PHLX Complex Order Live Auction)
Direction[PM]	char	Market Side Possible values: 'B' Bid 'S' Ask 'N' No imbalance 'O' Insufficient orders
Variation[PM]	char	Price variation code Possible values: '-' Not specified
Reference[PM]	GMACPrice	Reference price
Far[PM]	GMACPrice	Far price
Near[PM]	GMACPrice	Near price
Paired[PM]	GMACQuantity	Volume for paired shares at current reference price
Imbalance[PM]	GMACQuantity	Volume for not paired shares at current reference price
MktImbalance[PM]	GMACQuantity	Volume for not paired market shares at current reference price
BuyShares[PM]	GMACQuantity	Number of shares on buy side that are priced equal to or greater than the reference price
SellShares[PM]	GMACQuantity	Number of shares on sell side that are priced equal to or less than the reference price
AuctionOnlyPrice[PM]	GMACPrice	Price at which the auction book would match using only eligible auction orders
IsRegulatory[PM]	char	Is the imbalance a regulatory Rule 123c published closing imbalance? Possible values: 'Y' Regulatory imbalance

Field	Type	Description
		'N' Informational imbalance

1.3.2 Information Message

Description The information message is used to provide any optional information where no generic messages are built from the feed.

Structure GMACMessageInformationV3

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
InstrumentIndex[PM]	GMACInstrumentIndex	Instrument ID If present, InstrumentName will not be present
InstrumentName[PM]	GMACInstrumentName	Instrument name If present, InstrumentIndex will not be present
MarketDataEntry[PM]	char	Market data entry type
CycleStatus[PM]	GMACCycleStatus	CycleStatus used for Eurex and XETRA to indicate which phase of Reference data is being received on the Reference Data multicast
OpenInterest[PM]	uint32_t	OpenInterest is the number of unsettled contracts in the previous time period and is used for ICE

1.3.3 OHLC Message

Description The OHLC message is used to provide information about prices such as the opening price, the highest price, the lowest price, the closing price and the last trade price.

Structure GMACMessageOHLCV3

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
InstrumentIndex[PM]	GMACInstrumentIndex	Instrument ID If present, InstrumentName will not be present
InstrumentName[PM]	GMACInstrumentName	Instrument name If present, InstrumentIndex will not be present
InstrumentContext[PM]	uint32_t	Context information related to the instrument
PreOpen[PM]	GMACPrice	Pre-opening price
Open[PM]	GMACPrice	Opening price
High[PM]	GMACPrice	Highest price
Low[PM]	GMACPrice	Lowest price
Close[PM]	GMACPrice	Closing price If present, Settlement and Fixing will not be present
Settlement[PM]	GMACPrice	Settlement price If present, Close and Fixing will not be present
Fixing[PM]	GMACPrice	Fixing price

Field	Type	Description
		If present, Settlement and Close will not be present
LastTrade[PM]	GMACPrice	Last trade price
LastTradeQuantity[PM]	GMACQuantity	Last trade quantity
Currency[PM]	GMACCurrency	Currency
TotalVolume[PM]	GMACQuantity	Total volume
PriceType[PM]	GMACPriceType	Price type
DataType[PM]	GMACDataType	Data type. When present, it Indicates if the message is a snapshot or not (used for plugins where snapshots and live updates are disseminated interleaved on the same multicasts). When not present, it is possible to ascertain whether a complete multicast is reserved for snapshots from GMACStats for the multicast, accessible via `GMACStatsMulticast()` (see the GMAC API Reference Guide).
BestPrice[PM]	GMACPrice	Best trade price
Volatility[PM]	GMACPrice	Volatility
SettlementDateTime[PM]	uint64_t	Settlement date and time
IsOfficial[PM]	uint8_t	Flag to indicate if the settlement price is official or not
VWAP[PM]	GMACPrice	Volume Weighted Average Price

1.3.4 Order Decrease Message

Description The order decrease message is used to provide information about order quantity reduction.

The message has a bit field only present in the presence map UseSideAndIndexForIdentification set where an order is uniquely identified by OrderID, InstrumentIndex and Side.

Structure GMACMessageOrderDecreaseV3

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
InstrumentIndex[PM]	GMACInstrumentIndex	Instrument ID If present, InstrumentName will not be present
InstrumentName[PM]	GMACInstrumentName	Instrument name If present, InstrumentIndex will not be present
InstrumentContext[PM]	uint32_t	Context information related to the instrument
OrderID	GMACOrderID	Order ID
Side[PM]	GMACSide	Side
Quantity[PM]	GMACQuantity	Quantity reduction The whole order should be deleted if not provided

1.3.5 Order Depth Message

Description The order depth message is used to provide information about order book change.

Structure GMACMessageOrderDepthV3

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
ActionType	char	Action type Possible values: 'N' New level 'U' Update at the specified price else insert at the specified level 'L' Insert at specified level and replace existing data (including price) at that level 'Z' Unknown (either N or U) 'D' Delete level 'F' Delete level from 'T' Delete to level
ReasonCode[PM]	char	Reason code for change Possible values: 'O' New order 'C' Cancel 'E' Execution 'X' Multiple events 'U' Unspecified
InstrumentIndex[PM]	GMACInstrumentIndex	Instrument ID If present, InstrumentName will not be present
InstrumentName[PM]	GMACInstrumentName	Instrument name If present, InstrumentIndex will not be present
InstrumentContext[PM]	uint32_t	Context information related to the instrument
Price[PM]	GMACPrice	Price
Quantity[PM]	GMACQuantity	Quantity
Level[PM]	uint32_t	Book level. Top of book is level 0.
ReservedTopOfBook[PM]	char	Reserved top of book indicator Present for feeds where the top of book is provided via dedicated messages as well as via regular depth book messages - e.g. Liffe or Eurex. Refer also to the documentation on config node gmac.markets.market.depth-mode - see GMAC Configuration Guide for details. Possible values: 'B' Reserved top of book updates 'D' Depth book updates
Side	GMACSide	Side
NumberOfOrders[PM]	uint32_t	Number of orders in market
TradingStatus[PM]	GMACTradingStatus	Trading status
QuoteConditions[PM]	GMACQuoteConditions	Additional conditions for the quote (bit fields)
CustomerQuantity[PM]	GMACQuantity	Quantity of customer orders
GapIndicator[PM]	char	Gap indicator Possible values: '1' No gap '2' Possible gap
DataType[PM]	GMACDataType	Data type. When present, it Indicates if the message is a snapshot or not (used for plugins where snapshots and live updates are disseminated interleaved on the same multicasts).

Field	Type	Description
		When not present, it is possible to ascertain whether a complete multicast is reserved for snapshots from GMACStats for the multicast, accessible via `GMACStatsMulticast()` (see the GMAC API Reference Guide).
CustomQuantitiesCount	int	Number of custom quantities
►CustomQuantities[].Type	GMACCustomQuantityType	Custom quantity type
►CustomQuantities[].Quantity	GMACQuantity	Custom quantity

1.3.6 Order Executed Message

Description The order executed message is used to provide information about order execution.

The message has a bit field only present in the presence map UseSideAndIndexForIdentification set where an order is uniquely identified by OrderID, InstrumentIndex and Side.

Structure GMACMessageOrderExecutedV3

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
InstrumentIndex[PM]	GMACInstrumentIndex	Instrument ID If present, InstrumentName will not be present
InstrumentName[PM]	GMACInstrumentName	Instrument name If present, InstrumentIndex will not be present
InstrumentContext[PM]	uint32_t	Context information related to the instrument
OrderID	GMACOrderID	Order ID
TradeID[PM]	GMACTradeID	Trade ID
Price[PM]	GMACPrice	Price at which the trade was executed
Quantity[PM]	GMACQuantity	Quantity of trade and/or value to be subtracted from the order unless RemainingQuantity is present. If not specified the whole order was executed.
RemainingQuantity[PM]	GMACQuantity	Remaining quantity
AggressorSide[PM]	GMACSide	Aggressor Side
TradeConditions[PM]	GMACTradeConditions	Additional conditions (bit fields) for the trade (market specific)

1.3.7 Order Reset Message

Description The order reset message is used to provide information about order reset on a given instrument.

Structure GMACMessageOrderResetV3

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
InstrumentIndex[PM]	GMACInstrumentIndex	Instrument ID

Field	Type	Description
		If present, InstrumentName will not be present
InstrumentName[PM]	GMACInstrumentName	Instrument name If present, InstrumentIndex will not be present
InstrumentContext[PM]	uint32_t	Context information related to the instrument
ResetBid	int	Reset bid side
ResetAsk	int	Reset ask side

1.3.8 Order Update Message

Description The order update message is used to provide information about new or updated orders.

The message has a bit field only present in the presence map UseSideAndIndexForIdentification set where an order is uniquely identified by OrderID, InstrumentIndex and Side.

Structure GMACMessageOrderUpdateV3

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
ActionType	char	Action type Possible values: 'N' New order 'U' Order update 'Z' Unknown (either N or U) 'M' New order at market price
		'F' New order with must be filled price 'S' New order with special terms
Side[PM]	GMACSide	Side
InstrumentIndex[PM]	GMACInstrumentIndex	Instrument ID If present, InstrumentName will not be present
InstrumentName[PM]	GMACInstrumentName	Instrument name If present, InstrumentIndex will not be present
InstrumentContext[PM]	uint32_t	Context information related to the instrument
OrderID	GMACOrderID	Order ID
TraderID[PM]	GMACTraderID	Trader ID
PreviousOrderID[PM]	GMACOrderID	Previous Order ID Set if ActionType = 'U' or 'Z' Set to OrderID if no change
Price[PM]	GMACPrice	Price
Quantity[PM]	GMACQuantity	Quantity Replaces the previous quantity if ActionType = 'U' or 'Z'
ImpliedOrder[PM]	char	Implied order Possible values: 'Y' Implied 'N' Not implied
OrderConditions[PM]	GMACOrderConditions	Additional conditions (bit fields) for the order (market specific)
OrderValidity[PM]	OrderValidity	Additional validity (bit fields) for the order (market specific)

1.3.9 Quote Request Message

Description The quote request message is used to provide information about request for quotes.

Structure GMACMessageQuoteRequestV3

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
InstrumentIndex[PM]	GMACInstrumentIndex	Instrument ID If present, InstrumentName will not be present
InstrumentName[PM]	GMACInstrumentName	Instrument name If present, InstrumentIndex will not be present
RequestID	GMACOrderID	Quote request ID
Quantity	GMACQuantity	Quantity
Side[PM]	GMACSide	Side
TransactTime[PM]	uint64_t	Transaction time
QuoteType[PM]	char	Quote type Possible values: '1' Indicative quote '2' Tradable quote '3' Cross request

1.3.10 Reference Security Message

Description The reference security message is the single message used to provide information about the security definition regardless the security type.

