

# **CME Direct**

# **Excel Quick Start Guide**

12 Dec 2017

Neither futures trading nor swaps trading are suitable for all investors, and each involves the risk of loss. Swaps trading should only be undertaken by investors who are Eligible Contract Participants (ECPs) within the meaning of Section 1a(18) of the Commodity Exchange Act. Futures and swaps each are leveraged investments and, because only a percentage of a contract's value is required to trade, it is possible to lose more than the amount of money deposited for either a futures or swaps position. Therefore, traders should only use funds that they can afford to lose without affecting their lifestyles and only a portion of those funds should be devoted to any one trade because traders cannot expect to profit on every trade. All examples discussed are hypothetical situations, used for explanation purposes only, and should not be considered investment advice or the results of actual market experience.

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# **Getting Started**

CME Direct offers side-by-side access to CME listed futures and OTC markets; all on one screen. Offering electronic trading of futures and swaps, aggregated OTC broker markets combined with straight-through processing and straight-through clearing via CME ClearPort, CME Direct helps you work more efficiently and effectively.

Note: For additional CME Direct information, refer to http://www.cmegroup.com/trading/cme-direct/.

The CME Direct Excel Add-In allows you to export data from the CME Direct Trading Client into Excel. This includes contract data, market data, fills data and trade data.

For market makers, it also allows you to manage and monitor orders.

For options traders/brokers, it allows you to feed in option analytics values ("Greeks"), which you may have sourced from, for example, your own internal calculation engine.

At the core of CME Direct's Excel feature is the CMED.C function. This finds a CME Direct code, or lookup key, used to uniquely identify a contract. This lookup key can then be used in conjunction with other functions, such as the CMED.MD market data function. To get your desired lookup key into Excel, you can either conduct a search using a **Functions Arguments** window, or find it in the Instrument Details window in the CME Direct Trading Client and type it directly into Excel. We recommend always using the CMED.C function, as this protects you against possible future changes to the format of this lookup key.

Note: Contract lookup is compatible with product codes (e.g. CL) or product names (e.g. WTI Future).

Excel integration also provides the ability to drag market data content from a CME Direct Exchange Trading Grid directly into Excel.

**Note:** For more information on these and other Excel features, functions, and VBA API, please contact <a href="mailto:CMEDirectSales@cmegroup.com">CMEDirectSales@cmegroup.com</a>.

#### Contact Information

For questions regarding this and other CME applications, please refer to the <u>Contact Information</u> directory on CME Group's Client Systems Wiki .

## What's New

The list below illustrates the updates made to the CME Direct Excel Help system.

Date	Topic	Description
12/12/17	All	New HTML5 Design
6/8/16	All	HTML5 conversion
12/1/15	CMED.MA, CMED.MD, Market Activity, Market Data	Misc updates
8/25/14	Added Function CMED.O, CMED.S, and CMED.G content	Misc updates
10/8/13	All	Initial version

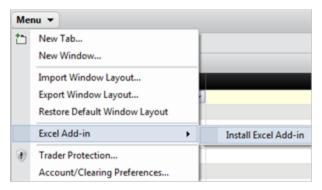
### Installing Excel Add-In

Once you have been provided Excel API Access, you must install the Excel Add-in from the Trader/Broker client.



### Using the CME Direct Trading Client to install the Excel Add-in:

1. From the toolbar, click Menu, point to Excel Add-in, and click Install Excel Add-in.



Note: Be sure that MS Excel is not open on your machine prior to selecting Install.

An install complete message appears.



2. Click OK.

Note: Follow steps 1-2 above to also uninstall the Excel Add-in.

3. Alternatively, you can use the **Excel** button on the toolbar to install the Excel Add-in. Click the **Excel** button, and when prompted to install, click **Yes**.



Note: The Excel button appears in the toolbar after Excel API Access is enabled in the CME Direct Admin tool.

When updates are available for the Excel Add-in, an upgrade option will be added automatically to the Menu.

