

# Option Calculators User Manual

Option Calculators provide means for implied volatility calculation, option contracts pricing and calculation of option price sensitivities (greeks). Currently, through our website you can access there different Option Calculators:

Basic Equity Option Calculator - using end of day data by default.

Live Equity Option Calculator - using live option and underlying security quotes.

Basic Futures Option Calculator (part of Advanced Futures Options service) - using end of day data.

Each Option Calculator enables you:

- Forecast option's [theoretical value](#) and calculate sensitivities ([greeks](#)) based on the volatility you consider fair. In Live Calculator you can use 20-minutes delayed volatility here (see below)
- Calculate [implied volatility](#) of exchange-traded options using 20-minutes delayed bid/ask quotes (Live version) or end of day data
- Perform these calculations for any [not listed option](#) with custom parameters based on your input data

Follow the links above to see examples of each scenario or read general field-by-field description of the service first.

## General Description

The calculator screen consists of three parts: Input data (left of the screen), Output Price and greeks data (right) and Volatility Calculation (bottom right). Once you enter underlying or option symbol in the symbol box at the top and press 'Go' button, input parameters will be populated with default values.

Symbol:  Stock or Index Symbol

**IBM: NYSE - INTL BUSINESS MACHINES CORP** data is 20 minutes delayed Today's date: 11/22/2006 [Calculators Help](#)

<p>Style: <input type="text" value="American"/></p> <p>Price * : <input type="text" value="93.1"/></p> <p>Strike: <input type="text" value="95"/></p> <p>Expiration Date: <input type="text" value="Dec06"/></p> <p>Days to Expiration: <input type="text" value="24"/></p> <p>Volatility %: <input type="text" value="13.01"/></p> <p>Interest Rate%: <input type="text" value="5.32"/></p> <p>Dividends Date (mm/dd/yy): <input type="text" value="11/08/2006"/></p> <p>Dividends Amount: <input type="text" value="0.3"/></p> <p>Dividends Frequency: <input type="text" value="Quarterly"/></p>	<input type="button" value="Calculate"/>	<b>Call</b>		<b>Put</b>	
		Symbol:	<input type="text" value="IBMLS"/>	<input type="text" value="IBMXS"/>	
		Option Value:	<input type="text" value="0.6200"/>	<input type="text" value="2.2552"/>	
		Bid / Ask:	<input type="text" value="0.55/0.65"/>	<input type="text" value="2.20/2.30"/>	
		Delta: ?	<input type="text" value="0.3146"/>	<input type="text" value="-0.7190"/>	
		Gamma: ?	<input type="text" value="0.1143"/>	<input type="text" value="0.1273"/>	
		Theta: ?	<input type="text" value="-0.0272"/>	<input type="text" value="-0.0154"/>	
		Alpha: ?	<input type="text" value="-4.2022"/>	<input type="text" value="-8.2802"/>	
		Vega: ?	<input type="text" value="0.0848"/>	<input type="text" value="0.0806"/>	
		Rho: ?	<input type="text" value="0.0189"/>	<input type="text" value="-0.0262"/>	
<b>Implied Volatility</b>					
Option Price Vola %					
	<input type="text" value="Call"/>	<input type="text" value=""/>	<input type="text" value="0.00"/>		
<input type="button" value="Calculate"/>					

## Input Data

Field	Description
Style	Option calculator uses two different pricing models, Cox-Ross-Rubinstein binomial tree for American style options and Black-Scholes pricing model for European style options (mostly Index options)
Price	Stock Last Price/Index Value (20-minutes delayed in Live version)
Strike	Option strike; nearest to at-the-money strike is set by default
Expiration Date	Option expiry; closest expiry set by default
Days to Expiration	Days remaining to expiry; you can change this to analyze a non-standard option or perform what-if analysis
Volatility %	Default implied volatility is yesterday's end-of-day implied volatility (average for Call and Put)
Interest Rate %	The interest rate used is derived from last night's treasury market and is interpolated to conform to option's expiration term. We take LIBOR for terms up to one year inclusive and ISDA (R) Swaps IR par mid rate for terms above one year.
Dividend Date	Ex-date of next announced or last paid regular dividend
Dividend Amount	Dividend amount
Dividend Frequency	Frequency of regular dividend payments
Dividend Yield	Calculated from stock dividend data

Dividend data can be inputted for equity only. For futures options, you'll be able to enter futures expiry of course.

## Output Price and greeks data

Field	Description
Symbol	Shows the option symbols corresponding to inputted expiry and strike
Option Value	The Option Value calculated by IVolatility calculation engine
Bid/Ask	20-minutes delayed market bid/ask quote for your reference, provided by IVolatility ticker plant - shown only in Live Calculator
Delta	Change in option price corresponding to \$1 change in the underlying price
Gamma	Change in Delta corresponding to \$1 change in the underlying price
Theta	Change in option price as one day passes
Alpha	Alpha is a ratio of Gamma over Theta
Vega	Change in option price corresponding to 1% (absolute) change in the volatility
Rho	Change in option price corresponding to 1% (absolute) change in the interest rate

Alpha and Rho greeks are calculated in equity calculators only. For futures options, we always calculate futures greeks (with regard to futures price), not spot greeks. If you are confused with greeks, you can read more about them here: <http://www.ivolatility.com/news.j?nid=84>

Below we list show some popular use cases for the Live Calculator service.

## Option theoretical value and greeks calculation using custom volatility value

To calculate option's theoretical value based on your assumption of implied volatility, do the following:

1. Type in the symbol box your equity and press 'Go'.
2. Choose expiration in the dropdown box.
3. Choose the strike.
4. Enter the value of implied volatility you consider fair in Volatility % box in the left side of the screen. If you wish to use 20-minutes delayed volatility here, [see below](#) (only for equity Live Calculator).
5. Press 'Calculate' button and see theoretical value for Call and Put in 'Option Value' boxes to the right; you'll also see live market bid/ask quotes in 'Bid/Ask' boxes. Greeks values will be calculated as well.