The message is however differently valued depending on the security type:

- If the security is an equity, only the GMACMessageReferenceHeaderV3 structure is populated with the appropriate information about the equity.
- If the security is a derivative instrument, the GMACMessageReferenceHeaderV3 structure and the GMACMessageDerivativeHeaderV3 structure are populated with the appropriate information about the derivative. The GMACMessageDerivativeHeaderV3 structure also contains information about the linkage with the underlying.
- If the security is a strategy instrument, then the GMACMessageReferenceHeaderV3 structure is populated with the appropriate information about the strategy. The GMACMessageDerivativeHeaderV3 structure contains information about each leg of the strategy including the linkage with the outright instrument.

Structure GMACMessageReferenceSecurityV3

The message description is as follows:

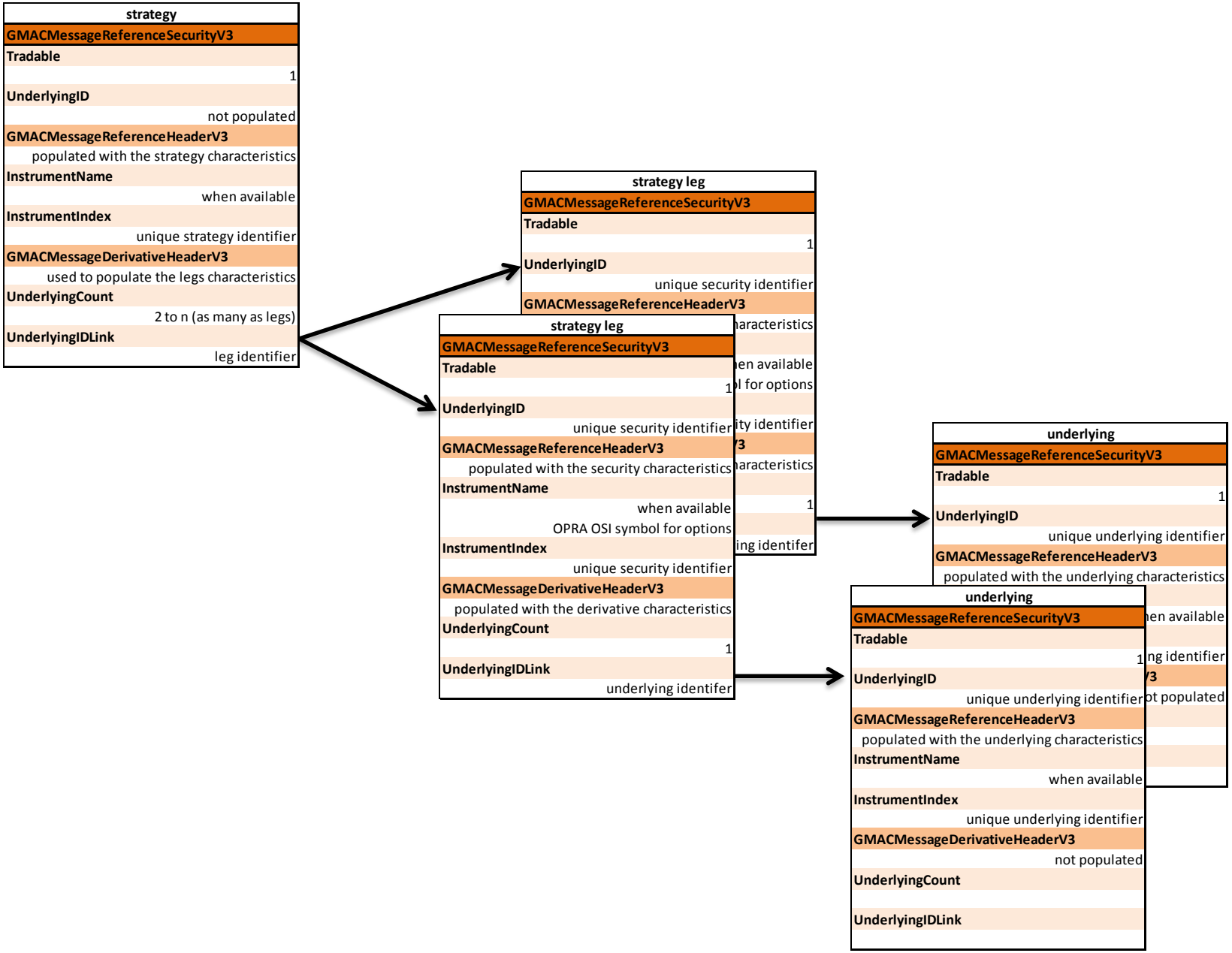
Field	Type	Description
Head	GMACMessageHeader	
UnderlyingID[PM]	GMACUnderlyingID	Underlying ID Used to retrieve security characteristics using UnderlyingIDLink
Tradable	int	Tradable indicator Possible values: 1 Tradable 0 Otherwise
ReferenceSecurity	GMACMessageReferenceHeaderV3	

Field	Type	Description
ReferenceDerivative[PM]	GMACMessageDerivativeHeaderV3	

The relationships between a strategy, its security legs and their underlyings is done by linking UnderlyingIDLink from GMACMessageDerivativeHeaderV3 to UnderlyingID from GMACMessageReferenceSecurityV3.

The linkage between one security and its underlying is available as long as UnderlyingIDLink is populated; the linkage depth therefore depends on the exchanges.

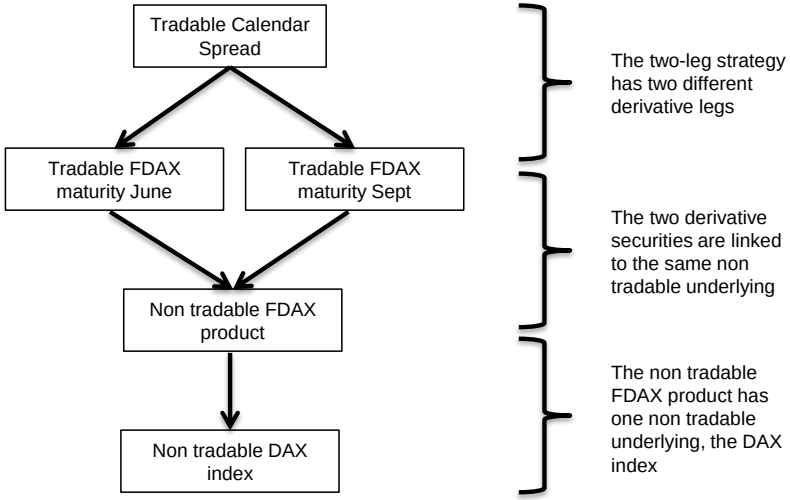
The following figure illustrates an example of a two-leg strategy where each leg is a derivative security having a different underlying.


strategy
GMACMessageReferenceSecurityV3
Tradable
1
UnderlyingID
not populated
GMACMessageReferenceHeaderV3
populated with the strategy characteristics
InstrumentName
when available
InstrumentIndex
unique strategy identifier
GMACMessageDerivativeHeaderV3
used to populate the legs characteristics
UnderlyingCount
2 to n (as many as legs)
UnderlyingIDLink
leg identifier
strategy leg
GMACMessageReferenceSecurityV3
Tradable
1
UnderlyingID
unique security identifier
GMACMessageReferenceHeaderV3
strategy leg
GMACMessageReferenceSecurityV3
Tradable
1
UnderlyingID
unique security identifier
GMACMessageReferenceHeaderV3
populated with the security characteristics
InstrumentName
when available
OPRA OSI symbol for options
InstrumentIndex
unique security identifier
GMACMessageDerivativeHeaderV3
populated with the derivative characteristics
UnderlyingCount
1
UnderlyingIDLink
underlying identifer
underlying
GMACMessageReferenceSecurityV3
Tradable
1
UnderlyingID
unique underlying identifier
GMACMessageReferenceHeaderV3
populated with the underlying characteristics
underlying
GMACMessageReferenceSecurityV3
Tradable
1
UnderlyingID
unique underlying identifier
GMACMessageReferenceHeaderV3
populated with the underlying characteristics
InstrumentName
when available
InstrumentIndex
unique underlying identifier
GMACMessageDerivativeHeaderV3
not populated
UnderlyingCount
UnderlyingIDLink

The following figure illustrates an example of a security of type equity tradable on a stock exchange.

equity
GMACMessageReferenceSecurityV3
Tradable
1
UnderlyingID
not populated
GMACMessageReferenceHeaderV3
populated with the equity characteristics
InstrumentName
when available
InstrumentIndex
unique equity identifier
GMACMessageDerivativeHeaderV3
not populated
UnderlyingCount
UnderlyingIDLink

The following figure illustrates an example of the linkage depth available on the Eurex market.



1.3.11 Session Message

Description The session message is used to provide information about market sessions. Each session starts with this message. The action type is set to either 'S' or 'M' depending on whether there are some missing messages from the beginning of the session. The end of session is marked with action type 'E' and it is the last message of that session.

Structure GMACMessageSessionV3

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
ActionType	char	Action type Possible values: 'S' Start of day 'E' End of day 'M' Mid-day start

1.3.12 Bundle Marker Message

Description Bundle Marker Messages generated from a single transaction may be grouped (bundled) between two Bundle Marker messages.

Structure GMACMessageBundleMarkerV3

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
BeginningOrEnd	uint32_t	Action type Possible values: 0 Beginning of a block 1 End of a block

1.3.13 Snapshot Update Message

Description The message is sent in front of a snapshot update for a specified instrument.

The message is immediately followed by the NumberOfMessages messages related to that snapshot all within a GMAC packet. More than one snapshot update message may be present in a GMAC packet, each snapshot update message being separated by NumberOfMessages messages.

For some feeds the NumberOfMessages is unknown at the time of message generation. For those feeds the snapshot messages are again followed by a snapshot update message where the bit-field trailer is specified. The trailing snapshot update message is sent only for cases where some information in the initiating snapshot update message is missing.

