



BITMAIN  
CRYPTO INDEX  
METHODOLOGY

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## Table of Content

<b>Overview</b> .....	<b>2</b>
<b>Selection Criteria</b> .....	<b>3</b>
Eligible Exchanges.....	3
Eligible Cryptocurrencies .....	4
<b>Bitmain Single Crypto Real-Time Spot Prices (SCP)</b> .....	<b>4</b>
<b>Composite Cryptocurrency Real-Time Index (CCI)</b> .....	<b>5</b>
Bitmain Crypto Large Cap 10 Index (Large Cap 10).....	5
Monthly Rebalancing.....	5
Adjustment of Divisor .....	6
<b>Daily Reference Price (DRP)</b> .....	<b>7</b>
<b>Index Publication Schedule and Frequency</b> .....	<b>7</b>
<b>Hard Fork Policy</b> .....	<b>7</b>
<b>Contingency Treatment</b> .....	<b>8</b>
Data Interruption or Delay .....	8
Erroneous Data .....	8
<b>Exceptional Events</b> .....	<b>8</b>
<b>Risks and Limitations</b> .....	<b>9</b>
<b>Use and License</b> .....	<b>10</b>

## Overview

Bitmain Crypto Index (“**Index**”) is developed to provide institutional and retail investors with a transparent, timely, methodology-based, and investable benchmark of the most active cryptocurrencies traded globally, denominated in USD. The Index is solely owned by Bitmaintech Pte. Ltd. and is administered by Bitmain Index Operating Committee (“**BIOC**”)<sup>1</sup> which will conduct regular review and engagement with external stakeholders for feedbacks to keep the Index methodology as updated and representative as possible.

The Index publishes two types of Index prices: Real-Time Spot Price (“**RTP**”) that is published every second and 24/7/365 alongside with Daily Reference Price (“**DRP**”) that is published once a day around 10:00am Hong Kong Time (“**HKT**”). The following table summarizes the key parameters of the two types of Index prices:

	<b>Bitmain Crypto Real-Time Spot Price</b>	<b>Bitmain Crypto Daily Reference Price</b>
<b>Symbol</b>	RTP	DRP
<b>Denomination</b>	USD per cryptocurrency or per cryptocurrency basket	
<b>Calculation Methodology</b>	Real-time calculation of mid-price of the best bid/ask from Constituent Exchange <sup>2</sup> , weighted by the respective historical trading volumes of the Constituent Exchange	Arithmetic average of RTPs over a 10-minute window between 9:50:00 – 10:00:00am HKT
<b>Publication Frequency</b>	Once per second	Once per day at 10:00am HKT
<b>Index Day</b>	Every calendar day of a calendar year that the Index is published	

The Index is categorized into 3 categories based on its usage and nature, namely Currency<sup>3</sup>, Platform<sup>4</sup> and Privacy<sup>5</sup>. The following lists out the cryptocurrencies that we are currently covering:

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<sup>1</sup> BIOC is formed by Bitmaintech Pte. Ltd or affiliates' senior executives that have the good understanding and knowledge in trading and evolvement of crypto market.

<sup>2</sup> Constituent Exchange is an exchange whose trading data is used as a constituent for index calculation in a specific crypto index

<sup>3</sup> Currency tokens are native blockchain assets intended to be used as money or store-of-value

<sup>4</sup> Platform tokens are used as “gas” on general purpose decentralized networks which support a wide variety of applications

<sup>5</sup> Privacy tokens are decentralized currencies provide the user a higher level of anonymity and make it difficult or impossible for a third party to track the flow of coins from one transaction to the next.

	Name	Symbol	Category	Real-Time Price	Daily Reference Price
<a href="#"><u>Single Crypto Spot Price Index</u></a>					
1	Bitcoin	BTC	Currency	✓	✓
2	Ethereum	ETH	Platform	✓	✓
3	Bitcoin Cash	BCH	Currency	✓	✓
4	EOS	EOS	Platform	✓	✓
5	Ethereum Classic	ETC	Platform	✓	✓
6	Litecoin	LTC	Currency	✓	✓
7	Ripple	XRP	Currency	✓	✓
8	Tron	TRX	Platform	✓	✓
9	Dash	DASH	Currency	✓	✓
10	Zcash	ZEC	Privacy	✓	✓
11	Stellar Lumens	XLM	Currency	✓	✓
12	IOTA	IOTA	Platform	✓	✓
13	NEO	NEO	Platform	✓	✓
14	Monero	XMR	Privacy	✓	✓
15	Cardano	ADA	Platform	✓	✓
16	OmiseGO	OMG	Platform	✓	✓
17	ICON	ICX	Platform	✓	✓
<a href="#"><u>Composite Crypto Index</u></a>					
18	Bitmain Crypto Large Cap 10 Index	BLC10	Basket	✓	✓

