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# **Bitcart SDK**

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## INSTALLING BITCART SDK

Simply run

```
pip install bitcart
```

to install the library.

But to initialize bitcoin instance you will need `rpc_url`, `rpc_login` and `rpc_password` (not required, defaults work with default ports and authentication). For that you'll need Bitcart daemon, so:

```
git clone https://github.com/bitcart/bitcart
cd bitcart
pip install -r requirements/base.txt
pip install -r requirements/daemons/btc.txt
```

Everywhere here `coin_name` refers to coin you're going to run or use, `COIN_NAME` is the same name but in caps. For example if you run bitcoin, `coin_name=btc`, `COIN_NAME=BTC`, for litecoin `coin_name=ltc`, `COIN_NAME=LTC`.

Run `pip install -r requirements/daemons/coin_name.txt` to install requirements for daemon of `coin_name`.

This will clone main Bitcart repo and install dependencies, we recommend using `virtualenv` for consistency (some daemons conflict one with another, so using one `virtualenv` per daemon is fine).

To run daemon, just start it:

```
python daemons/btc.py
```

Or, to run it in background (linux only)

```
python daemons/btc.py &
```

Note, to run a few daemons, use `python daemons/coin_name.py` for each `coin_name`.

Default user is `electrum` and password is `electrumz`, it runs on <http://localhost:5000>. To run daemon in other network than `mainnet`, set `COIN_NAME_NETWORK` variable to network name (`testnet`, `regtest`). By default, if coin supports it, lightning network is enabled. To disable it, set `COIN_NAME_LIGHTNING` to `false`. For each daemon port is different. General scheme to get your daemon url is <http://localhost:port> Where port is the port your daemon uses. You can change port and host by using `COIN_NAME_HOST` and `COIN_NAME_PORT` env variables. Default ports are starting from 5000 and increase for each daemon by 1 (in order how they were added to Bitcart). Refer to main docs for ports information. Bitcoin port is 5000, litecoin is 5001, etc. So, to initialize your Bitcart instance right now, import it and use those settings:

```
from bitcart import BTC
btc = BTC(xpub="your (x/y/z)pub or (x/y/z)prv or electrum seed")
```

All the variables are actually optional, so you can just do `btc = BTC()` and use it, but without a wallet. To use a wallet, pass `xpub` like so: `btc = BTC(xpub="your x/y/zpub or x/y/zprv or electrum seed")` Xpub, xprv or electrum seed is the thing that represents your wallet. You can get it from your wallet provider, or, for testing or not, from [here](#).

You can configure default user and password in `conf/.env` file of cloned bitcart repo, like so:

```
COIN_NAME_USER=myuser  
COIN_NAME_PASS=mypassword
```

After that you can freely use bitcart methods, refer to [API docs](#) for more information.

## BITCART SDK EVENTS SYSTEM

### 2.1 Introduction

To be able to listen for incoming payments, transactions, new blocks or more, you should use events system.

In SDK, each event may have one handler.

One handler may handle multiple events at once

Using event system requires wallet.

Event handler signature is the following:

```
def handler(event, arg1, arg2):  
    pass # process event
```

Where `event` is the only required argument everywhere.

Depending on the event being handled, it may provide additional arguments. All arguments must be named exactly as event is specifying.

If using event system from APIManager, then additional required argument `instance` is passed:

```
def handler(instance, event, arg1, arg2):  
    pass # process event
```

Also, async handlers are supported too, like so:

```
async def handler(event, arg1, arg2):  
    pass # process event, you can await here
```

### 2.2 Registering event handlers

To register an event handler, use on decorator:

```
@coin.on("event")  
def handler(event, arg1, arg2):  
    pass
```

You can also register a handler for multiple events, then you should mark all arguments, except for `event` and `instance` (if provided) optional, like so:

```
@coin.on(["event1", "event2"])
def handler(event, arg1=None, arg2=None, arg3=None):
    pass # event argument can be used to get what event is currently being processed
```

Or you can use `add_event_handler` method instead:

```
def handler(event, arg1, arg2):
    pass

coin.add_event_handler("event", handler)
```

They work identically.

## 2.3 Events list

### 2.3.1 new\_block

Called when a new block is mined

Additional data:

- height (int): height of this block

### 2.3.2 new\_transaction

Called when a new transaction on this wallet has appeared

Additional data:

- tx (str): tx hash of this transaction

### 2.3.3 new\_payment

Called when status of payment request has changed. (See `get_request/add_request`)

Additional data:

- address (str): address related to this payment request
- status (int): new status code
- status\_str (str): string version of new status code

## 2.4 Listening for updates

To receive updates, you should use one of the available event delivery methods: polling or websocket



### 2.4.1 Polling

Polling is good for quick testing, but not very good for production.

In this method SDK calls `get_updates` daemon method constantly, processing any new updates received.

To use it, run:

```
coin.poll_updates()
```

It will start an infinite loop.

### 2.4.2 Websocket

Websocket is a bit harder to set up sometimes, but works better.