**Note:** The Excel API will not appear in the <u>Add-ins list</u> until a pending upgrade is completed.

Upgrade Excel Add-in Uninstall Excel Add-in

### Locating the Add-In in Excel

Use Excel's **Options** to ensure the Excel Add-in installed properly.

Note: The Excel Add-ins list tells Excel where to find the CME Direct Add-in.

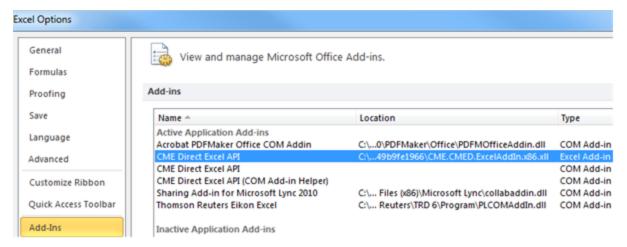


#### To use Excel to locate the Add-in:

1. From the Excel toolbar, under the File tab, click Options.

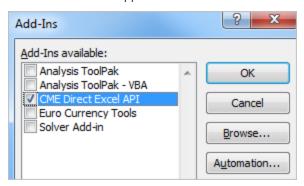
The Excel Options window appears.

2. Click Add-Ins.



3. From the Add-ins list, highlight CME Direct Excel API, and click Go.

An Add-Ins window appears.



4. Ensure CME Direct Excel API is selected, and click OK.

# **Inserting Functions**

Use the Excel fx (function) field to insert functions that retrieve data from the CME Direct Trading Client. This includes contract data, market data, fills data and trade data.

Note: You can also look up contract code via the Instrument Detail view.

CME Direct functions include the following:

- CMED.C Finds the CME Direct code for a contract
- CMED.CD Displays contract details for a specified contract
- CMED.F Constructs a table of fills
- CMED.MD Displays real-time market data from CME Direct
- CMED.GD Displays real-time Greeks data
- CMED.S Displays real-time status information about the CMED add-in
- CMED.T Constructs a table of trades
- CMED.P Locates CME Direct product codes
- CMED.PD Returns product details
- CMED.MA Returns market activity

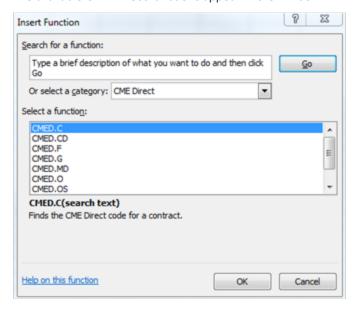
#### To insert a function:

1. From the Excel toolbar, click the fx button.

The Insert Function window appears.

2. From the Or select a category drop-down, select CME Direct.

The available CME Direct functions appear in the window.



3. Select a function and click OK.

A Function Arguments window appears (see CMED.C function and CMED.MD function).

#### Instrument Details

Use the Instrument Details view to locate a CMED Contract Code for use in Excel.



#### To find the correct code for a contract:

- 1. In the Trading Grid, click on a Product cell.
- 2. From the main toolbar, click Menu, and select Add View.
- 3. Click Instrument Details.

The Instrument Details view displays the code for the product you selected



#### CMED.C

Use the CMED.C user-defined lookup function to find the CME Direct code for a contract.

Tip: This code can be used in other Excel functions (e.g. market data).

Contract lookup can be performed in one of two ways:

• Using the CMED.C **Function Arguments** window, enter a product code and a contract period code (lookup input), and Excel returns a single matching CME Direct (CME Globex) code. For example, the lookup input for an outright strategy may be CLDec14 and the lookup input for an instrument spread may be CL/BZJan14.

Note: You can enter a code using either the product code (e.g. CL) or the product name (WTI Future).

• Typing the string of code (key) directly into Excel as a parameter.



Note: If no matching CME Globex code is found, an error message appears (e.g. #VALUE).

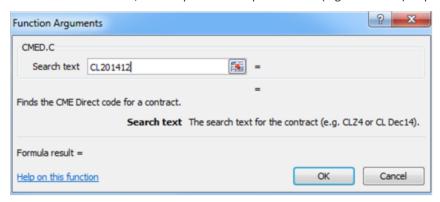


#### To look up a contract code using the CMED.C function:

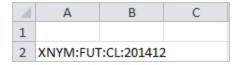
1. From the Insert Function window (illustrated above), select CMED.C and click OK.