Structure GMACMessageSnapshotUpdateV3

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
InstrumentIndex[PM]	GMACInstrumentIndex	Instrument ID If present, InstrumentName will not be present
InstrumentName[PM]	GMACInstrumentName	Instrument name If present, InstrumentIndex will not be present
InstrumentContext[PM]	uint32_t	Context information related to the instrument
PacketSyncSequence[PM]	uint64_t	Last message sequence number in the live feed where the update applies
SymbolSyncSequence[PM]	uint64_t	Last message sequence number in the live symbol stream where the update applies
TotNumReports[PM]	uint32_t	Total number of reports returned
NumberOfMessages	uint32_t	Number of GMAC messages to follow
RefreshStatus[PM]	uint32_t	Specifies whether the exchange requires the user to perform a refresh or no
Trailer[PM]	uint8_t	If set this message was generated at the end of a snapshot. It may not necessarily indicate the end of a snapshot cycle: for instance, it indicates the end of a single instrument snapshot when the snapshot cycle is related to a set of instruments. Trailer is not mandatory and is issued in the case where snapshot information is unavailable and presented towards the end of the snapshot. In such cases the NumberOfMessages is zeroed.
EndOfSnapshotCycle[PM]	uint8_t	When set, indicates the end of a snapshot cycle.

1.3.14 Total Volume Message

Description The total volume message is used to provide information about the total volume for an instrument.

Structure GMACMessageTotalVolumeV3

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
InstrumentIndex[PM]	GMACInstrumentIndex	Instrument ID If present, InstrumentName will not be present
InstrumentName[PM]	GMACInstrumentName	Instrument name If present, InstrumentIndex will not be present
TotalVolume	GMACQuantity	Total traded volume

1.3.15 Trade Message

Description The trade message is used to provide information about trades.

Structure GMACMessageTradeV3

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
InstrumentIndex[PM]	GMACInstrumentIndex	Instrument ID If present, InstrumentName will not be present
InstrumentName[PM]	GMACInstrumentName	Instrument name If present, InstrumentIndex will not be present
InstrumentContext[PM]	uint32_t	Context information related to the instrument
TradeID[PM]	GMACTradeID	Trade ID
Side[PM]	GMACSide	Aggressor Side
NumberOfOrdersBuy[PM]	uint32_t	Number of orders on the buy side
NumberOfOrdersSell[PM]	uint32_t	Number of orders on the sell side
GapIndicator[PM]	char	Flag indicating a gap in the book updates Possible values: '1' No gap '2' Possible gap
EntryTime[PM]	int64_t	Local exchange time at which the trade was processed by the exchange system in nanoseconds since midnight
Quantity[PM]	GMACQuantity	Quantity executed
Price	GMACPrice	Price at which the trade was executed
TotalVolume[PM]	GMACQuantity	Total traded volume since the beginning of the session
TradeConditions[PM]	GMACTradeConditions	Additional conditions (bit fields) for the trade (market specific)
Action[PM]	ActionType	Action for the trade

1.3.16 Trading Status Message

Description The trading status is used to provide information about market or segment

or instrument status changes.

Structure GMACMessageTradingStatusV3

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
ChannelID[PM]	GMACChannelID	Channel ID
SegmentID[PM]	uint32_t	Segment ID
SectorID[PM]	uint32_t	Section ID within the segment
InstrumentIndex[PM]	GMACInstrumentIndex	Instrument ID If present, InstrumentName will not be present
InstrumentName[PM]	GMACInstrumentName	Instrument name If present, InstrumentIndex will not be present
InstrumentContext[PM]	uint32_t	Context information related to the instrument
TradingStatus	GMACTradingStatus	Trading status
ExchSpecificTradingStatus[PM]	GMACExchTradingStatus	Exchange specific trading status
RawExchangeTradingStatus[PM]	uint32_t	Exchange trading status as is
DataType[PM]	GMACDataType	Data type. When present, it Indicates if the message is a snapshot or not (used for plugins where snapshots and live updates are disseminated interleaved on the same multicasts).
		When not present, it is possible to ascertain whether a complete multicast is reserved for snapshots from GMACStats for the multicast, accessible via `GMACStatsMulticast()` (see the GMAC API Reference Guide).
SuspendedStatus[PM]	uint8_t	Indicates the instrument is currently in a suspended state when the field is present and set. The suspended state can only be removed by a subsequent trading status message with this field present set to zero.

1.3.17 Uncrossing Message

Description The uncrossing message is used to provide information about auction.

Structure GMACMessageUncrossingV3

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
InstrumentIndex[PM]	GMACInstrumentIndex	Instrument ID If present, InstrumentName will not be present

Field	Type	Description
InstrumentName[PM]	GMACInstrumentName	Instrument name If present, InstrumentIndex will not be present
InstrumentContext[PM]	uint32_t	Context information related to the instrument
BestBidPrice[PM]	GMACPrice	Best bid price
BestAskPrice[PM]	GMACPrice	Best ask price
MidPrice[PM]	GMACPrice	Middle price
UncrossingPrice[PM]	GMACPrice	Uncrossing price
UncrossingVolume[PM]	GMACQuantity	Uncrossing volume

1.3.18 Dummy Message

Description The dummy message is published when a packet from the exchange only contains messages that are not published as any other type of GMAC message, in order that sequence number continuity be maintained and users be able to detect gaps reliably.

Structure GMACMessageDummyV3

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
InstrumentIndex[PM]	GMACInstrumentIndex	Instrument ID If present, InstrumentName will not be present
InstrumentName[PM]	GMACInstrumentName	Instrument name
		If present, InstrumentIndex will not be present
InstrumentContext[PM]	uint32_t	Context information related to the instrument

1.3.19 SHO Short Sale Price Restriction Message

Description This message is used to inform whether a short sale price restriction is in effect or not for a given instrument.

Structure GMACMessageSHOShortSalePriceRestrictionV3

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
InstrumentIndex[PM]	GMACInstrumentIndex	Instrument ID If present, InstrumentName will not be present
InstrumentName[PM]	GMACInstrumentName	Instrument name If present, InstrumentIndex will not be present
InstrumentContext[PM]	uint32_t	Context information related to the instrument
SHOShortRestr	GMACShortSaleRestriction	Short sale price restriction in effect

1.3.20 Time Reference Message

Description The time reference message is used to provide the exchange reference timestamp when the exchange provides timestamps split among multiple messages, one containing the reference timestamp and other messages

containing only timestamp offset since the last reference.

The message is generated depending on configuration tag <exchange-timestamp>.

TimestampReference is to be kept in memory (and overwritten whenever a new TimestampReference is transcoded) for the given instrument, and used for any following timestamp computation.

TimestampOffset is to be used to compute the next transcoded GMAC message's timestamp, and has to be added to the last received TimestampReference. The TimestampOffset is only valid for the next GMAC message.

Any message transcoded but not preceded by a GMACMessageTimeReferenceV3 with a TimestampOffset field set, has already the correct timestamp in ExchangeTimestamp in its header GMACMessageHeader.

Structure GMACMessageTimeReferenceV3

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
InstrumentIndex[PM]	GMACInstrumentIndex	Instrument ID If present, InstrumentName will not be present
InstrumentName[PM]	GMACInstrumentName	Instrument name If present, InstrumentIndex will not be present
TimestampReference[PM]	uint64_t	Reference timestamp published by the exchange for an instrument. Expressed in nanoseconds past UTC midnight.
TimestampOffset[PM]	uint64_t	Offset timestamp since the last timestamp reference published by the exchange for an instrument. Expressed in nanoseconds past UTC midnight.

1.3.21 Retail Price Improvement Message

Description This message is used to provide retail price improvement indicator.

Structure GMACMessageRetailPriceImprovementV3

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
InstrumentIndex[PM]	GMACInstrumentIndex	Instrument ID If present, InstrumentName will not be present
InstrumentName[PM]	GMACInstrumentName	Instrument name If present, InstrumentIndex will not be present
RPIIndicator	uint8_t	RPI condition. Possible values: 0 Neither bid or offer (default) 1 Bid 2 Offer 3 Bid and offer

1.3.22 Quote Conditions Structure

Description This structure contains bit fields to provide additional market specific conditions for quotes.

It is used in message GMACMessageOrderDepthV3.

Structure GMACQuoteConditions

The available fit fields are as follows:

Field	Used in GMAC plugins
ExchangeBest	CME EUREX
Implied	CME EUREX XDP
OutrightOrder	EUREX
OutrightQuote	EUREX
SlowQuote	NYSE
RMFQuotes	EURONEXT
NoLP	EURONEXT
LPOnlyAsk	EURONEXT
LPOnlyBid	EURONEXT
LPAskBid	EURONEXT

1.3.23 Trade Conditions Structure

Description This structure contains bit fields to provide additional market specific conditions for a trade.

It is used in message GMACMessageOrderExecutedV3 and GMACMessageTradeV3.

Structure GMACTradeConditions

The available fit fields are as follows:

Field	Used in GMAC plugins
SystemPricedCrackSpreadLeg	ICE CME2
SystemPricedLeg	ICE CME2 CSM
ImpliedSpreadAtMarketOpen	ICE
AdjustedTrade	ICE
OffMarketTrade	ICE CME2
OpeningTrade	CME2 CMS
PriceCalculatedByExchange	CME2
Block	XDP CSM
Others	XDP
Auctions	XETRA
OccurredAtCross	ITCH_BROKERTEC
ExchangeLast	EUREX_MDI EUREX_EMDI
OpeningPrice	EUREX_MDI EUREX_EMDI
HighPrice	EUREX_MDI EUREX_EMDI
LowPrice	EUREX_MDI EUREX_EMDI
OfficialClosingPrice	EUREX_MDI EUREX_EMDI

Field	Used in GMAC plugins
OpeningAuctionTrade	EUREX_MDI EUREX_EMDI XETRA
IntradayAuctionTrade	EUREX_MDI EUREX_EMDI
VolatilityAuctionTrade	EUREX_MDI EUREX_EMDI XETRA
ClosingAuctionTrade	EUREX_MDI EUREX_EMDI XETRA
OutOfSequence	EUREX_MDI EUREX_EMDI CSM
CrossAuctionTrade	EUREX_MDI EUREX_EMDI
Late	CSM
IntermarketSweep	CSM
ExchangeFutureForPhysical	CSM
Benchmark	CSM
ContinuousTrading	XETRA
EndofDayAuction	XETRA

1.3.24 Order Conditions Structure

Description This structure contains bit fields to provide additional market specific conditions for orders.

It is used in message GMACMessageOrderUpdateV3.

Structure GMACOrderConditions

The available fit fields are as follows:

Field	Used in GMAC plugins
SIPDisplay	BATS
RetainPriority	BATS DIRECTEDGE
ImpliedOrder	ITCH_BROKERTEC
Force	ITCH_BROKERTEC
ShortSell	ITCH_BROKERTEC
MarketBid	ITCH_BROKERTEC
PriceStabilization	ITCH_BROKERTEC
OverrideCrossing	ITCH_BROKERTEC
Undisclosed	ITCH_BROKERTEC
FillAndKill	ITCH_BROKERTEC
FirmColorDisabled	ITCH_BROKERTEC
ConvertToAggressive	ITCH_BROKERTEC
Renotification	PHLXTOPOPLUS

1.3.25 Order Validity Structure

Description This structure contains bit fields to provide additional market specific validity conditions for orders.