Instead of constantly calling daemon method to get updates, daemon will send updates when they are available via an established connection.

That way, you don't need to know your URL, you should only know daemon URL, and a channel between SDK and daemon will be set up.

To use it, run:

```
coin.start_websocket()
```

It will connect to your daemon's `/ws` endpoint, with auto-reconnecting in case of unexpected websocket close.

There may be unlimited number of websockets per wallet or not.

Under the hood, if using `APIManager`, daemon will send all its updates to SDK, and SDK will filter only the one you need.

If using coin object, daemon will only send updates about this wallet.

### 2.4.3 Manual updates processing

If you need complete control over updates delivery, you can pass updates to coin's method directly:

```
coin.process_updates(updates_list)
```

Where `updates_list` is a list of dictionaries.

Each dictionary must contain event key, and additional keys for data required for this event.

## 2.5 Processing updates for multiple wallets/currencies

If you need to process updates for multiple wallets/currencies, take a look at [APIManager documentation](#)



## APIMANAGER

APIManager provides an easy-to-use interface to manage multiple wallets/currencies.

### 3.1 Setup

Create APIManager like so:

```
manager = APIManager({"BTC": ["xpub1", "xpub2"], "currency2": ["xpub1", "xpub3"]})
```

This will load all specified wallets to the manager.

### 3.2 Accessing wallets

You can access wallets in a manager like so:

```
manager.BTC.xpub1 # access wallet <=> BTC(xpub="xpub1")  
# or  
manager["BTC"]["xpub1"] # same wallet, but via dict-like interface  
manager["currency2"]["xpub3"] # <=> currency2(xpub="xpub3")  
manager.BTC[xpub].balance() # <=> BTC(xpub=xpub).balance()
```

### 3.3 Adding new wallets to existing manager

```
manager.add_wallet("BTC", "xpub3") # adds wallet to currency BTC with xpub="xpub3"  
manager.add_wallets("currency2", ["xpub1", "xpub2"]) # batch add
```

### 3.4 Coin objects creation utilities

```
manager.load_wallet("currency", "xpub") # returns currency(xpub=xpub)  
manager.load_wallets("currency", ["xpub1", "xpub2"]) # returns a dict of xpub-  
↪ currency(xpub=xpub)
```

## 3.5 Listening for updates on all wallets in a manager

You can register event handlers like you did before, on individual coin instances, or globally on manager object.

```
@manager.on("new_transaction")
def handler(instance, event, tx):
    pass # instance is coin instance currently processing the event
```

To start connection to websocket, run:

```
manager.start_websocket()
```

## API REFERENCE

### 4.1 Implemented coins

#### 4.1.1 BTC

BTC class supports lightning out of the box. For lightning methods to work, it must be enabled from the daemon (enabled by default and edited by `BTC_LIGHTNING` environment variable). If lightning is disabled, `LightningDisabledError` is raised when calling lightning methods.

```
class bitcart.coins.btc.BTC(rpc_url: str | None = None, rpc_user: str | None = None, rpc_pass: str | None = None, xpub: str | None = None, proxy: str | None = None, session: ClientSession | None = None)
```

Bases: `Coin`, `EventDelivery`

```
ALLOWED_EVENTS = ['new_block', 'new_transaction', 'new_payment', 'verified_tx']
```

```
BALANCE_ATTRS = ['confirmed', 'unconfirmed', 'unmatured', 'lightning']
```

```
EXPIRATION_KEY = 'expiry'
```

```
RPC_PASS = 'electrumz'
```

```
RPC_URL = 'http://localhost:5000'
```

```
RPC_USER = 'electrum'
```

```
add_invoice(amount: int | str | Decimal, description: str = "", expire: int | float = 15) → dict
```

Create a lightning invoice

Create a lightning invoice and return invoice data with bolt invoice id All parameters are the same as in `add_request`

Example:

```
>>> a.add_invoice(0.5, "My invoice", 20)
{'time': 1562762334, 'amount': 50000000, 'exp': 1200, 'invoice': 'lnbc500m',...
```

#### Parameters

- **self** (`BTC`) – self
- **amount** (`AmountType`) – amount to open invoice
- **description** (`str`, *optional*) – Description of invoice. Defaults to “”.

- **expire** (*Union[int, float], optional*) – The time invoice will expire in. In minutes. Defaults to 15.

**Returns**

*dict* – Invoice data

**add\_request**(*amount: int | str | Decimal | None = None, description: str = "", expire: int | float = 15*) → *dict*

Add invoice

Create an invoice and request amount in BTC, it will expire by parameter provided. If expire is None, it will last forever.

Example:

```
>>> c.add_request(0.5, "My invoice", 20)
{'time': 1562762334, 'amount': 500000000, 'exp': 1200, 'address': 'xxx', ...}
```

**Parameters**

- **self** (*BTC*) – self
- **amount** (*Optional[AmountType]*) – amount to open invoice. Defaults to None.
- **description** (*str, optional*) – Description of invoice. Defaults to "".
- **expire** (*Union[int, float], optional*) – The time invoice will expire in. In minutes. Defaults to 15.

