cryptoTrade

User Manual

Version 1.2.x

Introduction

cryptoTrade is a trading system that does automatic arbitrage between crypto currency exchanges.

Crypto markets are still a new and inefficient market. Several exchanges exist around the world and the buy/sell prices they propose can be briefly different from one exchange to another. The purpose of this application is to automatically profit from these temporary price differences.

The profit is reflected with an increase in the base currency trade. It means that the profit in a *Crypto trade* where BTC is the base currency will result in an increase of your final BTC balance. Similarly, the profit in a *Fiat trade* where US$ is the base currency will result in an increase of your final US$ balance.

Both type of trades are controlled and monitored from *Trade panel*.

Details of each successful trade will be recorded and shown in *Report panel*.

Any relevant information regarding the operation will be logged to *Information panel*.

cryptoTrade only trades within each exchange and no transfers between markets are part of the automated operation. The buy/sell and sell/buy trading activities are done in parallel on two different exchanges, independently.

Markets included in the arbitrage:

- GDAX
- BITSTAMP
- CEX
- BITTREX
- KRAKEN
- LIVECOIN

Crypto currencies (assets) included in the arbitrage:

- Bitcoin (BTC)
- Ethereum (ETH)
- Litecoin (LTC)
- Bitcoin Cash (BCH)
- Ripple (XRP)

Get started

The first step is obtaining credentials from the different markets and input them in *Settings*. In order to protect your accounts, it is recommended to generate your API keys with only the minimum privileges for cryptoTrade to do the work. Whereas the normal trading operation do not require withdrawal privileges, the *Transfer* tool in this application will need this capability to work.

Each market is different and the following information will assist to set up your credentials.

GDAX
View, Transfer, Bypass 2FA, Trade

BITSTAMP
Account balance, Open orders, Buy limit order, Sell limit order, Bitcoin withdrawal, Bitcoin deposit address, XRP Withdrawal, Litecoin withdrawal, ETH withdrawal, BCH withdrawal

CEX
Account balance, Open orders, Place order, Cancel order

BITTREX
Read, Trade, Withdraw

KRAKEN
Query Funds, Deposit Funds, Withdraw Funds, Query Open Orders & Trades, Query Closed Orders & Trades, Modify Orders, Cancel/Close Orders

LIVECOIN
N/A

The next step is to set up the parameters to trigger and limit your trades. Only when the difference between two markets reaches your threshold for an expected profit, a trade will be triggered. These values are configured in *Settings.*

The percentage for *Fiat trade* and *Crypto trade* are configured independently, because the expected profit in each type of trade is usually different.

As a matter of precaution, you can also set a limit amount of US$ or Bitcoins when trading with Fiat and Crypto respectively. These limits can be configured also in *Settings*.

Not all markets need to be set for cryptoTrade to work, but a minimum number of two is required to make the arbitrage.

How is arbitrage accomplished?

Let's assume you have US$500 in CEX and BTC0.05 in LIVECOIN. In addition, you have set your threshold for *Fiat trade* as 3% profit.

Assuming all credentials to access your markets are set, cryptoTrade will query each currency by requesting the proposed price (based on last trade) for each market. The higher price will be used to sell and the lowest price to buy. This is the monitoring stage which will continue uninterrupted until your threshold profit is matched.

cryptoTrade visualises this stage using gray border markers for each row as it monitors and moves across all currencies.

The evaluation of the expected profit deducts the exchange fees for both markets and the percentage is calculated based on the *buy* price. If for example the price for BTC-USD pair in CEX is $8,000 and the price in LIVECOIN is $8,300 and for simplicity let's assume no fees are applied in these markets, then the expected profit will be %3.75.