## Selection Criteria

### Eligible Exchanges

Crypto Exchanges from which the input price data sources for the Index calculation are obtained shall be subject to the following selection criteria and the eligibility is reviewed on a monthly basis, as following:

1. The exchange has significant trading volume for at least three or more cryptocurrencies on the exchange
2. The exchange has no capital control on international investors in the country where the exchange is domiciled in
3. The exchange charges trading fees
4. The exchange operates in compliance with local laws and is not subject to significant regulatory investigation or under severe legal action
5. The exchange has appropriate Know-Your-Client and Anti-Money-Laundering policy and procedures in place and the process are properly documented

6. The exchange operates with good technical stability with no significant downtime and/or security issues
7. The exchange provides a functioning, secure and reliable API or HTTP/Restful API to obtain real-time trade data
8. An exchange must meet the above eligibility requirements for a minimum of two consecutive months to be included

### Eligible Cryptocurrencies

Cryptocurrency that is included as a Constituent Cryptocurrency<sup>6</sup> has to fulfill a set of eligibility requirements which are also subject to monthly review, as following:

1. The cryptocurrency is a cryptographically secured digital bearer instrument
2. The cryptocurrency trades in US dollar or US dollar equivalent (converted to USD with the real-time exchange rate), however there must be at least one standing USD trading pair as the constituent price source for a cryptocurrency to be included
3. The cryptocurrency is of free floating price that is not pegged to any other asset such as currency or commodity or another cryptocurrency, i.e. not a stable coin
4. The cryptocurrency trades on three and/or more eligible exchanges and has no more than 90% of its past trailing 30-day average trading volume on any single eligible exchange
5. The cryptocurrency must meet the above eligibility requirements for two consecutive monthly rebalances to be included in the Index or have its standalone Index
6. Hard Fork and its treatment is defined in the section [Hard Fork Policy](#)

### Bitmain Single Crypto Real-Time Spot Prices (SCP)

SCP is an intraday indicative spot price published every second that are designed to track the executable price for a selection of single cryptocurrency. The price sources for calculating SCP are collected from a number of eligible exchanges that fulfill the set of selection criteria such as price transparency, regulatory and compliance level, trading volume, frequency and quality of the price data, jurisdiction, and reputation of the exchange etc. (refer to section [Selection Criteria](#)).

$$SCP_t = \frac{\sum_{i=1}^x P_{i,t} \times V_{i,m}}{\sum_{i=1}^x V_{i,m}}$$

Remarks:

$P_{i,t}$  = the mid-price of the best bid and ask prices on the Constituent Exchange  $i$  for the current second

$V_{i,m}$  = the average daily volume of the past trailing 30 calendar days for the Constituent

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<sup>6</sup> Constituent Cryptocurrency is a cryptocurrency that forms the constituent of a basket of composite cryptocurrency index

Exchange  $i$

$x =$  number of Constituent Exchange

## Composite Cryptocurrency Real-Time Index (CCI)

The composite cryptocurrency Index tracks the overall price movement of a basket of cryptocurrencies.

### Bitmain Crypto Large Cap 10 Index (BLC 10)

The Bitmain Large Cap 10 tracks a basket of ten cryptocurrencies that represents the largest market capitalization among all cryptocurrencies, published every second and 24/7/365. All Constituents Cryptocurrencies are weighted by their free-float market capitalization that are calculated from the Available Supply<sup>7</sup> (source attributed to Coinmarketcap):

$$Index_t = \frac{\sum_{i=1}^n SCP_{i,t} \times AS_{i,m}}{D_m}$$

Remarks:

$Index_t$  = the Index level at time  $t$

$SCP_{i,t}$  = the price for the Index Constituent Cryptocurrency  $i$  at the time of  $t$

$AS_{i,m}$  = the Available Supply of the Index Constituent Cryptocurrency  $i$  for the month  $m$  of the current year

$D_m$  = the Divisor at month  $m$  of the current year

$n =$  number of Index Constituent Cryptocurrencies in month  $m$  of the current year

The base level for the Index was set at 1,000 on November 30, 2018, at the first Index Day. Initial Divisor  $D_0$  is calculated as:

$$D_0 = \frac{\sum_{i=1}^n SCP_{i,0} \times AS_{i,0}}{1000}$$

$D_0$  = the Divisor on November 30, 2018

$SCP_{i,0}$  = the price for the Index Constituent Cryptocurrency  $i$  on 00:00:00 of November 30, 2018

$AS_{i,0}$  = the Available Supply of the Index Constituent Cryptocurrency  $i$  on November 30, 2018

$n =$  number of Index Constituent Cryptocurrencies on November 30, 2018

### Monthly Rebalancing

The index Constituent Cryptocurrencies weightings are re-evaluated once a month at the end

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<sup>7</sup> Source : Coinmarketcap

of the month. The adjusted Constituents and its respective weightings will be published on [BTC.com index webpage](#) on or before 18:00:00 Hong Kong Time (HKT) on the last business day of the month (**Rebalance Announcement Day**) according to Hong Kong Public Holiday calendar, while the actual rebalancing will take effect on the first Index Day of the next month (**Rebalance Effective Day**).