**Returns**

*dict* – Invoice data

**additional\_xpub\_fields**: *List[str] = []*

**balance**() → *dict*

Get balance of wallet

Example:

```
>>> c.balance()
{"confirmed": 0.000005, "unconfirmed": 0, "unmatured": 0}
```

**Returns**

*dict* – It should return dict of balance statuses

**close\_channel**(*channel\_id: str, force: bool = False*) → *str*

Close lightning channel

Close channel by channel\_id got from open\_channel, returns transaction id

**Parameters**

- **self** (*BTC*) – self
- **channel\_id** (*str*) – channel\_id from open\_channel
- **force** (*bool*) – Create new address beyond gap limit, if no more addresses are available.

**Returns**

*str* – tx\_id of closed channel

**coin\_name:** `str = 'BTC'`

**connect**(*connection\_string: str*) → bool

Connect to lightning node

connection string must respect format `pubkey@ipaddress`

**Parameters**

**connection\_string** (*str*) – connection string

**Returns**

*bool* – True on success, False otherwise

**friendly\_name:** `str = 'Bitcoin'`

**get\_address**(*address: str*) → list

Get address history

This method should return list of transaction informations for specified address

Example:

```
>>> c.get_address("31smpLFzLnza6k8tJbVpxXiatGjiEQDmzc")
[{'tx_hash': '7854bdf4c4e27276ecc1fb8d666d6799a248f5e81bdd58b16432d1ddd1d4c332',
  ↪ 'height': 581878, 'tx': ...
```

**Parameters**

**address** (*str*) – address to get transactions for

**Returns**

*list* – List of transactions

**get\_config**(*key: str, default: Any = None*) → Any

Get config key

If the key doesn't exist, default value is returned. Keys are stored in electrum's config file, check [bitcart.coins.btc.BTC.set\\_config\(\)](#) doc for details.

Example:

```
>>> c.get_config("x")
5
```

**Parameters**

- **self** (*BTC*) – self
- **key** (*str*) – key to get
- **default** (*Any, optional*) – The value to default to when key doesn't exist. Defaults to None.

**Returns**

*Any* – value of the key or default value provided

**get\_invoice**(*rhash: str*) → dict

Get lightning invoice info

Get lightning invoice information by rhash got from `add_invoice`

Example:

```
>>> c.get_invoice(
↳ "e34d7fb4cda66e0760fc193496c302055d0fd960cfd982432355c8bfeecd5f33")
{'is_lightning': True, 'amount_BTC': Decimal('0.5'), 'timestamp': 1619273042,
↳ 'expiry': 900, ...
```

**Parameters**

**rhash** (*str*) – invoice rhash

**Returns**

*dict* – invoice data

**get\_request**(*address: str*) → dict

Get invoice info

Get invoice information by address got from add\_request

Example:

```
>>> c.get_request("1A6jnc6xQwmhsChNLcyKAQNWPcWsVYqCqJ")
{'time': 1562762334, 'amount': 50000000, 'exp': 1200, 'address':
↳ '1A6jnc6xQwmhsChNLcyKAQNWPcWsVYqCqJ', ...
```

**Parameters**

- **self** (BTC) – self
- **address** (*str*) – address of invoice

**Returns**

*dict* – Invoice data

**get\_tx**(*tx: str*) → dict

Get transaction information

Given tx hash of transaction, return full information as dictionary

Example:

```
>>> c.get_tx("54604b116b28124e31d2d20bbd4561e6f8398dca4b892080bffc8c87c27762ba")
{'partial': False, 'version': 2, 'segwit_ser': True, 'inputs': [{'prevout_hash
↳ ': 'xxxx', ...
```

**Parameters**

**tx** (*str*) – tx\_hash

**Returns**

*dict* – transaction info

**help**() → list

Get help

Returns a list of all available RPC methods

**Returns**

*list* – RPC methods list



**history()** → dict

Get transaction history of wallet

Example:

```
>>> c.history()
{'summary': {'end_balance': '0.', 'end_date': None, 'from_height': None,
↳ 'incoming': '0.00185511',...
```

**Parameters**

**self** (BTC) – self

**Returns**

*dict* – dictionary with some data, where key transactions is list of transactions

**is\_eth\_based = False**

**list\_channels()** → list

List all channels ever opened

Possible channel statuses: OPENING, OPEN, CLOSED, DISCONNECTED

Example:

```
>>> a.server.list_channels()
[{'local_htlcs': {'adds': {}, 'locked_in': {}, 'settles': {}, 'fails': {}},
↳ 'remote_htlcs': ...
```

**Returns**

*list* – list of channels

**list\_peers**(*gossip: bool = False*) → list

Get a list of lightning peers

**Parameters**

**gossip** (*bool, optional*) – Whether to return peers of a gossip (one per node) or of a wallet. Defaults to False.

**Returns**

*list* – list of lightning peers

**lnpay**(*invoice: str*) → bool

Pay lightning invoice

Returns True on success, False otherwise

**Parameters**

**invoice** (*str*) – invoice to pay

**Returns**

*bool* – success or not

**property node\_id: Any**

Return an attribute of instance, which is of type owner.