It is used in message GMACMessageOrderUpdateV3.

Structure OrderValidity

The available fit fields are as follows:

Field	Used in GMAC plugins

Field	Used in GMAC plugins
MorningHours	ARCA_XDP
NormalHours	ARCA_XDP
ExtendedHours	ARCA_XDP

1.3.26 Reference Header Structure

Description Reference header of each GMACMessageReferenceSecurityV3.

Structure GMACMessageReferenceHeaderV3

The structure description is as follows:

Field	Type	Description
PriceFactor[PM]	GMACPriceFactor	The price value of an instrument should be corrected by price factor. Price factors are corrected, so that dividing the native price gives a number with GMAC_DECIMAL_PLACES fixed decimal places.
DealPriceFactor[PM]	GMACPriceFactor	Deal price factor If present, TradePriceFactor will not be present
TradePriceFactor[PM]	GMACPriceFactor	Trade price factor If present, DealPriceFactor will not be present
ChannelID[PM]	GMACChannelID	Channel ID
SegmentID[PM]	uint32_t	Segment ID
SectorID[PM]	uint32_t	Sector ID
InstrumentName[PM]	GMACInstrumentName	Instrument name
InstrumentIndex[PM]	GMACInstrumentIndex	Instrument ID
InstrumentContext[PM]	uint32_t	Context information related to the instrument
ActionType[PM]	char	Action type Possible values: 'N' New 'U' Update 'D' Delete
TradingStatus[PM]	GMACTradingStatus	Trading status
Currency[PM]	GMACCurrency	Currency
TickSize[PM]	GMACPrice	Tick size
TickSizeAboveLimit[PM]	GMACPrice	Tick size above the specified limit
TickSizeLimit[PM]	GMACPrice	Tick size limit
ReferencePrice[PM]	GMACPrice	Previous day closing price
ReferenceDate[PM]	uint32_t	Date at which the reference price was taken
PriceType[PM]	GMACPriceType	Price type
ImpliedPrices[PM]	char	Implied price indicator Possible values: 'Y' Implied prices are allowed 'N' Implied prices are not allowed
RoundLotSize[PM]	GMACQuantity	Board lot size
LowLimit[PM]	GMACPrice	Minimum price allowed for the instrument
HighLimit[PM]	GMACPrice	Maximum price allowed for the instrument
MinTradeVolume[PM]	GMACQuantity	Minimum volume allowed for the instrument
MaxTradeVolume[PM]	GMACQuantity	Maximum volume allowed for the instrument

Field	Type	Description
MaxPriceVariation[PM]	GMACPrice	Maximum price fluctuation allowed for the instrument
MinLotSize[PM]	GMACQuantity	Minimum lot size
MinCabPrice[PM]	GMACPrice	Minimum cabinet price
UnitQuantity[PM]	GMACQuantity	Contract size
Unit[PM]	GMACUnit	Unit in which the contract size is defined
OrderBookDepth[PM]	uint32_t	The maximum number of levels broadcast for order book building

1.3.27 Derivatives Reference Header Structure

Description Derivatives reference header.

It is used in message GMACMessageReferenceSecurityV3.

Structure GMACMessageDerivativeHeaderV3

The structure description is as follows:

Field	Type	Description
VenueID[PM]	uint64_t	Venue ID
CFICode[PM]	char [7]	ISO 10962 Security Type
StrikePrice[PM]	GMACPrice	Strike price
StrikeCurrency[PM]	GMACCurrency	Strike currency
StrikePriceFactor[PM]	GMACPriceFactor	Price factor used for the strike price. If not defined use price factor found in reference header.
MaturityYear[PM]	uint16_t	Instrument maturity year
MaturityMonth[PM]	uint16_t	Instrument maturity month
MaturityDay[PM]	uint16_t	Instrument maturity day
LastTradeDate[PM]	uint32_t	Instrument last trading date in YYYYMMDD format
LastTradeTime[PM]	uint64_t	Instrument last trading time for the instrument last trading date in HH:MM:SS.XXX format
ActivationDate[PM]	uint32_t	Instrument activation date in YYYYMMDD format
ActivationTime[PM]	uint64_t	Instrument activation time for the instrument activation date in HH:MM:SS.XXX format
NumOfMarkets[PM]	uint16_t	Number of option markets for the given market type
ExpirationType[PM]	char	Expiration type Possible values: 'M' Monthly 'D' Daily
PricingModel[PM]	char	Pricing model Possible values: 'F' Fisher-Black 'W' Whaley
MatchAlgorithm[PM]	char	Matching algorithm Possible values: 'F' FIFO 'A' Allocation 'C' Currency calendar 'T' Lead market maker with top 'S' Lead market maker without top 'X' LMM pro-rata 'Y' LMM pro-rata with top percentage, top min eligible and top max 'N' NYMEX LMM allocation 'O' Pro-rata with top order percentage allocation 'Q' Pro-rata with top percentage allocation and LMM

Field	Type	Description
		'K' Split FIFO / pro-rata
ClosingType[PM]	ClosingType	Additional closing types (bit fields) for the instrument (market specific)
UnderlyingCount	int	Number of underlying securities The following group of 4 fields are repeated UnderlyingCount times
►UnderlyingIDs[]. UnderlyingIDLink	GMACUnderlyingID	Underlying ID
►UnderlyingIDs[].Side[PM]	GMACSide	Side
►UnderlyingIDs[]. RatioQuantity[PM]	uint32_t	Ratio quantity
►UnderlyingIDs[]. OptionDelta[PM]	uint64_t	Option delta

1.3.28 Underlying ID Structure

Description Underlying ID structure.

It is used in structure GMACMessageDerivativeHeaderV3 and in message GMACMessageReferenceSecurityV3.

Structure GMACUnderlyingID

The structure description is as follows:

Field	Type	Description
Length	uint8_t	Length of the value stored in bytes
Bytes	uint8_t	An array of size specified by Length containing the UnderlyingID binary value. Maximum length is GMAC_UNDERLYINGID_MAX_LENGTH

1.3.29 Order Validity Structure

Description This structure contains bit fields to provide additional market specific closing types for derivatives instruments.

It is used in message GMACMessageDerivativeHeaderV3.

Structure ClosingType

The available fit fields are as follows:

Field	Used in GMAC plugins
NormalHours	PHLXTOPOPLUS
ExtendedHours	PHLXTOPOPLUS

1.4 Consolidated Generic Messages

This section describes the consolidated generic and normalized GMAC messages.

1.4.1 Underlying Value Message

Description This message is used to provide information about underlying values.

Structure GMACCMessageIndexV3

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
InstrumentIndex[PM]	GMACInstrumentIndex	Instrument ID If present, InstrumentName will not be present
InstrumentName[PM]	GMACInstrumentName	Instrument name If present, InstrumentIndex will not be present
IndexValue[PM]	GMACPrice	Value of the index's calculation formula using the current last traded values of the component securities
BidIndexValue[PM]	GMACPrice	Value of the index's calculation formula using the current Bid values of the component securities
AskIndexValue[PM]	GMACPrice	Value of the index's calculation formula using the current ask values of the component securities
OrigCategory[PM]	char	Original message category

1.4.2 OHLC Message

Description This message is used to provide information about prices.

Structure GMACCMessageOHLCV3

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
InstrumentIndex[PM]	GMACInstrumentIndex	Instrument ID If present, InstrumentName will not be present
InstrumentName[PM]	GMACInstrumentName	Instrument name If present, InstrumentIndex will not be present
VenueID	GMACVenueID	Source venue
Open[PM]	GMACPrice	Opening price
High[PM]	GMACPrice	Highest price
Low[PM]	GMACPrice	Lowest price
Close[PM]	GMACPrice	Closing price
Last[PM]	GMACPrice	Last traded price
Currency[PM]	GMACCurrency	Currency code
OrigCategory[PM]	char	Original message category

1.4.3 Session Message

Description The session message is used to provide information about market sessions. Each session starts with this message. The action type is set to either 'S' or 'M' depending on whether there are some missing messages from the

beginning of the session. The end of session is marked with action type ‘E’ and it is the last message of that session.

Structure GMACCMessageSessionV3

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
ActionType	char	Action type Possible values: ‘S’ Start of day ‘E’ End of day ‘M’ Mid-day start

1.4.4 SHO Short Sale Price Restriction Message

Description This message is used to provide information about short sale restrictions.

Structure GMACCMessageSHOShortSalePriceRestrictionV3

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
InstrumentIndex[PM]	GMACInstrumentIndex	Instrument ID If present, InstrumentName will not be present
InstrumentName[PM]	GMACInstrumentName	Instrument name If present, InstrumentIndex will not be present
VenueID[PM]	GMACVenueID	Source venue
SHOShortRestr	char	Short sale restriction indicator Possible values: ‘Y’ Restricted ‘N’ Not restricted
OrigCategory[PM]	char	Original message category

1.4.5 Top of Book Update Message

Description This message is used to provide information about order updates.

Structure GMACCMessageTOBV3

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
InstrumentIndex[PM]	GMACInstrumentIndex	Instrument ID If present, InstrumentName will not be present
InstrumentName[PM]	GMACInstrumentName	Instrument name If present, InstrumentIndex will not be present
BackgroudInfo[PM]	void*	Pointer to background info of the instrument. Not implemented yet.
NoBestMask[PM]	uint8_t	Bit mask specifying indicators for which no

Field	Type	Description
		BBO value can be calculated at present
OrigCategory[PM]	char	Original message category
LULDIndicator[PM]	GMACCLULDIndicatorV3	Limit Up Limit Down BBO indicator. Describes whether or not the participant quotation is executable within the context of the price band for the issue.
LULDNationalIndicator[PM]	GMACCLULDNationalIndicatorV3	Limit Up Limit Down national indicator. Describes the limit state of the NBBO with respect to the price band for the issue.
FinraLULDIndicator[PM]	GMACCLULDFinraIndicatorV3	FINRA BBO Limit Up Limit Down indicator. Indicates the effect that the LULD price bands have on the FINRA best bid and FINRA best offer.
RetailInterest[PM]	GMACCRetailInterestV3	Retail interest indication on the bid, ask or both the bid and ask.
OrderCount	int	Number of orders present in the message The following group of 6 fields are repeated OrderCount times
►**Orders[]**	GMACCOrderDataV3	An array of orders

1.4.6 Trade Cancellation Message

Description This message is used to provide information about trade cancellations.