This result will trigger the next step of the operation which involves evaluating the maximum quantity of crypto currency (BTC in this example) that can be traded before placing the orders:

CEX: price=US$8,000 / Max BTC we can buy: 0.0675
LIVECOIN: price=US$8,300 / Max BTC we can sell: 0.05

Based on the above, the trade quantity will be 0.05 BTCs and the limit orders will be placed as below:

CEX: Limit buy order => US$8,000 / 0.05 BTCs
LIVECOIN: Limit sell order => US$8,300 / 0.05 BTCs

When cryptoTrade reaches this stage, the selected markets will be highlighted with green border for the buying market (CEX in this example) and red border for the selling market (LIVECOIN in this example). Also in this stage, your transaction will be recorded in the database and shown in the report with the following information:

Asset: BTC
Quantity: 0.05
Amount: US$400 ($8,000x0.05)
Market buy: CEX US$8,000
Market sell: LIVECOIN US$8,300
Profit: $15 / %3.75

cryptoTrade will now wait for these orders to be filled and once this happens, the colored

border will be fully shaded with the relevant colors. When both orders are filled, cryptoTrade will re-start monitoring the markets.

In case you don't want to wait for the orders to be filled, it is possible to skip this step and cryptoTrade will resume monitoring the markets. Skipping the completion of orders is always possible, but take in consideration that you will have less liquidity in your portfolio until these orders are filled. This option can be adjusted at to different levels: Switching the *Skip* control <u>ON</u> to activate it permanently during a live trade or manually clicking the *Skip* button each time. The former would be suited for unsupervised operation (e.i during the night), whereas the latter would give you more control.

The explanation above will also apply for *Crypto trade* with the only difference that the base currency in this case will be Bitcoin.

The following limits are taken in consideration before trading:

- During *Fiat trade* the minimum amount in US$ is 100. A market with less than US$100 won't be included in the evaluation to place limit <u>buy</u> orders.

- During *Crypto trade* the minimum amount in BTC is 0.005. A market with less than BTC0.005 won't be included in the evaluation to place limit <u>buy</u> orders.

Trading panel

This is the main panel to control and monitor your trades.

Switch between *Fiat trade* and *Crypto trade*.

Switch between *Test mode* and *Live mode*. When running as *Test mode*, cryptoTrade will log the successful 'possible' trades in the *Information panel*. You don't need to have funds for test mode. On the other hand, *Live mode* will execute trades when the criteria is met.

Switch between the alternative to wait for your orders to be filled (*Skip=OFF*) or do not wait and resume looking for another trade (*Skip=ON*).

You can enable or disable markets included in the arbitrage by clicking the button in the market title. It will show when you hover the mouse.

You can enable or disable crypto currencies included in the arbitrage by clicking the button in the currency title. It will show when you hover the mouse.

The last column *DIFF* is used to monitor the differences occurred in each currency after any transaction (trades, transfers, etc.). You can reset this difference and save the current quantities calculated in *TOTALS* by clicking the button in the title. It will show when you hover the mouse.

When cryptoTrade is running, markers will assist to identify different stages:

Monitoring - Gray border
Limit Buy placed - Green border
Limit Sell placed - Red border
Limit Buy filled - Green solid
Limit Sell filled - Red solid

The expected percentage and participating markets in the assessment are indicated at the top left corner. The first market is the one reporting the lowest price which will be a candidate to BUY an asset and the second market is the one reporting the highest price, which will be a candidate to SELL the same asset.

The example above shows that buying the asset in KRAKEN and selling it in CEX will produce a profit of 0.14%.

The top right of this panel shows the parameters that have been selected in *Settings* for the arbitrage. T (Threshold) and M (Maximum/Cap amount to trade).

Live trade / Test market starts the arbitrage in with the selected mode.

Clear button is used to clear all markers if needed.

Finish button is enabled only when the application is running and it will stop the operation when it is safe to do so. This request can take up to 1 minute to action.

Balances button is used to update your funds for all markets. It is useful when you have made changes in the markets.

Portfolio button will evaluate your portfolio based on the quantities shown in *TOTALS*. The amount is calculated in different currencies using the current price provided by BITSTAMP. For convenience, an additional currency to evaluate your portfolio can be chosen from the selection box.

Report panel

All successful trades are recorded in the database and shown in this panel as part of the report. The structure is the same for *Fiat trades* and *Crypto trades*.