**open\_channel**(*node\_id: str, amount: int | str | Decimal*) → str

Open lightning channel

Open channel with node, returns string of format txid:output\_index

**Parameters**

- **self** (BTC) – self
- **node\_id** (str) – id of node to open channel with
- **amount** (AmountType) – amount to open channel

**Returns**

str – string of format txid:output\_index

**pay\_to**(address: str, amount: int | str | Decimal, fee: int | str | Decimal | Callable | None = None, feerate: int | str | Decimal | None = None, broadcast: bool = True) → dict | str

Pay to address

This function creates a transaction, your wallet must have sufficient balance and address must exist.

Examples:

```
>>> btc.pay_to("mkHS9ne12qx9pS9VojpwU5xtRd4T7X7ZUt", 0.001)
'608d9af34032868fd2849723a4de9ccd874a51544a7fba879a18c847e37e577b'
```

```
>>> btc.pay_to("mkHS9ne12qx9pS9VojpwU5xtRd4T7X7ZUt",0.001, feerate=1)
'23d0aec06f6ea6100ba9c6ce8a1fa5d333a6c1d39a780b5fadc4b2836d71b66f'
```

```
>>> btc.pay_to("mkHS9ne12qx9pS9VojpwU5xtRd4T7X7ZUt", 0.001, broadcast=False)
{'hex': '020000000026....', 'complete': True, 'final': False, 'name': None,
 ← 'csv_delay': 0, 'cltv_expiry': 0}
```

**Parameters**

- **self** (BTC) – self
- **address** (str) – address where to send BTC
- **amount** (AmountType) – amount of bitcoins to send
- **fee** (Optional[Union[AmountType, Callable]], optional) – Either a fixed fee, or a callable getting size and default fee as argument and returning fee. Defaults to None.
- **feerate** (Optional[AmountType], optional) – A sat/byte feerate, can't be passed together with fee argument. Defaults to None.
- **broadcast** (bool, optional) – Whether to broadcast transaction to network. Defaults to True.

**Raises**

**TypeError** – if you have provided both fee and feerate

**Returns**

Union[dict, str] – tx hash of ready transaction or raw transaction, depending on broadcast argument.

**pay\_to\_many**(outputs: Iterable[dict | tuple], fee: int | str | Decimal | Callable | None = None, feerate: int | str | Decimal | None = None, broadcast: bool = True) → dict | str

Pay to multiple addresses(batch transaction)

This function creates a batch transaction, your wallet must have sufficient balance and addresses must exist. outputs parameter is either an iterable of (address, amount) tuples(or any iterables) or a dict with two keys: address and amount {"address": "someaddress", "amount": 0.5}

Examples:

```
>>> btc.pay_to_many([{"address": "mkHS9ne12qx9pS9VojpwU5xtRd4T7X7ZUt", "amount": 0.001}, {"address": "mv4rnyY3Su5gjcDNzbMLKBQkBicCtHUtFB", "amount": 0.0001}])
'60fa120d9f868a7bd03d6bbd1e225923cab0ba7a3a6b961861053c90365ed40a'
```

```
>>> btc.pay_to_many(("mkHS9ne12qx9pS9VojpwU5xtRd4T7X7ZUt", 0.001), ("mv4rnyY3Su5gjcDNzbMLKBQkBicCtHUtFB", 0.0001))
'd80f14e20af2ceaa43a8b7e15402d420246d39e235d87874f929977fb0b1cab8'
```

```
>>> btc.pay_to_many(("mkHS9ne12qx9pS9VojpwU5xtRd4T7X7ZUt", 0.001), ("mkHS9ne12qx9pS9VojpwU5xtRd4T7X7ZUt", 0.001), feerate=1)
'0a6611876e04a6f2742eac02d4fac4c242dda154d85f0d547bbac1a33dbbbe34'
```

```
>>> btc.pay_to_many(("mkHS9ne12qx9pS9VojpwU5xtRd4T7X7ZUt", 0.001), ("mv4rnyY3Su5gjcDNzbMLKBQkBicCtHUtFB", 0.0001), broadcast=False)
{'hex': '02000000...', 'complete': True, 'final': False}
```

### Parameters

- **self** (BTC) – self
- **outputs** (*Iterable[Union[dict, tuple]]*) – An iterable with dictionary or iterable as the item
- **fee** (*Optional[Union[AmountType, Callable]]*, *optional*) – Either a fixed fee, or a callable getting size and default fee as argument and returning fee. Defaults to None.
- **feerate** (*Optional[AmountType]*, *optional*) – A sat/byte feerate, can't be passed together with fee argument. Defaults to None.
- **broadcast** (*bool*, *optional*) – Whether to broadcast transaction to network. Defaults to True.