A Function Arguments window appears.

2. In the Search text field, enter a product and period code (e.g. CL201412) or product name, and click OK.



The CME Direct contract code appears in Excel, in the last cell you highlighted.



3. Click in the cell to display your search text in the fx field.

Only certain tradable items are applicable when looking up contracts. They are as follows:

- Future Outrights
- Instrument Spreads
- Period Spreads
- FX Period Spreads

- Butterfly
- Condor

- Quarter Strip
- Year Strip

• Strip Spread

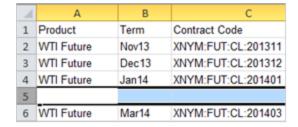
### Using the Concatenate Function

Use Excel's concatenate function in conjunction with the CMED.C function to combine cells and look up a contract using different Product and Term cells than those currently displayed.

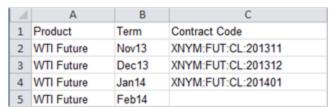


To use the CMED.C and concatenate functions together to look up a contract:

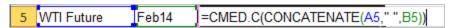
1. Add a row to your Excel grid.



2. Enter a new Product and Term in the appropriate cells.

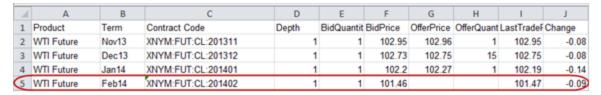


3. In an empty cell (e.g. C5), enter the following function using the applicable column and row designations: =CMED.C (CONCATENATE(A5, "",B5)).



4. Click Enter.

The **Contract Code** field populates and the grid displays any related orders.



#### CMED.CD

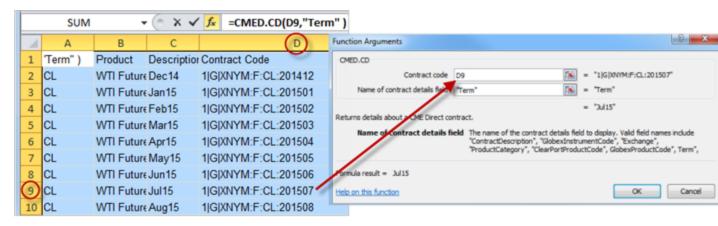
Use the CMED.CD function to look up contract details. The CMED.CD function allows for the return of any contract information accessible via the Instrument Details view. Using this function, Traders and Brokers can automatically retrieve static data in a spreadsheet and implement the logic of their choosing (e.g. retrieve and then sort order expirations).





#### To look up contract details:

- 1. Populate a spreadsheet using drag-and-drop or some other applicable CME Direct procedure.
- 2. From the Insert Function window, select CMED.CD and click OK.
  - A Function Arguments window appears.
- 3. In the Contract Code field, enter the column and row of the contract code for which you want details (e.g. D9).



Note: The Contract Code is also accessible from the CMED.C function.

4. In the Name of contract details field, enter the field name for which you want details (e.g. "Term").

The contract data displays directly in the **Functions Arguments** window.



The following fields are available for both futures and options contracts:

- ContractDescription
- GlobexInstrumentCode
- Exchange
- ProductCategory

Strategy

- ClearportProductCode ExpirationDate
- GlobexProductCode

ActivationDate

- Term
- TickSize

For options contracts, the following additional fields are available:

- UnderlyingFuture
- Strike

#### CMED.F

Use the CMED.F function to populate a table of fills in Excel. The table will be created in the cell below the one in which the function is entered, and will grow (optionally up to a specified maximum number of rows) as fills arrive.

Important: This function will overwrite existing data in the cells below where it is entered. It is recommended that you use this function on its own, blank, worksheet.