The data presented in each record is described below from left to right:

| 14.04.2018 05:12am | LTC | 1.47936355 US$193.69 | KRAKEN US$130.93 LIVECOIN US$135.99 | US$6.60 3.41% |

Date and time when the limit buy/sell orders where placed

Asset used in the transaction: LTC

Quantity of LTC that was traded: 1.47936355

Transaction amount: US$193.69

Market used to buy the asset and price: KRAKEN US$130.93

Market used to sell the asset and price: LIVECOIN US$135.99

Profit in the base currency and percentage: US$6.60 / 3.41%

At the bottom of the panel you will find the total amount profited when adding all your transactions.

This report will also inform the status of your orders. When an order is placed, but not yet filled, the market name will show bold. Otherwise, when the order is completed, it will show normal. This is checked automatically when you open *Fiat trade* or *Crypto trade* and during arbitrage, alternately you can use the *Update* button.

Update button will check the status of your orders and update the report accordingly.

Export button can be used to export your records into a txt tab separated file.

Delete record: Slide the record to the left to show the rubbish bin icon.

Information panel

This panel is used during *Test mode* and *Live mode* to log the following type of information:

Errors: This message is logged when there is a problem communicating with a market. Possible reasons are: wrong credentials, temporary unresponsive servers, problems with your Internet connection, firewall restrictions, proxy server restrictions, anti-virus restrictions, etc.

`ERROR accessing server | XX_function – Description`

`XX_function`: Indicates the function in the work flow where the error was detected. The possible options are:

`XX_addressCrypto:`	When trying to obtain the deposit address for a wallet
`XX_availableFunds:`	When trying to get the available balance
`XX_pricePair:`	When trying to request the price for a crypto currency pair
`XX_limitOrder:`	When submitting the limit buy/sell order

`XX_orderCompleted`: When monitoring the completion of an order.

The `XX` portion indicates the market where the error occurred:

`BT:`	Bittrex
`BS:`	Bitstamp
`GDAX:`	GDAX
`CEX:`	CEX.IO
`KK:`	Kraken
`LC:`	LIVECOIN

Test: This message is logged during *Test mode* when the threshold is achieved. It will provide all information in relation to the successful test trade.

Missed trade: This message is logged during a *Live trade* when an order wasn't placed due to unavailable funds (or Silver version restrictions). All information regarding the missed trade will be provided in the message. This is helpful to identify markets and assets with good potential for arbitrage.

Clear button can be used at any time to clear the log panel.

Additional features

Settings: Access from *Configuration* menu. This dialog allows:

- Store credentials for all markets.
- Store deposit addresses for markets who can't provide them remotely.
- Set your threshold for *Fiat trade* and *Crypto trade*.
- Set limits (cap) for US$ and Bitcoin amounts to be traded.

Transfer tool: Access from *Tools* menu. This is used to transfer crypto currency between your markets. There are some restrictions due to unimplemented functions in some of the markets. However, this situation will be notified when you try to make a transfer.

GDAX doesn't provide deposit addresses, so this shortcoming is resolved by adding the addresses in *Settings*.

Password: Access from the *Configuration* menu. This dialog is used to change the password to access cryptoTrade.

Dropbox backup: Accessible from the startup window when you are logged out from your database.

As first step, you will need to authorise your application with Dropbox to enable the Upload/Download capabilities. Once this is done, you will be able to backup your

database in your Dropbox account.

Security: All credentials are encrypted before they are stored in the database. In addition, when you logout and you are back in the startup window, the database is also encrypted using your password.

The database and Dropbox tokens are stored in your machine. Nothing is stored or transmitted to another server.

Subscription: Accessible from the cryptoTrade menu. This dialog will help you purchase a subscription or if there is one active, it will show the expiration date.

Silver and Gold version

The package available in darhon.com can be downloaded freely and used under our license agreement published in the product's page. The Silver version is free of charge and it has restrictions explained in the version matrix. This version allows the user to go through the application, learn its functionality without time restriction and still get a useful tool for the basic needs. Therefore, in order to unlock all features, you will need to upgrade to Gold version.

Apart from the restricted features applied to the Silver version, both versions are identical. You do not have an expiration period with the Silver version. You do not need to re-install the software.

To upgrade to Gold version you need to purchase a subscription using the Subscription dialog from the menu.

Installation and configuration

Please refer to darhon.com for information regarding installation, configuration and troubleshooting in your preferred platform.

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