Structure GMACCMessageTradeCancellationV3

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
InstrumentIndex[PM]	GMACInstrumentIndex	Instrument ID If present, InstrumentName will not be present
InstrumentName[PM]	GMACInstrumentName	Instrument name If present, InstrumentIndex will not be present
ActionType	char	Action type Possible values: 'C' Cancel 'E' Error
TradeMessageSequenceNumber[PM]	uint64_t	Sequence number of the message being cancelled
Currency[PM]	GMACCurrency	Currency
OriginalTrade	GMACCOrderDataV3	Original trade information
OrigCategory[PM]	char	Original message category

1.4.7 Trade Correction Message

Description This message is used to provide information about trade corrections.

Structure GMACCMessageTradeCorrectionV3

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
InstrumentIndex[PM]	GMACInstrumentIndex	Instrument ID If present, InstrumentName will not be present
InstrumentName[PM]	GMACInstrumentName	Instrument name If present, InstrumentIndex will not be present
TradeMessageSequenceNumber	uint64_t	Sequence number of the message being changed
Currency[PM]	GMACCurrency	Currency
OrigCategory[PM]	char	Original message category
OriginalTrade	GMACCOrderDataV3	Original trade information
CorrectedTrade	GMACCOrderDataV3	Corrected trade information

1.4.8 Trade Message

Description This message is used to provide information about trades.

Structure GMACCMessageTradeV3

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
InstrumentIndex[PM]	GMACInstrumentIndex	Instrument ID If present, InstrumentName will not be present
InstrumentName[PM]	GMACInstrumentName	Instrument name If present, InstrumentIndex will not be present
MarketPCI[PM]	GMACCPriceChIndV3	Price Change Indicator bit field indicating which price values are affected for this venue by the trade
ConsolidatedPCI[PM]	GMACCPriceChIndV3	Price Change Indicator bit field indicating which consolidated price values are affected by the trade
Trade	GMACCOrderDataV3	Executed trade
Currency[PM]	GMACCurrency	Currency
TradeFlags	TradeFlags	Additional flags for the trade (bit fields)
OrigCategory[PM]	char	Original message category

1.4.9 Trading Status Message

Description This message is used to provide information about trading status changes.

Structure GMACCMessageTradingStatusV3

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
InstrumentIndex[PM]	GMACInstrumentIndex	Instrument ID If present, InstrumentName will not be present

Field	Type	Description
InstrumentName[PM]	GMACInstrumentName	Instrument name If present, InstrumentIndex will not be present
VenueID[PM]	GMACVenueID	Source venue
TradingStatus	GMACTradingStatus	Trading status
OrigCategory[PM]	char	Original message category

1.4.10 Limit Up Limit Down Price Band Message

Description This message is used to provide Limit Up and Limit Down LULD intended to address extraordinary market volatility in NMS stocks.

Structure GMACCMessageLULDPriceBandV3

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
InstrumentIndex[PM]	GMACInstrumentIndex	Instrument ID If present, InstrumentName will not be present
InstrumentName[PM]	GMACInstrumentName	Instrument name If present, InstrumentIndex will not be present
VenueID[PM]	GMACVenueID	Source venue
PriceBandIndicator[PM]	GMACCLULDPriceBandV3	LULD price band indicator. Denotes the event that initiated the price band message being disseminated.
TimeEffective[PM]	uint64_t	LULD price band effective time. Denotes the time in nanoseconds since midnight that the price band originally became effective.
LimitDownPrice[PM]	GMACPrice	Limit down price. Represents the lower boundary of the price range for executable quotes.
LimitUpPrice[PM]	GMACPrice	Limit up price. Represents the upper boundary of the price range for executable quotes.
OrigCategory[PM]	char	Original message category

1.4.11 Market Wide Circuit Breaker Message

Description This message is used to provide Market Wide Circuit Breaker MWCB breach points which are set for the current trading day.

Structure GMACCMessageMWCBV3

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
LevelOne[PM]	GMACPrice	MWCB level 1
LevelTwo[PM]	GMACPrice	MWCB level 2
LevelThree[PM]	GMACPrice	MWCB level 3

1.4.12 Market Wide Circuit Breaker Status Message

Description This message is used to inform when a Market Wide Circuit Breaker MWCB has breached one of the established levels.

Structure GMACCMessageMWCBStatusV3

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
Status[PM]	GMACCMWCBStatusV3	MWCB level that has been breached

1.4.13 Order Information Structure

Description This structure contains data about an order from the feed.

It is used in messages GMACCMessageTOBV3, GMACCMessageTradeV3, GMACCMessageTradeCorrectionV3 and GMACCMessageTradeCancellationV3.

Structure GMACCOrderDataV3

The structure description is as follows:

Field	Type	Description
VenueID	GMACVenueID	Source venue
BestMask	uint8_t	Bit mask specifying by which indicators was this order marked as the best
DeletedFlag	uint8_t	Flag indicating that no BBO is available for the venue
Side	GMACSide	Side
Quantity	GMACQuantity	Order quantity
Price	GMACPrice	Order price
QuoteCondition	char [2]	Quote condition forwarded from the exchange (used for orders). First character determines the exchange: 'C' CQS 'O' OPRA 'U' UQDF '\0' None Second character is the value from the exchange.
SaleCondition	char [5]	Sale condition forwarded from the exchange (used for trades). First character determines the exchange: 'S' CTS 'F' UTDF '\0' None Second character is the value from the exchange.

1.4.14 Options Background Information Structure

Description This structure contains background information for options in OPRA. It carries detailed description of the instrument as published by OPRA. Note that there are no optional fields in this message - i.e. all the fields are always populated.

This structure is physically located just after the GMAC message that points to it. The GMAC message length is adjusted accordingly.

Structure GMACOpraBackgroundInfoV3

The structure description is as follows:

Field	Type	Description
ExpirationDay	uint8_t	Expiration day (1 to 31)
ExpirationMonth	uint8_t	Expiration month (1 to 12)
ExpirationYear	uint16_t	Expiration year, YYYY format
StrikePrice	GMACPrice	Strike price
CFICode	char [7]	ISO 10962 security type

1.4.15 Price Change Indicator Structure

Description This structure indicates whether a trade should update values either for the individual market or consolidated for all markets.

Structure GMACCPriceChIndV3

The structure description is as follows:

Field	Type	Description
Open^{PM}	unsigned	Opening price
Close^{PM}	unsigned	Closing price
Last^{PM}	unsigned	Last traded price
Low^{PM}	unsigned	Lowest price
High^{PM}	unsigned	Highest price

1.4.16 Trade Flags Structure

Description This structure contains bit fields to provide additional market specific trade flags.

It is used in message GMACCMessageTradeV3.

Structure TradeFlags

The available fit fields are as follows:

Field	Used in GMAC plugins
LateMessage	OPRA OPRA_BINARY
OutOfSequence	OPRA OPRA_BINARY

1.5 CME Specific Messages

This section describes the CME specific GMAC messages.

Refer to the GMAC CME V3 mapping specifications for more details.

1.5.1 Feed Type Extension Message

Description This message is the CME security definition repeating Group extension message, issued as an extension to the generic messages Reference Security.

Structure GMACExtensionCME2FeedType

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
ExtensionType	CME2ExtensionType	CME2SecDefRepeatGroupFeedType
MDFeedType	char [4]	Describes a class of service for a given data feed Possible values: 'GBX' Globex Book Depth 'GBI' Globex Implied Book Depth
MarketDepth	uint32_t	Identifies the depth of book

1.5.2 Instrument Attribute Extension Message

Description This message is the CME security definition repeating Group extension message, issued as an extension to the generic messages Reference Security.

Structure GMACExtensionCME2InstrAttrib

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
ExtensionType	CME2ExtensionType	CME2SecDefRepeatGroupInstrAttrib
InstrAttribType	uint32_t	Possible values: 23 Variable Tick Table 24 Eligibility 25 Main Fraction 26 Sub Fraction 27 Display Price Precision
InstrAttribValue	char [3]	For **InstrAttribType** =23 Variable Tick Table Index Possible values: Current values from 01 to 12 For **InstrAttribType** =24: Possible values: 1 Electronic Match Eligible 2 Order Cross Eligible 3 Block Trade Eligible 4 EFP Eligible 5 EBF Eligible 6 EFS Eligible 7 EFR Eligible 8 OTC Eligible 9 iLink Indicative Mass Quoting Eligible 10 Negative Strike Eligible 11 Negative Price Outright Eligible 12 Is Fractional 13 Volatility Quoted Option 14 RFQ Cross Eligible 16 Zero Price Outright Eligible 17 Decaying Product Eligibility 18 Variable Product Eligibility 19 Daily Product Eligibility

Field	Type	Description
		For **InstrAttribType** =25 Price Denominator of Main Fraction For **InstrAttribType** =26 Price Denominator of Sub Fraction For **InstrAttribType** =27 Number of Decimals in Displayed Price

1.5.3 Main Security Definition Extension Message

Description This message is the CME main security definition extension message, issued as an extension to the generic messages Reference Security.

Structure GMACExtensionCME2SecDefMain

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
ExtensionType	CME2ExtensionType	CME2SecDefMain
TotNumReports	uint32_t	Total number of reports returned in response to a request
NoMDFeedType	uint32_t	Number of repeating FeedType repeating group entries
NoInstrAttrib	uint32_t	Number of repeating group InstrAttribType entries
UserDefinedInstrument	char	Identifies user-defined instruments. If the tag is not present, the instrument is not user-defined. Possible values:
		'Y' User defined instrument 'N' Not a user defined instrument
ClearedVolume[PM]	GMACQuantity	Indicates the total cleared volume of instruments traded during the prior trading session
OpenInterestGMACQuantity[PM]	GMACQuantity	Indicates the total open interest for the market at the close of the prior trading session
SecurityExchange[PM]	char	Market used to help identify a security Possible values: XCBT Chicago Board Of Trade XCME Chicago Mercantile Exchange XNYM New York Mercantile Exchange XCEC Commodities Exchange Center XKBT Kansas City Board Of Trade XMGE Minneapolis Grain Exchange DUMX Dubai Mercantile Exchange XBMF BM&F BOVESPA SA XMEX Bolsa Mexicana de Valores XKLS Bursa Malaysia XKRX Korea Exchange GREE the Green Exchange NYUM NYMEX vs DME Inter-Exchange
SecuritySubType[PM]	char	Strategy type
AppIID[PM]	char	The channel ID
PriceRatio[PM]	GMACPrice	Used for price calculation in spread and leg pricing

Field	Type	Description
ContractMultiplierUnit[PM]	uint32_t	Indicates the type of multiplier being applied to the product. Optionally used in combination with ContractMultiplier. Possible values: 1 Multiplied by hour 2 Multiplied by day
ContractMultiplier[PM]	uint32_t	Number of deliverable units per instrument, e.g., peak days in maturity month or number of calendar days in maturity month
FlowScheduleType[PM]	uint32_t	The schedule according to which the electricity is delivered in a physical contract, or priced in a financial contract. Specifies whether the contract is defined according to the Eastern Peak, Eastern Off-Peak, Western Peak or Western Off-Peak Possible values: 0 NERC Eastern Off-Peak 1 NERC Western Off-Peak 2 Calendar-All Days in month 3 NERC Eastern Peak 4 NERC Western Peak
UnderlyingProduct	uint32_t	Indicates the product complex Possible values: 2 Commodity/ Agriculture 4 Currency 5 Equity 12 Other 14 Interest Rate 15 FX Cash
		16 Energy 17 Metals
SettlCurrency[PM]	GMACCurrency	Identifies currency used for settlement price
MinLotSize_BlockLot[PM]	GMACQuantity	Minimum block lot quantity accepted for order entry
MinLotSize_RoundLotVar[PM]	GMACQuantity	Minimum round lot (variable quantity products) quantity accepted for order entry
OriginalContractSize[PM]	GMACQuantity	Original contract size

1.5.4 Security Definition Legs Information Extension Message

Description This message is the CME security definition repeating legs information extension message, issued as an extension to the generic messages Reference Security.

