

## Description

Futures and options exchanges; market makers; hedge funds; and traders require real-time knowledge of the best bid and ask prices for the instruments that they trade. Algo-Logic's CME Tick product is an FPGA based hardware accelerator with CME MDP 3.0 feed handler and CME MarketByPrice (MBP) Futures & Options Order Book implemented in logic.

Algo-Logic's CME Tick achieves deterministic, ultra-low latency without jitter regardless of the number of tracked instruments at data rates of up to 10Gbps.

Algo-Logic's CME Tick supports:

1. Book building for instruments that have actual orders
2. CME multiple depth (i.e. real) book up to 5 levels deep
3. Book building for instruments that have implied orders
  - a. CNE implied book up to 2 levels deep
  - b. CME consolidated book up to 5 levels deep
4. Processing of CME MDP 3.0 messages
  - a. Market Data Incremental Refresh (35=X) MDP 3.0 message type, used for:

- b. Updating real and implied books in normal operation throughout the trading day
  - c. Start-of-day book initialization
  - d. Late joiner book initialization
  - e. CME Natural Refresh recovery mechanism
5. Reporting L2 snapshots with the best bid/ask information up to 5 levels deep
    - a. L2 snapshots are generated when each repeating group within a market data update is processed
    - b. L2 snapshots contain corresponding Security ID field, along with sided Price and Size fields
    - c. Real book snapshot is generated for instruments that have no implied orders
    - d. Consolidated book snapshot is generated for instruments that have implied orders

## CME Tick

The CME Futures and Options Order Book integrates with the Algo-logic Feed Handler to provide additional functions:

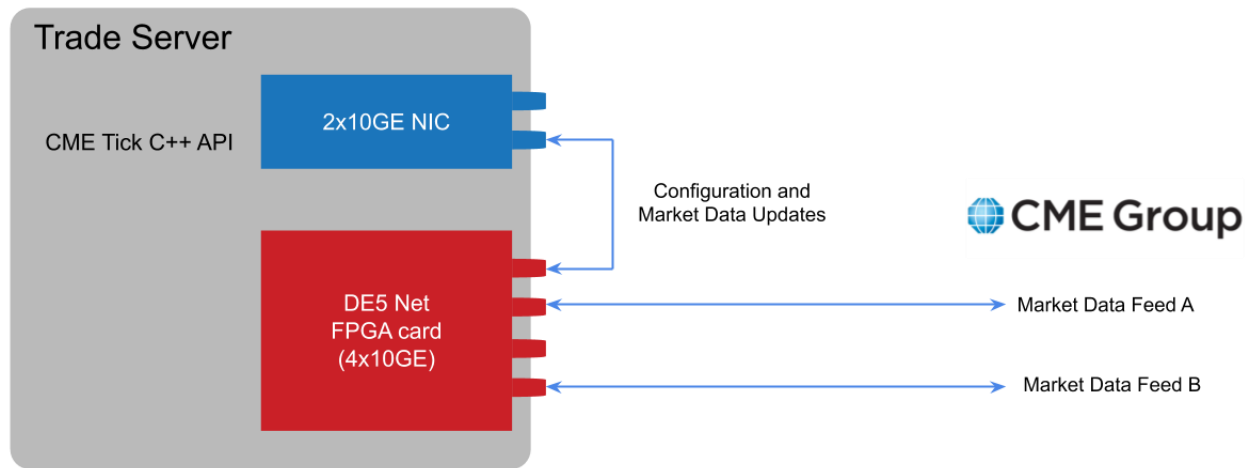
- A/B Feed Arbitration
- Multicast Channel Filter
- MDP 3.0 Message Processor

## CME Tick Specifications & Features

Number of Multicast Channels	Up to 16
Number of Instruments for 5 Levels	Up to 20
L2 Snapshot Generation	On processing of each repeating group with an incremental book update
Incremental Book Update Rate	39 million incremental order book update instructions per second
FPGA Platform Supported	Terasic DE5-Net

## CME Tick Deployment

### Direct Updates



### Distributed Updates