### Raises

**TypeError** – if you have provided both fee and feerate

### Returns

*Union[dict, str]* – tx hash of ready transaction or raw transaction, depending on broadcast argument.

**poll\_updates**(*timeout: int | float = 1*) → None

Poll updates

Poll daemon for new transactions in wallet, this will block forever in while True loop checking for new transactions

Example can be found on main page of docs

### Parameters

- **self** (BTC) – self
- **timeout** (*Union[int, float]*, *optional*) – seconds to wait before requesting transactions again. Defaults to 1.

### Returns

*None* – This function runs forever

**process\_updates**(*updates: Iterable[dict], \*args: Any, pass\_instance: bool = False, \*\*kwargs: Any*) → None

**set\_config**(*key: str, value: Any*) → bool

Set config key to specified value

It sets the config value in electrum's config store, usually \$HOME/.electrum/config

You can set any keys and values using this function(as long as JSON serializable), and some are used to configure underlying electrum daemon.

Example:

```
>>> c.set_config("x", 5)
True
```

**Parameters**

- **self** (BTC) – self
- **key** (*str*) – key to set
- **value** (*Any*) – value to set

**Returns**

*bool* – True on success, False otherwise

**property spec:** **Any**

Return an attribute of instance, which is of type owner.

**start\_websocket**(*reconnect\_callback: Callable | None = None, force\_connect: bool = False, auto\_reconnect: bool = True*) → None

Start a websocket connection to daemon

**Parameters**

- **reconnect\_callback** (*Optional[Callable], optional*) – Callback to be called right after each succesful connection. Defaults to None.
- **force\_connect** (*bool, optional*) – Whether to try reconnecting even on first failure (handshake) to daemon. Defaults to False.
- **auto\_reconnect** (*bool, optional*) – Whether to enable auto-reconnecting on websocket closing. Defaults to True.

**validate\_key**(*key: str, \*args: Any, \*\*kwargs: Any*) → bool

Validate whether provided key is valid to restore a wallet

If the key is x/y/z pub/prv or electrum seed at the network daemon is running at, then it would be valid(True), else False

Examples:

```
>>> c.validate_key("test")
False
```

```
>>> c.validate_key("your awesome electrum seed")
True
```

```
>>> c.validate_key("x/y/z pub/prv here")
True
```

**Parameters**

- **self** (BTC) – self
- **key** (str) – key to check

**Returns**

*bool* – Whether the key is valid or not

**xpub\_name:** str = 'Xpub'

## 4.1.2 BCH

BCH supports Schnorr signatures, they are enabled out of the box

```
class bitcart.coins.bch.BCH(rpc_url: str | None = None, rpc_user: str | None = None, rpc_pass: str | None = None, xpub: str | None = None, proxy: str | None = None, session: ClientSession | None = None)
```

Bases: *BTC*

**AMOUNT\_FIELD** = 'amount (BCH)'

**EXPIRATION\_KEY** = 'expiration'

**RPC\_URL** = 'http://localhost:5004'

**coin\_name:** str = 'BCH'

**event\_handlers:** Dict[str, Callable]

**friendly\_name:** str = 'Bitcoin Cash'

**history()** → dict

Get transaction history of wallet

Example:

```
>>> c.history()
{'summary': {'end_balance': '0.', 'end_date': None, 'from_height': None,
→ 'incoming': '0.00185511', ...
```

**Parameters**

**self** (BTC) – self

**Returns**

*dict* – dictionary with some data, where key transactions is list of transactions

**property node\_id:** Any

Return an attribute of instance, which is of type owner.

**server:** RPCProxy

**property spec:** Any

Return an attribute of instance, which is of type owner.

**xpub:** str | None

### 4.1.3 XMR

XMR support is based on our custom daemon implementation which tries to follow electrum APIs as closely as possible

```
class bitcart.coins.xmr.XMR(rpc_url: str | None = None, rpc_user: str | None = None, rpc_pass: str | None = None, xpub: str | None = None, proxy: str | None = None, session: ClientSession | None = None)
```

Bases: *ETH*

**RPC\_URL** = 'http://localhost:5011'

**additional\_xpub\_fields:** List[str] = ['address']

**coin\_name:** str = 'XMR'

**event\_handlers:** Dict[str, Callable]

**friendly\_name:** str = 'Monero'

**get\_address**(\*args: Any, \*\*kwargs: Any) → NoReturn

Get address history

This method should return list of transaction informations for specified address

Example:

```
>>> c.get_address("31smpLFzLnza6k8tJbVpxXiatGjiEQDmzc")
[{'tx_hash': '7854bdf4c4e27276ecc1fb8d666d6799a248f5e81bdd58b16432d1ddd1d4c332',
  ↪ 'height': 581878, 'tx': ...
```

#### Parameters

**address** (str) – address to get transactions for

#### Returns

*list* – List of transactions

**history**() → dict

Get transaction history of wallet

Example:

```
>>> c.history()
{'summary': {'end_balance': '0.', 'end_date': None, 'from_height': None,
  ↪ 'incoming': '0.00185511', ...
```

#### Parameters

**self** (BTC) – self

#### Returns

*dict* – dictionary with some data, where key transactions is list of transactions

**property node\_id: Any**

Return an attribute of instance, which is of type owner.