#### To generate fills:

- 1. Populate a range of cells with the columns you want in your table. Possible values include:
  - ContractCode
- Side

Slot

Price

Source

- Token
- OrderId

- OrderSide
- OrderContractCode

- OrderOwner
- OrderOwnership
- IsStrategy
- FilledQuantity

- TradeDate
- IsLeg

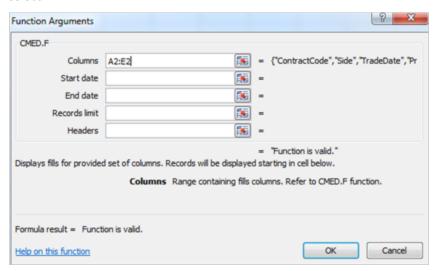
- Filled

- Account
- Notes

2. From the Insert Function window, select CMED.F and click OK.

A Function Arguments window appears.

Optional: In the Columns field, enter the range containing the column names, or click and drag in your spreadsheet to select.



- 4. **Optional:** Enter dates in the **Start date** and **End date** fields in your normal date format (e.g. 03/05/2015) this limits the date range for returned fills, allowing you also to perform a historical query.
- 5. Optional: Enter a maximum number of rows in the Records limit field.
- 6. Optional: Enter FALSE in the Headers field to suppress the display of column headers.

Note: Only the text "Function is valid" displays in the Function Arguments window.

7. To display fills, click **OK**.

2	ContractCode	Side	TradeDate	Price	FilledQuantity	_]
3	=CMED.F(A2:E2)					
4	ContractCode	Side	TradeDate	Price	FilledQuantity	
5	1 G XNYM:F:CL:201501	Sell	27/11/2014	\$ 78.00		1
6	1 G XNYM:F:CL:201503	Sell	27/11/2014	\$ 82.00		1
7	1 G XNYM:F:CL:201503	Sell	27/11/2014	\$ 82.00		1

#### CMED.MD

Use the CMED.MD function to subscribe to and display real-time market data from CME Direct. For Traders and Brokers, this function subscribes a single cell to a single market data statistic and can then be used to drive calculations and formulae in Excel.

The following market data attributes are available for subscription:

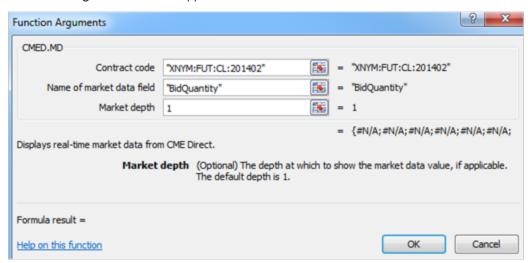
- BidQuantity
- BestBidQuantity
- LastTradePrice
- HighestBid
- LastTradeTime
- BidPrice
- BestBidPrice
- SettlementPrice
- LowestOffer
- NetChangePercentage
- OfferPrice
- BestOfferPrice
- HighestTradePrice
- OpenTradePrice
- TheoreticalSettlementPrice
- OfferQuantity
- BestOfferQuantity
- LowestTradePrice
- ClosePrice



#### To subscribe to market data:

1. From the Insert Function window, select CMED.MD and click OK.

A Function Arguments window appears.



- 2. Enter values for the following three market depth parameters, and click **OK**.
  - Contract Code The CME Direct code for the contract (e.g. 1|G|XNYM:FUT:CL201412).

Note: The Contract Code is the output from the CMED.C function.

- Name of market data field The name of the market data field to display (e.g. BidPrice, BidQuantity, LastTradePrice).
- Market depth (Optional) The depth at which to show the market data value (e.g. 1).

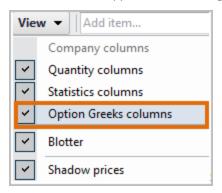
The Function is applied to the cell in which you last clicked, and displays in the fx field.



#### CMED.GD

Use the CMED.GD function to subscribe and display real-time Greeks data.

To ensure Greeks appear in the Strategies or Options (Calls/Puts) window, select View>Options Greeks column.