To avoid frequent rebalancing of positions and the resultant price fluctuations for institutional investors who use this Index for asset management, there is a “cushion mechanism” in place when a new Constituent Cryptocurrency coming into the Basket or an incumbent Constituent Cryptocurrency dropping out from the Basket. Constituent Cryptocurrencies that meet the inclusion criterion for three consecutive months will be added to the Basket while those fall short of such criterion for three consecutive months will be removed from the Basket. However, with such exercise, the number of Constituent Cryptocurrencies in the Index will always be capped at 10. In the event that the number of the eligible cryptocurrencies exceeds this cap, only the top ten ranking cryptocurrencies will be included.

There will be no changes on the Constituents Cryptocurrencies and its respective weightings in the middle of the month.

#### Adjustment of Divisor

Index level should remain constant at events of changes in the Available Supply of Index Constituent Cryptocurrencies, or the inclusion and removal of Index Constituents Cryptocurrencies. As long as there is a factor that would impact the total market capitalization and/or Index Constituent Cryptocurrency weighting, an adjustment of Divisor will be needed. The following formula stands:

$$D_m = D_{m-1} \times \frac{\sum_{i=1}^n P_{i,t} \times AS_{i,m}}{\sum_{i=1}^x P_{i,t} \times AS_{i,m-1}}$$

Remarks:

$P_{i,t}$  = the price for the Index Constituent Cryptocurrency  $i$  at the time of  $t$

$AS_{i,m}$  = the Available Supply of the Index Constituent Cryptocurrency  $i$  for the month  $m$  of the current year

$AS_{i,m-1}$  = the Available Supply of the Index Constituent Cryptocurrency  $i$  for the previous month, i.e.  $m-1$  of the current year

$D_m$  = the Divisor in month  $m$  of the current year

$D_{m-1}$  = the Divisor in the previous month, i.e.  $m-1$  of the current year

$n$  = number of Index Constituent Cryptocurrency in month  $m$  of the current year

$x$  = number of Index Constituent Cryptocurrency in the previous month, i.e.  $m-1$  of the current year

## Daily Reference Price (DRP)

The official Daily Reference Prices of a single cryptocurrency or a composite cryptocurrency Index are published once a day at 10:00:00 HKT as an arithmetic average of the given SCPs or CCI over a 10-minute window between 9:50:00 – 10:00:00 am HKT.

## Index Publication Schedule and Frequency

The CSPs and CCI are published real-time on [BTC.com index webpage](#) on a second level 7-day a week, 24-hour a day, except for Exceptional Events.

The official DRPs are normally published on [BTC.com index webpage](#) normally around 10:00 am HKT.

All Index data published on BTC.com are signed in real-time with the digital signature of Bitmain upon index generation to provide time-stamped, irrevocable and verifiable assurance to institutional and retail users for making use of the indices products off or on blockchain.

## Hard Fork Policy

A hard fork is considered if two or more diverging blockchains exist post fork that share the same pre-fork blockchain, and nodes running previous versions will no longer be compatible with the new version.

For the purpose of Index calculation and dissemination, a hard forked new token will be measured against a set of criteria on its 10<sup>th</sup> day post-fork to determine whether it is a “significant” one:

- The new token must be trading on at least 2 constituent exchanges
- There must be at least 200 daily trades in the new token vs. USD or equivalent pairs on all constituent exchanges
- The aggregate trading volume of the new token vs. USD or equivalent pairs must be no less than 10% of the combined trading volume of the original token vs. USD or equivalent pair and the new token vs. USD or equivalent pair
- The trading price of the new token vs. USD or equivalent pairs should be no less than 10% of the trading price of the original token and the new token pair added together

Should a new token be deemed significant, the BIOC will start the calculation the dissemination of the Index after 15<sup>th</sup> day post-fork, otherwise the BIOC has the discretion not to publish the index on the new token pair.

## Contingency Treatment

### Data Interruption or Delay

If the retrieval time of the relevant price source at a Constituent Exchange is at least 5 minutes later than the time of calculation of the real time prices, then the Constituent Exchange is disregarded in the calculation, and the weighting of the affected Constituent Exchange will be automatically re-distributed proportionally into the remaining functional Constituent Exchanges until the affected Constituent Exchange resumes operation.