**pay\_to\_many(\*args: Any, \*\*kwargs: Any) → NoReturn**

Pay to multiple addresses(batch transaction)

This function creates a batch transaction, your wallet must have sufficient balance and addresses must exist. outputs parameter is either an iterable of (address, amount) tuples(or any iterables) or a dict with two keys: address and amount {"address": "someaddress", "amount": 0.5}

Examples:

```
>>> btc.pay_to_many([{"address": "mkHS9ne12qx9pS9VojpwU5xtRd4T7X7ZUt", "amount": 0.001}, {"address": "mv4rnyY3Su5gjcDNzbMLKBQkBicCtHUtFB", "amount": 0.0001}])
'60fa120d9f868a7bd03d6bbd1e225923cab0ba7a3a6b961861053c90365ed40a'
```

```
>>> btc.pay_to_many([("mkHS9ne12qx9pS9VojpwU5xtRd4T7X7ZUt", 0.001), ("mv4rnyY3Su5gjcDNzbMLKBQkBicCtHUtFB", 0.0001)])
'd80f14e20af2ceaa43a8b7e15402d420246d39e235d87874f929977fb0b1cab8'
```

```
>>> btc.pay_to_many(("mkHS9ne12qx9pS9VojpwU5xtRd4T7X7ZUt", 0.001), ("mkHS9ne12qx9pS9VojpwU5xtRd4T7X7ZUt", 0.001), feerate=1)
'0a6611876e04a6f2742eac02d4fac4c242dda154d85f0d547bbac1a33dbbbe34'
```

```
>>> btc.pay_to_many([("mkHS9ne12qx9pS9VojpwU5xtRd4T7X7ZUt", 0.001), ("mv4rnyY3Su5gjcDNzbMLKBQkBicCtHUtFB", 0.0001)], broadcast=False)
{'hex': '02000000...', 'complete': True, 'final': False}
```

**Parameters**

- **self** (BTC) – self
- **outputs** (*Iterable[Union[dict, tuple]]*) – An iterable with dictionary or iterable as the item
- **fee** (*Optional[Union[AmountType, Callable]]*, *optional*) – Either a fixed fee, or a callable getting size and default fee as argument and returning fee. Defaults to None.
- **feerate** (*Optional[AmountType]*, *optional*) – A sat/byte feerate, can't be passed together with fee argument. Defaults to None.
- **broadcast** (*bool*, *optional*) – Whether to broadcast transaction to network. Defaults to True.

**Raises**

**TypeError** – if you have provided both fee and feerate

**Returns**

*Union[dict, str]* – tx hash of ready transaction or raw transaction, depending on broadcast argument.

**server: RPCProxy****property spec: Any**

Return an attribute of instance, which is of type owner.

**xpub: str | None**

```
xpub_name: str = 'Secret viewkey'
```

#### 4.1.4 ETH

ETH support is based on our custom daemon implementation which tries to follow electrum APIs as closely as possible

```
class bitcart.coins.eth.ETH(rpc_url: str | None = None, rpc_user: str | None = None, rpc_pass: str | None = None, xpub: str | None = None, proxy: str | None = None, session: ClientSession | None = None)
```

Bases: *BTC*

```
ALLOWED_EVENTS = ['new_block', 'new_transaction', 'new_payment']
```

```
EXPIRATION_KEY = 'expiration'
```

```
RPC_URL = 'http://localhost:5002'
```

```
coin_name: str = 'ETH'
```

```
event_handlers: Dict[str, Callable]
```

```
friendly_name: str = 'Ethereum'
```

```
get_address(*args: Any, **kwargs: Any) → NoReturn
```

Get address history

This method should return list of transaction informations for specified address

Example:

```
>>> c.get_address("31smpLFzLnza6k8tJbVpxXiatGjiEQDmzc")
[{'tx_hash': '7854bdf4c4e27276ecc1fb8d666d6799a248f5e81bdd58b16432d1ddd1d4c332',
  ↪ 'height': 581878, 'tx': ...
```

##### Parameters

**address** (*str*) – address to get transactions for

##### Returns

*list* – List of transactions

```
history() → dict
```

Get transaction history of wallet

Example:

```
>>> c.history()
{'summary': {'end_balance': '0.', 'end_date': None, 'from_height': None,
  ↪ 'incoming': '0.00185511', ...
```

##### Parameters

**self** (*BTC*) – self

##### Returns

*dict* – dictionary with some data, where key transactions is list of transactions



**is\_eth\_based = True**

**property node\_id: Any**

Return an attribute of instance, which is of type owner.