The following Greeks data attributes are available for subscription:

All
 Delta
 Gamma
 Theta

Rho

- Vega
- BidImpliedVolatility
- Theoretical
- Volatility
- OfferImpliedVolatility
  LowestTradePrice

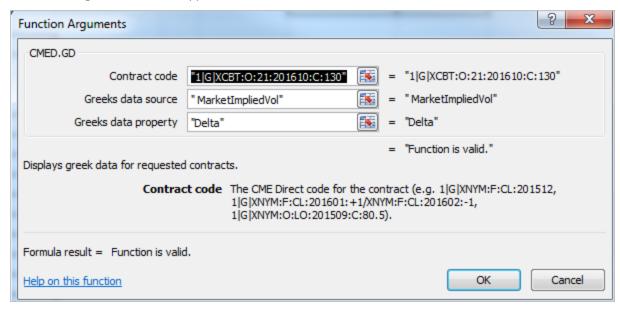


#### To subscribe to Greeks data:

ImpliedVolatility

1. From the Insert Function window, select CMED.GD and click OK.

A Function Arguments window appears.



- 2. Enter values for the following three market depth parameters, and click OK.
  - Contract Code The CME Direct code for the contract (e.g. 1|G|XCBT:O:21:201610:C:130).

Note: The Contract Code is the output from the CMED.C function.

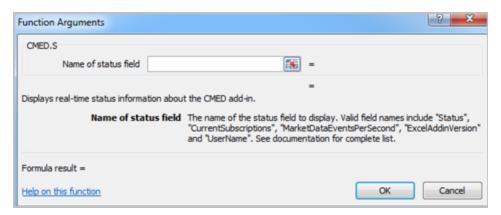
- Greeks data source The source of the Greeks data to subscribe for (e.g. MarketImpliedVolatility).
- Greeks data property The property of the Greeks data to display (e.g. Delta).

The Function is applied to the cell in which you last clicked, and displays in the fx field.

=CMED.GD(Contract Code, [Greeks Data Source], [Greeks Data Property])

Note: You can also retrieve Greeks using the VBA version of the API.

#### CMED.S



Use the CMED.S function to display real-time status information about the CMED add-in.

The CMED.S function displays values for the following status fields:

- Status
- NameLookupQueueLength
- ClientVersion
- SenderSubID
- MaximumSubscriptions
- CurrentSubscriptions
- SubscriptionQueueLength
- ExcelAddInVersion
- Apilnstances

- ContractLookupQueueLength
- MarketDataEventsPerSeconde
- UserName
- ActiveApiInstances

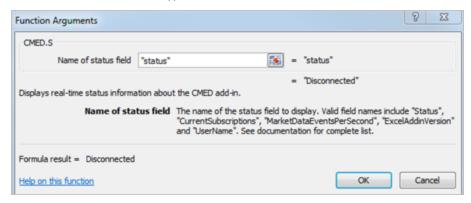
**Note:** This list includes the code for returning individual values. Use the {=CMED.S("ALL")} array (Ctrl-Shift-Enter or CSE) formula to return all values at once.



#### To use the CMED.S function:

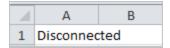
In the following example, you will use the CMED.S function to check your connection status.

- 1. Open Excel, and click to highlight a cell.
- 2. From the Insert Function window, open a CMED.S Function Argument window.
- 3. In the Name of status field, type "status".



4. Click OK.

The applicable status appears in Excel.



#### CMED.T

Use the CMED.T function to populate a table of OTC trades in Excel. The table will be created in the cell below the one in which the function is entered, and will grow (optionally up to a specified maximum number of rows) as fills arrive.

**Important:** This function will overwrite existing data in the cells below where it is entered. It is recommended that you use this function on its own, blank, worksheet.