Symbol: IBM Stock or Index Symbol ALL Go!

IBM: NYSE - INTL BUSINESS MACHINES CORP data is 20 minutes delayed Today's date: 11/22/2006 Calculators Help

	Call	Put
Symbol:	WIBAT	WIBMT
Option Value:	5.7378	9.0046
Bid / Ask:	4.90/5.10	8.40/8.60
Delta:	0.4837	-0.6167
Gamma:	0.0238	0.0326
Theta:	-0.0135	-0.0015
Alpha:	-1.7656	-21.2533
Vega:	0.3946	0.3580
Rho:	0.4435	-0.3332

Price\* = Last Price

Implied Volatility

	Option Price	Vola %
Call		0.00

Calculate

## Intraday implied volatility calculation for an exchange-traded option

To calculate implied volatility of option using 20-minutes delayed bid and ask quotes (only in equity Live Calculator), do the following:

1. Type in the symbol box your equity and press 'Go'.
2. Choose expiration in the dropdown box.
3. Choose the strike.
4. Press 'Calculate' button in the middle of the screen.
5. Now you'll see 20-minutes delayed bid/ask values at the right side of the screen ('Calculate' button not only calculates theoretical value and greeks, but also retrieves live option quotes from the market).

Symbol:  Stock or Index Symbol

**IBM: NYSE - INTL BUSINESS MACHINES CORP** data is 20 minutes delayed Today's date: 11/22/2006 [Calculators Help](#)

Style: <input type="text" value="American"/>	<b>Call</b>	<b>Put</b>
Price * : <input type="text" value="93.1"/>	Symbol: <input type="text" value="IBMGT"/>	<input type="text" value="IBMST"/>
Strike: <input type="text" value="100"/>	Option Value: <input type="text" value="2.9287"/>	<input type="text" value="7.7519"/>
Expiration Date: <input type="text" value="Jul07"/>	<b>Bid / Ask:</b> <input type="text" value="2.85/2.95"/>	<input type="text" value="7.70/7.80"/>
Days to Expiration: <input type="text" value="241"/>	Delta: <input type="text" value="0.3879"/>	<input type="text" value="-0.7143"/>
Volatility %: <input type="text" value="15.25"/>	Gamma: <input type="text" value="0.0336"/>	<input type="text" value="0.0464"/>
Interest Rate%: <input type="text" value="5.3497"/>	Theta: <input type="text" value="-0.0140"/>	<input type="text" value="-0.0019"/>
Dividends Date (mm/dd/yy): <input type="text" value="11/08/2006"/>	Alpha: <input type="text" value="-2.4045"/>	<input type="text" value="-24.9046"/>
Dividends Amount: <input type="text" value="0.3"/>	Vega: <input type="text" value="0.2882"/>	<input type="text" value="0.2401"/>
Dividends Frequency: <input type="text" value="Quarterly"/>	Rho: <input type="text" value="0.2183"/>	<input type="text" value="-0.1901"/>

**Price\* = Last Price**

**Implied Volatility**

Option Price  Vola %

6. Take 'live'  $(bid+ask)/2$  of call or put, depending which one you need and place in the 'Option price' box at the bottom right.
7. Choose call/put type of option in corresponding dropdown menu.
8. Press 'Calculate' button below at the bottom right and see 20-minutes delayed implied volatility value in 'Vola %' box.

Symbol:  Stock or Index Symbol

**IBM: NYSE - INTL BUSINESS MACHINES CORP** data is 20 minutes delayed Today's date: 11/22/2006 [Calculators Help](#)

Style: <input type="text" value="American"/>	<b>Call</b>	<b>Put</b>
Price * : <input type="text" value="93.1"/>	Symbol: <input type="text" value="IBMGT"/>	<input type="text" value="IBMST"/>
Strike: <input type="text" value="100"/>	Option Value: <input type="text" value="2.9287"/>	<input type="text" value="7.7519"/>
Expiration Date: <input type="text" value="Jul07"/>	<b>Bid / Ask:</b> <input type="text" value="2.95/3.10"/>	<input type="text" value="7.50/7.60"/>
Days to Expiration: <input type="text" value="241"/>	Delta: <input type="text" value="0.3879"/>	<input type="text" value="-0.7143"/>
Volatility %: <input type="text" value="15.25"/>	Gamma: <input type="text" value="0.0336"/>	<input type="text" value="0.0464"/>
Interest Rate%: <input type="text" value="5.3497"/>	Theta: <input type="text" value="-0.0140"/>	<input type="text" value="-0.0019"/>
Dividends Date (mm/dd/yy): <input type="text" value="11/08/2006"/>	Alpha: <input type="text" value="-2.4045"/>	<input type="text" value="-24.9046"/>
Dividends Amount: <input type="text" value="0.3"/>	Vega: <input type="text" value="0.2882"/>	<input type="text" value="0.2401"/>
Dividends Frequency: <input type="text" value="Quarterly"/>	Rho: <input type="text" value="0.2183"/>	<input type="text" value="-0.1901"/>

**Price\* = Last Price**

**Implied Volatility**

Option Price  Vola %

### Calculations using non-standard parameters

You can perform implied volatility or theoretical price and greeks calculation for any non-standard option traded on the OTC market. All the input fields are customizable, so just enter all the required data as per contract specification and perform calculations exactly as described above. One hint - to select non-standard expiry, enter corresponding value into 'Days to Expiration' box ('Expiration Date' box will always show 'FLEX' for non-standard expiry).