Structure GMACExtensionCME2LegInformation

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
ExtensionType	CME2ExtensionType	CME2SecDefRepeatLegInformation
LegSecuritySubType	char [5]	Leg security sub-type

1.5.5 Packet Header Extension Message

Description This message is used as an extension to every packet.

Structure GMACExtensionCME2PacketHeader

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
ExtensionType	CME2ExtensionType	CME2PacketHeader
TemplateID	uint32_t	Template ID
FASTDecoded	uint8_t	Indicates whether the packet has been hardware-decoded or not

1.6 ICE Specific Messages

This section describes the ICE specific GMAC messages.

Refer to the GMAC ICE V3 mapping specifications for more details.

1.6.1 Message B Extension Message

Description This message is the ICE message 'B' extension, issued as an extension to the generic messages Reference Security.

Structure GMACExtensionICEMessageB

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
ExtensionType	ICEExtensionType	ICEMessageB
AllowOptions	char	Indicate if the market supports option markets Possible values: 'Y' Yes 'N' No
IsSpread	char	Indicate if the market is a spread
IsCrackSpread	char	Indicate if the market is crack spread
RequestMarketType	uint16_t	Market type
ProductID	uint16_t	ID of the product that the contract/market is under
ProductName	char [62]	Name of the product that the contract/market is under
HubID	uint16_t	ID of the hub for the contract/market
HubAlias	char [80]	Alias of the hub for the contract/market
PrimaryMarketID^{PM}	uint32_t	Ignored when it is not spread
SecondaryMarketID^{PM}	uint32_t	Ignored when it is not spread
TickValue	uint64_t	OrderPriceDenominator should be applied to get the real value
MinPrice	int64_t	Minimum Price
MaxPrice	uint64_t	Maximum Price
StripID	uint16_t	ID of the strip for the contract/market
StripName	char [39]	Name of the strip for the contract/market
ClearedAlias	char [15]	Clearing limit admin related
MarketDesc	char [120]	Description of the market
SettlePriceFactor	GMACPriceFactor	Settlement price denominator

1.6.2 Message p Extension Message

Description This message is the ICE message 'p' extension, issued as an extension to the generic messages Reference Security.

Structure GMACExtensionICEMessagep

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
ExtensionType	ICEExtensionType	ICEMessagep
MinGMACQuantity	GMACQuantity	Minimum quantity for this market

Field	Type	Description
MarketDesc	Char [120]	Description of the market
MinOptionsPrice	uint64_t	Minimum premium price for the option.
MaxOptionsPrice	uint64_t	Maximum premium price for the option
IncrementPremiumPrice	uint64_t	Price increment for the option market.
RequestMarketType	uint64_t	Market type
SettlePriceFactor	GMACPriceFactor	Settlement price denominator

1.6.3 Message W Extension Message

Description This message is the ICE message 'W' extension, issued as an extension to the generic messages OHLC.

Structure GMACExtensionICEMessageW

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
ExtensionType	ICEExtensionType	ICEMessageW
UnderlyingMarketID	uint32_t	Market ID of the underlying
TradeID	uint64_t	Trade ID
Price	GMACPrice	Trade price
Quantity	GMACQuantity	Trade quantity
OffMarketTradeType	char	Only for off market trade. The value is ' ' when it is a regular trade.
		Possible values: 'K' Block trade 'E' EFP trade 'S' EFS trade 'V' Bilateral off-exchange trade 'O' NG EFP/EFS trade '9' CCX EFP trade 'J' EFR trade 'Q' EOO trade 'I' EFM trade
TransactDateTime	uint64_t	Deal date time
OptionType	char	Option type Possible values: '1' Call '2' Put
StrikePrice	GMACPrice	Strike price
EventCode	char	Event code Possible values: '0' Normal trade '1' Cancelled trade '2' Adjusted trade

1.6.4 Message V Extension Message

Description This message is the ICE message 'V' extension. It is not appended to any other GMAC message.

Structure GMACExtensionICEMessageV

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	

Field	Type	Description
ExtensionType	ICEExtensionType	ICEMessageV
InstrumentIndex	GMACInstrumentIndex	Instrument ID
IPLHoldType	char	IPL hold type Possible values: 'S' IPL Hold Start 'E' IPL Hold End
NotificationdateTime	uint64_t	Date time of the IPL notification
IsUp[PM]	char	Possible values: 'Y' IPL Upper bound violation (Bidding too high) 'N' IPL Lower bound violation (Asking too low) N/A when IPLHoldType = 'E'
IPLHoldDuration[PM]	uint32_t	Hold duration, in milliseconds. N/A when IPLHoldType = 'E'
IPLUp[PM]	uint64_t	IPL upper bound. N/A when IPLHoldType = 'E'
IPLDown[PM]	uint64_t	IPL lower bound. N/A when IPLHoldType = 'E'

1.6.5 Extra Information Extension Message

Description This message is an ICE extension message carrying non-normalized information.

Structure GMACExtensionICEExtraInfo

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
ExtensionType	ICEExtensionType	ICEExtraInfo
OpenInterestDate[PM]	char [11]	Open interest effective date
OpenInterestChange[PM]	int32_t	Open interest change
IsRFCCrossing[PM]		Indicates this is a RFC crossing
IsLegDealOutsideIPL[PM]		Indicates the deal is outside of IPL

1.7 EUREX Specific Messages

This section describes the Eurex specific GMAC messages.

Refer to:

- GMAC Eurex V3 mapping specifications for the Eurex Enhanced Broadcast Solution EBS
- GMAC Eurex New Trading Architecture mapping specifications for both Eurex Enhanced Market Data Interface EMDI and Eurex Market Data Interface MDI

1.7.1 Packet Header Extension Message

Description This message is used to provide the original Eurex Enhanced Broadcast Solution EBS packet header.

Structure GMACExtensionStructPacketHeader

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
ExtensionType	EurexExtensionType	EurexPacketHeader
MajorRelease[PM]	uint32_t	Eurex major release number
SenderCompID[PM]	uint32_t	Identifies the Eurex broadcast instance from which this packet is originated. Present only for R14.
PacketSeqNum[PM]	uint64_t	Packet sequence number. Present for both R13 and R14.
Timestamp[PM]	uint64_t	Time at which this packet left the Eurex host, specified in microseconds since midnight.
		Present only for R14.
PerformanceIndicator[PM]	uint32_t	Eurex host performance indicator. Present only for R14.

1.7.2 Packet Enhanced MDI Header Extension Message

Description This message is used to provide the original Eurex New Trading Architecture packet header.

Structure GMACExtensionStructEurexEMDIPacketHeader

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
ExtensionType	EurexExtensionType	EurexEMDIPacketHeader
PartitionID[PM]	uint32_t	Sending partition. Present only for Eurex EMDI.
SenderCompID[PM]	uint32_t	Unique ID for a sender
PacketSeqNum[PM]	uint64_t	Packet sequence number
SendingTime[PM]	uint64_t	Time when market data feed handler writes packet on the wire
PerformanceIndicator[PM]	uint32_t	Current load of system. Present only for Eurex EMDI.

1.7.3 Product Reference Extension Message

Description This message is used to provide extra product reference data and

delta/snapshot IP details.

Structure GMACExtensionStructEurexProdRef

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
ExtensionType	EurexExtensionType	EurexProdRef
NoCont	uint32_t	Number of contracts for the product
ISIN	char [15]	ISIN code of the product
ExPrc	uint64_t	Exercise price decimals
GatewayLocID	char	Logical identifier for the gateway location processing the product
DA	GMACExtensionStructEurexIPPort	Delta service A
DB	GMACExtensionStructEurexIPPort	Delta service B
SA	GMACExtensionStructEurexIPPort	Snapshot service A
SB	GMACExtensionStructEurexIPPort	Snapshot service B

1.7.4 Feed Reference Extension Message

Description This message is used to provide feed reference data and IP details for the Eurex New Trading Architecture.

Structure GMACExtensionStructEurexFeedRef

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
ExtensionType	EurexExtensionType	EurexFeedRef
ISIN	char [15]	ISIN code of the product
PartitionID	uint32_t	Partition of the product
MarketDepth[PM]	uint32_t	Maximum number of price levels for the product.
Primary	GMACExtensionStructEurexIPPort	IP details for service A
Secondary[PM]	GMACExtensionStructEurexIPPort	IP details for service B

1.7.5 Order Depth Extension Message

Description This message is used to provide the last trade price sequence number.

Structure GMACExtensionStructEurexOrderDepth

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
ExtensionType	EurexExtensionType	EurexOrderDepth
LastTpSeqNum[PM]	uint32_t	Last trade price sequence number

1.7.6 Trade Extension Message

Description This message is used to provide trade details.

Structure GMACExtensionStructEurexTrade

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
ExtensionType	EurexExtensionType	EurexTrade
AggressorEntTime[PM]	int64_t	Indicates the time at which the incoming order that caused the trade entered the Eurex Host (matching engine)
TpSeqNum[PM]	uint32_t	Trade sequence number
TrdEventSeqNum[PM]	uint32_t	Trade event sequence number
RevInd[PM]	char	Trade reversal indicator
TradeType[PM]	char	Trade type
TradeInd[PM]	char	Additional information on the trade price type
NoOfTrnIdNo	uint32_t	Number of legs
►TrnId[]	char [16]	Trade identifier for one of the posting legs involved in this trade. Zero-terminated string.

1.7.7 IP Address and Port Structure

Description This structure holds stream IP address details.