#### To generate trades:

- 1. Populate a range of cells with the columns you want in your table. Possible values are:
  - ContactCode
  - Price
  - UpdatedDate
  - IsLeg
  - Buyer
  - IsBuyerAggressor
  - SellerAccount
  - DealNotes

- Dealld
- TradedQuantity
- ExecTime
- IsStrategy
- BuyerCompany
- BuyerNotes
- SellerClearer
- Status

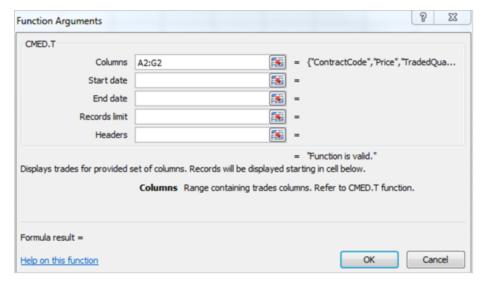
- TradeId
- TradeDate
- OrderTime
- IsStrip
- BuyerAccount
- Seller
- IsSellerAggressor
- StatusMsg

- ParentTradeId
- CreatedDate
- MatchTime
- Cancelled
- BuyerClearer
- SellerCompany
- SellerNotes

2. From the Insert Function window, select CMED.T and click OK.

A Function Arguments window appears.

3. Optional: In the Columns field, enter the range containing the column names, or click and drag in your spreadsheet to select.



- 4. **Optional:** Enter dates in the **Start date** and **End date** fields in your normal date format (e.g. 03/05/2015) this limits the date range for returned fills, allowing you also to perform a historical query.
- 5. Optional: Enter a maximum number of rows in the Records limit field.
- 6. Optional: Enter FALSE in the Headers field to suppress the display of column headers.

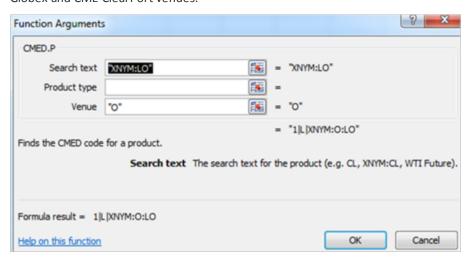
Note: Only the text "Function is valid" displays in the Function Arguments window.

7. To see fills, click **OK**.



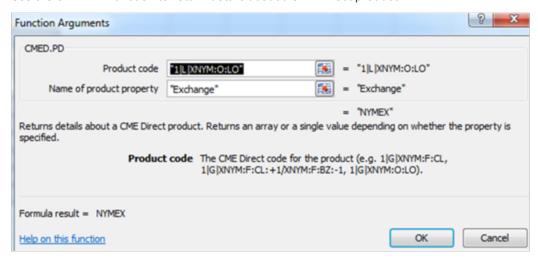
#### CMED.P

Use the CMED.P function to find the CME Direct code for a product. The CMED.P function finds products across both CME Globex and CME ClearPort venues.



#### CMED.PD

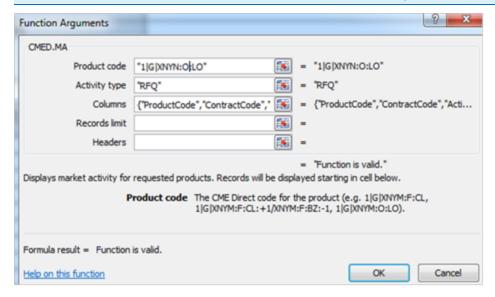
Use the CMED.PD function to return details about a CME Direct product.



#### CMED.MA

Use the CMED.MA function to retrieve Market Activity for a specific product in Excel. The table, created in the cell below the one in which the function is entered, grows (optionally up to a specified maximum number of rows) as Market Activity data arrives.

#### Note: The CMED.MA function does not retrieve historical Market Activity.



### **Error Types**

When entering a function, the following errors may appear:

- #N/A = A value is not available to the formula or function. Unknown.
- #Value A value used in the formula is of the wrong data type.

# **Dragging Data**

With the Excel Add-in installed and Excel enabled, you have the option of adding data to Excel using functions or dragging data from a Trading Grid into Excel. Dragging data automatically generates the correct formulae to subscribe to market data.

Note: This functionality applies to Exchange and Options Trading Grids.

You can drag a single Trading Grid cell or a group of cells.

Note: You cannot drag columns that are not supported by the CMED.MD function.

### Single Cell

For Traders and Brokers, this function eliminates the need to remember the syntax for the CMED.MD function.