**pay\_to\_many(\*args: Any, \*\*kwargs: Any) → NoReturn**

Pay to multiple addresses(batch transaction)

This function creates a batch transaction, your wallet must have sufficient balance and addresses must exist. outputs parameter is either an iterable of (address, amount) tuples(or any iterables) or a dict with two keys: address and amount {"address": "someaddress", "amount": 0.5}

Examples:

```
>>> btc.pay_to_many([{"address": "mkHS9ne12qx9pS9VojpwU5xtRd4T7X7ZUt", "amount": 0.001}, {"address": "mv4rnyY3Su5gjcDNzbMLKBQkBicCtHUtFB", "amount": 0.0001}])
↪ '60fa120d9f868a7bd03d6bbd1e225923cab0ba7a3a6b961861053c90365ed40a'
```

```
>>> btc.pay_to_many([("mkHS9ne12qx9pS9VojpwU5xtRd4T7X7ZUt", 0.001), ("mv4rnyY3Su5gjcDNzbMLKBQkBicCtHUtFB", 0.0001)])
↪ 'd80f14e20af2ceaa43a8b7e15402d420246d39e235d87874f929977fb0b1cab8'
```

```
>>> btc.pay_to_many(("mkHS9ne12qx9pS9VojpwU5xtRd4T7X7ZUt", 0.001), ("mkHS9ne12qx9pS9VojpwU5xtRd4T7X7ZUt", 0.001), feerate=1)
↪ '0a6611876e04a6f2742eac02d4fac4c242dda154d85f0d547bbac1a33dbbbe34'
```

```
>>> btc.pay_to_many([("mkHS9ne12qx9pS9VojpwU5xtRd4T7X7ZUt", 0.001), ("mv4rnyY3Su5gjcDNzbMLKBQkBicCtHUtFB", 0.0001)], broadcast=False)
↪ {'hex': '0200000...', 'complete': True, 'final': False}
```

### Parameters

- **self** (BTC) – self
- **outputs** (*Iterable[Union[dict, tuple]]*) – An iterable with dictionary or iterable as the item
- **fee** (*Optional[Union[AmountType, Callable]]*, *optional*) – Either a fixed fee, or a callable getting size and default fee as argument and returning fee. Defaults to None.
- **feerate** (*Optional[AmountType]*, *optional*) – A sat/byte feerate, can't be passed together with fee argument. Defaults to None.
- **broadcast** (*bool*, *optional*) – Whether to broadcast transaction to network. Defaults to True.

### Raises

**TypeError** – if you have provided both fee and feerate

### Returns

*Union[dict, str]* – tx hash of ready transaction or raw transaction, depending on broadcast argument.

**server: RPCProxy**

**property spec: Any**

Return an attribute of instance, which is of type owner.

```
xpub: str | None
xpub_name: str = 'Address'
```

### 4.1.5 BNB

BNB support is based on our custom daemon implementation which tries to follow electrum APIs as closely as possible

```
class bitcart.coins.bnb.BNB(rpc_url: str | None = None, rpc_user: str | None = None, rpc_pass: str | None = None, xpub: str | None = None, proxy: str | None = None, session: ClientSession | None = None)
```

Bases: *ETH*

```
RPC_URL = 'http://localhost:5006'
```

```
coin_name: str = 'BNB'
```

```
event_handlers: Dict[str, Callable]
```

```
friendly_name: str = 'Binance Smart Chain'
```

```
property node_id: Any
```

Return an attribute of instance, which is of type owner.

```
server: RPCProxy
```

```
property spec: Any
```

Return an attribute of instance, which is of type owner.

```
xpub: str | None
```

### 4.1.6 SmartBCH

SmartBCH support is based on our custom daemon implementation which tries to follow electrum APIs as closely as possible

```
class bitcart.coins.sbch.SBCH(rpc_url: str | None = None, rpc_user: str | None = None, rpc_pass: str | None = None, xpub: str | None = None, proxy: str | None = None, session: ClientSession | None = None)
```

Bases: *ETH*

```
RPC_URL = 'http://localhost:5007'
```

```
coin_name: str = 'SBCH'
```

```
event_handlers: Dict[str, Callable]
```

```
friendly_name: str = 'Smart Bitcoin Cash'
```

```
property node_id: Any
```

Return an attribute of instance, which is of type owner.

```
server: RPCProxy
```

**property spec:** Any

Return an attribute of instance, which is of type owner.

**xpub:** str | None

### 4.1.7 Polygon (MATIC)

Polygon (MATIC) support is based on our custom daemon implementation which tries to follow electrum APIs as closely as possible

```
class bitcart.coins.matic.MATIC(rpc_url: str | None = None, rpc_user: str | None = None, rpc_pass: str | None = None, xpub: str | None = None, proxy: str | None = None, session: ClientSession | None = None)
```

Bases: *ETH*

**RPC\_URL** = 'http://localhost:5008'

**coin\_name:** str = 'MATIC'

**event\_handlers:** Dict[str, Callable]

**friendly\_name:** str = 'Polygon'

**property node\_id:** Any

Return an attribute of instance, which is of type owner.

**server:** RPCProxy

**property spec:** Any

Return an attribute of instance, which is of type owner.