### Erroneous Data

All relevant price sources are subject to an auto-filtering process (check for abnormal data format and/or data movement) to screen out erroneous data. Erroneous data are disregarded in the calculation of the Real Time Spot Price, and the weighting of the affected Constituent Exchange will be automatically re-distributed proportionally into the remaining functional Constituent Exchanges until the affected price source is no longer regarded as erroneous. The flagged erroneous data is reported to BIOC for attention.

If at the time of calculation, data interruption or delay and erroneous data occur on every Constituents Exchange, then a data source failure is considered. The Real Time Spot Price Index for that calculation time is not published due to data source failure and its occurrence is reported to BIOC for attention.

## Exceptional Events

It is clearly acknowledged that the ability to connect to the internet is subject to limitations on stability of global network, residence of user, network in use, power supply, computer virus, hacking, and other uncertain factors. BIOC is not liable to any stop of service due to the abovementioned situations, and BIOC undertakes no obligation to inform user in advance. BIOC may, at its sole discretion, suspend the Index, especially in circumstance of force majeure events, including but not limited to typhoon, earthquake, tsunami, flood, power outage, terrorist attacks, computer viruses, Trojan horse, hacker attacks, system instability or government behaviors, material adverse change of applicable laws or policies and other reasons, which result in BIOC's inability to provide Index or if in BIOC's reasonable opinion, continuous provision of services would result in significant risks. If above-mentioned events occur, BIOC has the right to suspend the Index until further notice or resume until the situation recovers or terminate the publication completely. Bitmaintech Pte. Ltd. or any of its Affiliates shall not be held liable for any loss or damage caused by the suspension or termination of the Index.

For avoidance of doubt, "Affiliate" shall mean, with reference to any specified Person, any other Person controlling or controlled by or under common control with such specified Person from time to time. For the purposes of this definition, "control," when used with reference to any specified Person, means the power to direct the management and policies

of such specified Person, directly or indirectly, whether through the ownership of voting securities, by contract or otherwise; and the terms “controlling” and “controlled” have meanings correlative to the foregoing. In addition, “Person” shall mean any natural person, corporation, limited liability company, trust, joint venture, association, company, partnership or other entity.

## Risks and Limitations

Although the BIOC aims to exercise best practice and scrutiny on the price sources and the Index compilation procedures to ensure the Index is a representative and timely reflection of the cryptocurrency market, it may not be free from limitations under every scenario.

For the following reasons, the Index is subject to risks and limitations that are beyond the control of the BIOC, the following is not meant to be an exhaustive list, however, is a summary on some of the factors based on our best knowledge:

- Compared with traditional financial products trading, the cryptocurrency price sources face a number of unique risks, such as distributed denial-of-service (“DDoS”), hacking activity of the exchange or its user accounts, limited track record of some of the exchanges, fragmented liquidity across various trading platforms or even periods of illiquidity, and more frequent trading downtime of the exchanges or technical interruptions, ambiguity around the determination of hard forks and the identification of the primary cryptocurrency, uncertainty towards regulatory environment and definition or characterization of the cryptocurrencies in certain jurisdiction(s). Trading interruption of the price sources will affect the representativeness of the Indices.
- Only Cryptocurrencies trading in US dollar or equivalent on eligible exchanges are included for Index calculation, which means it is not an exhaustive collection of all pricing points of a cryptocurrency in the open market.
- Available Supply<sup>8</sup> might be subject to changes due to changes of supply mechanism, which will have an impact on the weightings of the applicable cryptocurrency accordingly.
- Although the BIOC will follow strictly this specified Index methodology to ensure a transparent and rule-based calculation, this methodology might not be fit for the use of all users. We are not in a position to advise as of the usefulness of the Index for a particular user case.
- The cryptocurrency is still a nascent asset class in its early stage of development, therefore, market is evolving fast and significant market changes will take place. For the Index to remain as a fair and accurate reflection of the market price, the BIOC will review and make adjustments to the Index methodology, as the committee deems appropriate, from time to time. Official announcement on the changes of Index methodology will be made on [BTC.com index webpage](#) for documentation.

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<sup>8</sup> Available Supply is the best approximation of the number of coins that are currently issued in the market and are potentially available for trade

- Although the BIOC exercises best effort to follow the Index methodology and accurately calculate the indices, under circumstances where material errors are found in the indices value post Index dissemination, the BIOC should make a notice on the [BTC.com index webpage](#) and/or notify the paid licensee of the Index in written upon uncovering of such error and the announce the corresponding corrective procedures. A number of factors should be considered to gauge the materiality of an error.

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