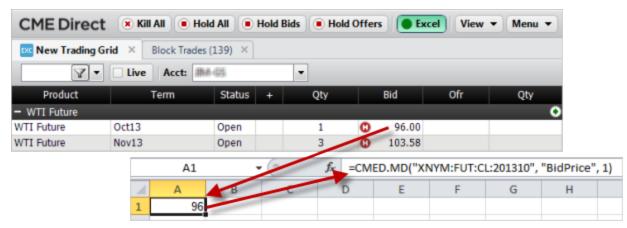
Note: If you select a cell that is not supported in the CMED.MD function, Excel will display an error.

The following rules apply to dragging a single cell.

- You can only drag formulas to Excel if you have the Excel API role.
- Supported columns are those for which the CMED.MD function can display the equivalent market data.
- Dragging (excluding group headers and column headers) from a supported column on a Trading Grid places a formula in Excel for the CMED.MD function with the corresponding contract code, depth, and market data field name.
- The Last Trade Time cell is formatted as a time when dragged into Excel.

#### To drag Trading Grid cell into Excel:

- 1. With Excel enabled, click and drag a cell from an Exchange Trading Grid into Excel.
- 2. The data from the Trading Grid appears in the Excel cell, and the order's function formula appears in the fx field.



### **Group of Cells**

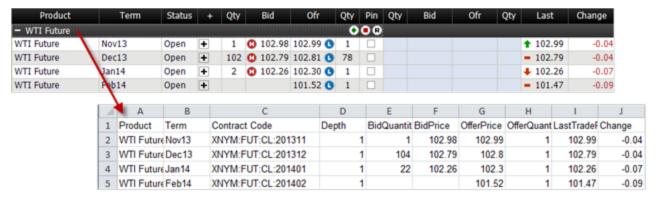
For Traders and Brokers, this function eliminates the need to enter multiple CMED.MD functions and reflects how you would manually set up the data. The following rules apply to dragging a group of cells:

- You can only drag formulas to Excel if you have the Excel API role.
- When dragging a group of columns, the column headings change to reflect the name of the market data field used by the CMED.MD function.
- Dragging a group adds a Contract Code column generated from the Product and Term using the CMED.C function.
- Dragging a group with expanded depth, displays the expanded depth rows in Excel.

- Dragging a group, inserts a Depth column.
- The Last Trade Time cell is formatted as a time when dragged into Excel.
- CMED.MD functions reference the generated contract code, the Depth column, and the relevant column headings.
- Cells not displaying depth in the trading client (i.e. everything other than bid/offer price/quantity) only contain formulas in Excel if they are in the top row of their tradable item section (i.e. at depth 1).

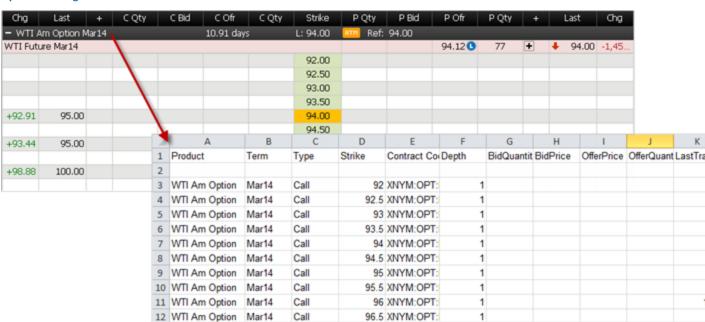
#### To drag a group of cells into Excel:

- 1. With Excel enabled, click a product header row and drag from an Exchange or Options Trading Grid into Excel.
- 2. The data from the Trading Grid appears in Excel and is formatted accordingly. Exchange Trading Grid



Note: If you change something in the Order Book, that change is reflected automatically in Excel.

#### **Options Trading Grid**



# Saving an Excel File

You can save your data as an .xls file using Excel's standard Save functionality.

After closing a saved file, the Excel indicator at the bottom of the Trading Grid changes from green to yellow, indicating you have no Active Connections, but Excel is still enabled. Re-open a saved file and the indicator changes back to green and your connection is re-established automatically.

Note: An orange Excel indicator appears when there are no Active Connections and Excel is disabled.