It is used in:

- Eurex specific messages GMACExtensionStructEurexProdRef and GMACExtensionStructEurexFeedRef
- XETRA specific messages GMACExtensionStructXetraInstrRef and GMACExtensionStructXetraMaintRef

Structure GMACExtensionStructEurexIPPort

The structure description is as follows:

Field	Type	Description
MID	GMACMulticastID	Multicast ID
Type	EurexXetraStreamType	Stream type
Service	char	Stream service type
IP	char [16]	IP address
Port	uint16_t	Port

1.8 XETRA Specific Messages

This section describes the XETRA specific GMAC messages.

Refer to the GMAC XETRA V3 mapping specifications for more details.

1.8.1 Packet Header Extension Message

Description This message is used to provide the original Xetra packet header.

Structure GMACExtensionStructXetraPacketHeader

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
ExtensionType	EurexExtensionType	XetraPacketHeader
MajorRelease[PM]	uint32_t	XETRA major release number
SenderCompID[PM]	uint32_t	Source ID type
PacketSeqNum[PM]	uint64_t	Packet sequence number
Timestamp[PM]	uint64_t	Time at which this packet left the XETRA host, specified in microseconds since midnight
PerformanceIndicator[PM]	uint64_t	XETRA host performance indicator

1.8.2 Instrument Reference Data Extension Message

Description This message is used to provide extra instrument reference data.

Structure GMACExtensionStructXetraInstrRef

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
ExtensionType	EurexExtensionType	XetraInstrRef
ISIN	char [15]	ISIN code of the product
InstrumentGroup	char [15]	Instrument group
StreamCount	int	Number of streams
►**Streams[6]**	GMACExtensionStructEurexIPPort	

1.8.3 Maintenance Reference Data Extension Message

Description This message is used to provide extra maintenance reference data.

Structure GMACExtensionStructXetraMaintRef

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
ExtensionType	EurexExtensionType	XetraMaintRef
Exchange	char [5]	Exchange ID
Segment	char [5]	Exchange segment ID
StreamCount	int	Number of streams
►**Streams[2]**	GMACExtensionStructEurexIPPort	

1.8.4 Trade and OHLC Extension Message

Description This message is used to provide extra trade and OHLC data.

Structure GMACExtensionStructXetraTradeOHLC

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
ExtensionType	EurexExtensionType	XetraTradeOHLC
Isix	uint32_t	Instrument identifier
TpSeqNum	uint32_t	Sequence number

1.9 Hotspot FX Specific Messages

This section describes the Hotspot FX specific GMAC messages.

Refer to the GMAC Hotspot FX V3 mapping specifications for more details.

1.9.1 Order Information Extension Message

Description This message is used to provide order details.

Structure GMACExtensionStructHotspotFXOrderInfo

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
ExtensionType	HotspotFXExtensionType	HotspotFXOrderInfo
MinQty[PM]	GMACQuantity	Minimum quantity
LotSize[PM]	GMACQuantity	Lot Size

1.10 LIFFE & LIFFE US Specific Messages

This section describes the Liffe & Liffe US specific GMAC messages.

Refer to the GMAC NYSE Liffe XDP and GMAC NYSE Liffe US XDP V3 mapping specifications for more details.

1.10.1 Refresh Extension Message

Description This message is the Liffe start / end refresh indicator extension message.

Structure GMACExtensionStructLiffeRef

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
ExtensionType	XDPExtensionType	LiffeRef
Status	char	'E' End refresh flag
Seq	uint32_t	Holds LastSeqNum from XDP EndRefresh message

1.10.2 Market Modes Extension Message

Description This message is the Liffe market modes extension message.

Structure GMACExtensionStructLiffeMS

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
ExtensionType	XDPExtensionType	LiffeMS
Modes	GMACLiffeModes	Set of market modes, 10 bytes array

1.10.3 Throttle Size Extension Message

Description This message is the Liffe throttle size extension message.

Structure GMACExtensionStructLiffeThottleSize

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
ExtensionType	XDPExtensionType	LiffeThrottleSize
ThrottleSize	uint32_t	Throttle size

1.11 ISE MDI Specific Messages

This section describes the ISE MDI specific GMAC messages.

Refer to the GMAC ISE MDI V3 mapping specifications for more details.

1.11.1 Product Info Extension Message

Description This message provides the market segment ID when this piece of information is not provided in the ISE MDI streams.

Structure GMACExtensionISEMDIProductInfo

The message description is as follows:

Field	Type	Description
Head	GMACMessageHeader	
ExtensionType	ISEMDIExtensionType	ISEMDIProductInfo
SegmentID	uint32_t	MarketSegmentID, tag [1300]

2. Format

2.1 Field Types

The following table provides the des description of generic field types:

Type	Type	Comments
GMACPrice	uint64_t	Depending on feed, the price is usually shifted to GMAC_DECIMAL_PLACES digits fixed point. The price 12.34 is coded as 1234000000
GMACQuantity	uint64_t	Quantity is usually shifted to GMAC_DECIMAL_PLACES digits fixed points. The quantity 12.34 is coded as 1234000000
GMACOrderID	uint64_t	Any Order ID in the feed is uniquely coded into 64 bits
GMACTradeID	uint64_t	Trade ID type
GMACTraderID	uint64_t	Trader ID type
GMACPriceFactor	Opaque structure	Price factors are corrected, so that dividing the native price gives a number with GMAC_DECIMAL_PLACES fixed decimal places
GMACInstrumentIndex	char [GMAC_INSTUMENT_MAX_LENGTH]	Two instrument index types: • Instrument index, null terminated C string, starting with '#'. Null termination is only applicable if the instrument index is smaller than GMAC_INSTRUMENT_MAX_LENGTH • instrument binary index starting with '/', the second byte is the length of the following array of characters
GMACInstrumentName	char [GMAC_INSTUMENT_MAX_LENGTH]	Instrument name, null terminated C string, starting with any alpha numeric character. Null termination is only applicable if the instrument name is smaller than GMAC_INSTRUMENT_MAX_LENGTH
GMACMulticastID	uint32_t	
GMACChannelID	uint32_t	
GMACCurrency	char [GMAC_MAX_CURRENCY_LENGTH]	
GMACUnit	char [GMAC_UNIT_MAX_LENGTH]	
GMACVenueID	uint8_t	

2.2 Enumerations

The following table provides the possible values of enumerations:

Enumeration	Values	Description
GMACTradingStatus	**TSTATUS_UNKNOWN**	Unknown or invalid
	TSTATUS_CLOSE	Closed
	TSTATUS_SUSPEND	Suspended or halted
	TSTATUS_QUOTE	Quotation only
	TSTATUS_EXTEND	Extended market hours
	TSTATUS_OPEN	Open
GMACExchTradingStatus	**ESTATUS_CME_TRADING_HALT**	Trading halt (CME)
	ESTATUS_CME_PRICE_INDICATION	Price indication (CME)
	ESTATUS_CME_READY_TO_TRADE	Ready to trade (CME)
	ESTATUS_CME_NOT_AVAILABLE_FOR_TRADING	Not available for trading (CME)
	ESTATUS_CME_UNKNOWN_OR_INVALID	Unknown or invalid (CME)
	ESTATUS_CME_PRE_OPEN	Pre-open (CME)
	ESTATUS_CME_OPENING_ROTATION	Opening rotation (CME)
	ESTATUS_CME_PRE_CROSS	Pre-cross (CME)
	ESTATUS_CME_CROSS	Cross (CME)
	ESTATUS_CME_NO_CANCEL	No-cancel (CME)
GMACCycleStatus	**CSTATUS_NONE**	Reset
	CSTATUS_START_CYCLE1	Start of cycle 1 (Eurex EBS product reference)
		Start of reference data (Eurex New Trading Architecture)
		Start of reference (XETRA)

	CSTATUS_END_CYCLE1	End of cycle 1 (Eurex EBS product reference)
		End of reference data (Eurex New Trading Architecture)
		End of reference (XETRA)
	CSTATUS_START_CYCLE2	Start of cycle 2 (Eurex EBS SglLeg reference)
		Start of maintenance (XETRA)
	CSTATUS_END_CYCLE2	End of cycle 2 (Eurex EBS Leg reference)
		End of maintenance (XETRA)
	CSTATUS_START_CYCLE3	Start of cycle 3 (Eurex EBS strategy reference)
	CSTATUS_END_CYCLE3	End of cycle 3 (Eurex EBS strategy reference)
	CSTATUS_END_OF_CYCLES	End of cycles (Eurex EBS, Eurex New Trading Architecture, XETRA)
GMACLiffeModes	**LMM_Closed**	1
	LMM_ExPitExtendOpen	4
	LMM_Halted	6
	LMM_Open	7
	LMM_PreClosed	8
	LMM_PreOpen	9
	LMM_PriceLimitsEnabled	10
	LMM_PriceLimitsDisabled	11
	LMM_RestrictedOpen	12
	LMM_Session1	13
	LMM_Session2	14
	LMM_Session3	15
	LMM_QuoteWidthExemption1	23
	LMM_QuoteWidthExemption2	24
	LMM_QuoteWidthExemption3	25

	LMM_DarkSeries	28
	LMM_LightSeries	29
	LMM_TradingUnhalt	30
	LMM_Terminate	31
	LMM_UnTerminate	32
	LMM_Expire	39
	LMM_PreExpiry	40
	LMM_Hold	41
	LMM_Unhold	42
GMACPriceType	**PTYPE_PRELIMINARY_SETTLEMENT**	Preliminary settlement price
	PTYPE_FINAL_REAL_SETTLEMENT	Final real settlement price
	PTYPE_FINAL_THEORETICAL_SETTLEMENT	Final theoretical settlement price
	PTYPE_Provisional_Daily	Provisional daily
	PTYPE_Official_Daily	Official daily
	PTYPE_Provisional_Market_Close	Provisional market close
	PTYPE_Official_Market_Close	Official market close
	PTYPE_Provisional_Expiry	Provisional expiry
	PTYPE_Official_Expiry	Official expiry
	PTYPE_Provisional_IntraDay	Provisional intraday
	PTYPE_Official_IntraDay	Official intraday
	PTYPE_Official_YDSP	Official YDSP
	PTYPE_FINAL_DAILY_SETTLEMENT_PRICE	Final daily settlement price
	PTYPE_FINAL_REAL_OPEN_PRICE	Final real open price
	PTYPE_FINAL_THEORETICAL_OPEN_PRICE	Final theoretical open price
GMACSide	**SIDE_ASK**	Ask side (-1)

	SIDE_BID	Bid side (1)
	SIDE_UNKNOWN	Unknown (0)
GMACCustomQuantityType	**GMAC_CUSTOM_QUANTITY_TYPE_ALL_OR_NONE**	All or none quantity type
	GMAC_CUSTOM_QUANTITY_TYPE_CUSTOMER	Customer quantity type
	GMAC_CUSTOM_QUANTITY_TYPE_CUSTOMER_ALL_OR_NONE	Customer all or none quantity type
	GMAC_CUSTOM_QUANTITY_TYPE_CUSTOMER_PROFESSIONAL	Customer professional quantity type
	GMAC_CUSTOM_QUANTITY_TYPE_IMPLIED	Implied quantity type
GMACDataType	**GMAC_DATA_TYPE_UNKNOWN**	Unknown data type
	GMAC_DATA_TYPE_SNAPSHOT	Snapshot data type
	GMAC_DATA_TYPE_LIVE	Live data type
GMACShortSaleRestriction	**REGSHO_IN_EFFECT**	RegSHO short sale price restriction in effect or remains in effect
	REGSHO_NOT_IN_EFFECT	No short sale price restriction
GMACMessageType	**GMAC_TYPE_IMBALANCE_V3**	Imbalance message
	GMAC_TYPE_INFORMATION_V3	Information message
	GMAC_TYPE_OHLC_V3	OHLC message
	GMAC_TYPE_ORDER_DECREASE_V3	Order decrease message
	GMAC_TYPE_ORDER_DEPTH_V3	Order depth message
	GMAC_TYPE_ORDER_EXECUTED_V3	Order executed message
	GMAC_TYPE_ORDER_RESET_V3	Order reset message
	GMAC_TYPE_ORDER_UPDATE_V3	Order update message
	GMAC_TYPE_QUOTE_REQUEST_V3	Quote request message
	GMAC_TYPE_REFERENCE_SECURITY_V3	Reference security message
	GMAC_TYPE_BUNDLE_MARKER_V3	Bundle marker message
	GMAC_TYPE_SNAPSHOT_UPDATE_V3	Snapshot update message
	GMAC_TYPE_TOTAL_VOLUME_V3	Total volume message

GMAC_TYPE_TRADE_V3	Trade message
GMAC_TYPE_TRADING_STATUS_V3	Trading status message
GMAC_TYPE_UNCROSSING_V3	Uncrossing message
GMAC_TYPE_DUMMY_V3	Dummy message
GMAC_TYPE_TIME_REFERENCE_V3	Time reference message
GMAC_TYPE_SHO_SHORT_PRICE_RESTR_V3	SHO short sale price restriction message
GMAC_TYPE_RETAIL_PRICE_IMPROVEMENT_V3	Retail price improvement message
GMAC_TYPE_EXTENSION_CME2_V3	CME2 extension message
GMAC_TYPE_EXTENSION_ICE_V3	ICE extension message
GMAC_TYPE_EXTENSION_BATS_V3	BATS extension message
GMAC_TYPE_EXTENSION_EUREX_V3	EUREX extension message
GMAC_TYPE_EXTENSION_XETRA_V3	XETRA extension message
GMAC_TYPE_EXTENSION_HOTSPOTFX_V3	Hotspot FX extension message
GMAC_TYPE_EXTENSION_LIFFE_V3	Liffe extension message
GMAC_C_TYPE_SESSION_V3	Consolidated session message
GMAC_C_TYPE_TOB_V3	Consolidated top of the book update message
GMAC_C_TYPE_TRADING_STATUS_V3	Consolidated trading status message
GMAC_C_TYPE_TRADE_V3	Consolidated trade message
GMAC_C_TYPE_OHLC_V3	Consolidated OHLC message
GMAC_C_TYPE_TARDE_CORRECTION_V3	Consolidated trade correction message
GMAC_C_TYPE_TRADE_CANCELLATION_V3	Consolidated trade cancellation message
GMAC_C_TYPE_INDEX_V3	Consolidated underlying value message
GMAC_C_TYPE_SHO_SHORT_PRICE_RESTR_V3	Consolidated SHO short sale price restriction message
GMAC_C_TYPE_LULD_PRICE_BAND_V3	
GMAC_C_TYPE_MWCB_LEVEL_V3	

	GMAC_C_TYPE_MWCB_STATUS_V3	
CME2ExtensionType	**CME2SecDefRepeatGroupFeedType**	CME feed type extension message
	CME2SecDefRepeatGroupInstrAttrib	CME instrument attributes extension message
	CME2SecDefRepeatLegInformation	CME security definition leg information extension message
	CME2SecDefmain	CME security definition extension message
	CME2PacketHeader	CME packet header extension message
ICEExtensionType	**ICEMessageB**	ICE message B extension message
	ICEMessagep	ICE message p extension message
	ICEMessageW	ICE message W extension message
	ICEExtraInfo	ICE extra information extension message
	ICEMessageV	ICE message V extension message
BATSExtensionType	**BATSAddOrder**	BATS add order extension message
	BATSModifyOrder	BATS modify order extension message
EurexExtensionType	**EurexPacketHeader**	Eurex packet header extension message
	EurexProdRef	Eurex product reference extension message
	EurexOrderDepth	Eurex order depth extension message
	EurexTrade	Eurex trade extension message
	XetraPacketHeader	XETRA packet header extension message
	XetraInstrRef	XETRA instrument reference data extension message
	XetraMaintRef	XETRA maintenance reference data extension message
	XetraTradeOHLC	XETRA trade and OHLC extension message
	EurexEMDIPacketHeader	Eurex EMDI packet header extension message
	EurexEMDIFeedRef	Eurex EMDI feed reference extension message
XDPExtensionType	**LiffeRef**	Liffe refresh extension message
	LiffeMS	Liffe market modes extension message

	LiffeThrottleSize	Liffe throttle size extension message
HotspotFXExtensionType	**HotspotFXOrderInfo**	Hotspot FX order information extension message
ISEMDIExtensionType	**ISEMDIProductInfo**	ISE MDI product information extension message
EurexXetraStreamType	**STREAM_SNAPSHOT**	Snapshot stream
	STREAM_DELTA	Delta stream
	STREAM_ATP	ATP All Trade Price stream
	STREAM_MAINT	Maintenance stream
	STREAM_HIGH_INCREMENTAL	High incremental
	STREAM_HIGH_SNAPSHOT	High snapshot
	STREAM_LOW	Low
ActionType	**ACTION_NEW**	Add last trade price
	ACTION_UPDATE	Update last trade price
	ACTION_REVERSE	Delete last trade price
GMACCMWCBStatusV3	**GMACC_MWCB_LEVEL_ONE_BREACHED**	Level 1 breached
	GMACC_MWCB_LEVEL_TWO_BREACHED	Level 2 breached
	GMACC_MWCB_LEVEL_THREE_BREACHED	Level 3 breached
GMACCRetailInterestV3	**GMACC_RETAIL_NOT_APPLICABLE**	Retail interest not applicable
	GMACC_RETAIL_BID	Retail interest on bid quote
	GMACC_RETAIL_ASK	Retail interest on ask quote
	GMACC_RETAIL_BID_AND_ASK	Retail interest on both bid and ask quotes
GMACCLULDIndicatorV3	**GMACC_LULD_NOT_APPLICABLE**	LULD not applicable
	GMACC_LULD_BID_ABOVE_LIMIT	Bid price above upper limit price band
	GMACC_LULD_ASK_BELOW_LIMIT	Ask price below lower limit price band
	GMACC_LULD_BID_AND_ASK_OUTSIDE_PRICE_BAND	Band and ask outside price band
GMACCLULDNationalIndicatorV3	**GMACC_LULD_NATIONAL_NOT_APPLICABLE**	Limit Up - Limit Down Not Applicable

	GMACC_LULD_NATIONAL_BID_AND_ASK_EXECUTABLE	National Best Bid and National Best Ask are Executable
	GMACC_LULD_NATIONAL_BID_BELOW_LOWER_LIMIT	National Best Bid below Lower Limit Price Band
	GMACC_LULD_NATIONAL_ASK_ABOVE_UPPER_LIMIT	National Best Ask above Upper Limit Price Band
	GMACC_LULD_NATIONAL_BID_BELOW_LOWER_ASK_ABOVE_UPPER	National Best Bid below Lower Limit Price Band and National Best ask above Upper Limit Price Band
	GMACC_LULD_NATIONAL_BID_EQUALS_UPPER	National Best Bid equals Upper Limit Price Band
	GMACC_LULD_NATIONAL_ASK_EQUALS_LOWER	National Best Offer equals Lower Limit Price Band
	GMACC_LULD_NATIONAL_BID_EQUALS_UPPER_ASK_ABOVE_UPPER	National Best Bid equals Upper Limit Price Band – National Best Bid is in Limit State and National Best Ask above Upper Limit Price Band
	GMACC_LULD_NATIONAL_ASK_EQUALS_LOWER_BID_BELOW_LOWER	National Best Ask equals Lower Limit Price Band – National Best Ask is in Limit State and National Best Bid below Lower Limit Price Band
	GMACC_LULD_NATIONAL_BID_EQUALS_UPPER_ASK_EQUALS_LOWER	National Best Bid equals Upper Limit Price Band – National Best Bid is in Limit State and National Best Ask equals Lower Limit Price Band
GMACCLULDPriceBandV3	**GMACC_LULD_PRICE_BAND_NOT_PROVIDED**	None
	GMACC_LULD_PRICE_BAND_OPENING	Opening update
	GMACC_LULD_PRICE_BAND_INTRADAY	Intra-day update
	GMACC_LULD_PRICE_BAND_RESTATED_VALUE	Restated value
	GMACC_LULD_PRICE_BAND_SUSPENDED	Suspended during trading halt or trading pause
	GMACC_LULD_PRICE_BAND_REOPEN	Re-opening update
	GMACC_LULD_PRICE_BAND_OUTSIDE_HOURS	Outside price band rule hours
GMACCLULDFinraIndicatorV3	**GMACC_LULD_FINRA_NOT_APPLICABLE**	Limit Up - Limit Down Not Applicable
	GMACC_LULD_FINRA_BID_AND_ASK_EXECUTABLE	FINRA Best Bid and FINRA Best Offer are Executable
	GMACC_LULD_FINRA_BID_BELOW_LOWER_LIMIT	FINRA Best Bid below Lower Limit Price Band – FINRA Best Bid is Non-Executable
	GMACC_LULD_FINRA_ASK_ABOVE_UPPER_LIMIT	FINRA Best Offer above Upper Limit Price Band – FINRA Best Offer is Non-Executable
	GMACC_LULD_FINRA_BID_BELOW_LOWER_ASK_ABOVE_UPPER	FINRA Best Bid below Lower Limit Price Band and FINRA Best Offer above Upper Limit Price Band – FINRA Best Bid and FINRA Best Offer are Non-Executable