**xpub:** str | None

### 4.1.8 TRON (TRX)

TRON (TRX) support is based on our custom daemon implementation which tries to follow electrum APIs as closely as possible

```
class bitcart.coins.trx.TRX(rpc_url: str | None = None, rpc_user: str | None = None, rpc_pass: str | None = None, xpub: str | None = None, proxy: str | None = None, session: ClientSession | None = None)
```

Bases: *ETH*

**RPC\_URL** = 'http://localhost:5009'

**coin\_name:** str = 'TRX'

**event\_handlers:** Dict[str, Callable]

**friendly\_name:** str = 'Tron'

**property node\_id:** Any

Return an attribute of instance, which is of type owner.

**server:** RPCProxy

**property spec:** Any

Return an attribute of instance, which is of type owner.

**xpub:** str | None

### 4.1.9 XRG

XRG supports Schnorr signatures, they are enabled out of the box

```
class bitcart.coins.xrg.XRG(rpc_url: str | None = None, rpc_user: str | None = None, rpc_pass: str | None = None, xpub: str | None = None, proxy: str | None = None, session: ClientSession | None = None)
```

Bases: *BCH*

**AMOUNT\_FIELD** = 'amount (XRG)'

**RPC\_URL** = 'http://localhost:5005'

**coin\_name:** str = 'XRG'

**event\_handlers:** Dict[str, Callable]

**friendly\_name:** str = 'Ergon'

**property node\_id:** Any

Return an attribute of instance, which is of type owner.

**server:** RPCProxy

**property spec:** Any

Return an attribute of instance, which is of type owner.

**xpub:** str | None

### 4.1.10 LTC

LTC class supports lightning out of the box. For lightning methods to work, it must be enabled from the daemon (enabled by default and edited by `LTC_LIGHTNING` environment variable). If lightning is disabled, `LightningDisabledError` is raised when calling lightning methods.

```
class bitcart.coins.ltc.LTC(rpc_url: str | None = None, rpc_user: str | None = None, rpc_pass: str | None = None, xpub: str | None = None, proxy: str | None = None, session: ClientSession | None = None)
```

Bases: *BTC*

**RPC\_URL** = 'http://localhost:5001'

**coin\_name:** str = 'LTC'

**event\_handlers:** Dict[str, Callable]

**friendly\_name:** str = 'Litecoin'

**property node\_id:** Any

Return an attribute of instance, which is of type owner.

**server:** RPCProxy

**property spec:** Any

Return an attribute of instance, which is of type owner.

**xpub:** str | None

#### 4.1.11 BSTY

BSTY class supports lightning out of the box. For lightning methods to work, it must be enabled from the daemon (enabled by default and edited by BSTY\_LIGHTNING environment variable). If lightning is disabled, LightningDisabledError is raised when calling lightning methods.

```
class bitcart.coins.bsty.BSTY(rpc_url: str | None = None, rpc_user: str | None = None, rpc_pass: str | None = None, xpub: str | None = None, proxy: str | None = None, session: ClientSession | None = None)
```

Bases: *BTC*

**RPC\_URL =** 'http://localhost:5003'

**coin\_name:** str = 'BSTY'

**event\_handlers:** Dict[str, Callable]

**friendly\_name:** str = 'GlobalBoost'

**property node\_id:** Any

Return an attribute of instance, which is of type owner.

**server:** RPCProxy

**property spec:** Any

Return an attribute of instance, which is of type owner.

**xpub:** str | None

#### 4.1.12 GRS

GRS class supports lightning out of the box. For lightning methods to work, it must be enabled from the daemon (enabled by default and edited by GRS\_LIGHTNING environment variable). If lightning is disabled, LightningDisabledError is raised when calling lightning methods.

```
class bitcart.coins.grs.GRS(rpc_url: str | None = None, rpc_user: str | None = None, rpc_pass: str | None = None, xpub: str | None = None, proxy: str | None = None, session: ClientSession | None = None)
```

Bases: *BTC*

**RPC\_URL =** 'http://localhost:5010'

**coin\_name:** str = 'GRS'

**event\_handlers:** Dict[str, Callable]

**friendly\_name:** str = 'Groestlcoin'

**property node\_id:** *Any*

Return an attribute of instance, which is of type owner.

**server:** *RPCProxy*

**property spec:** *Any*

Return an attribute of instance, which is of type owner.

**xpub:** *str | None*

## 4.2 Utilities

`bitcart.utils.bitcoins(amount: int) → Decimal`

Convert amount from satoshis to bitcoins

**Parameters**

**amount** (*int*) – amount in satoshis

**Returns**

*Decimal* – amount in bitcoins

`async bitcart.utils.call_universal(func: Callable, *args: Any, **kwargs: Any) → Any`

Call a function: async or sync one. All passed arguments are passed to the function too

**Parameters**

**func** (*Callable*) – a function to call: either sync or async one

**Returns**

*Any* – function execution result

`bitcart.utils.convert_amount_type(amount: str | Decimal) → Decimal`

Convert amount from str to Decimal

**Parameters**

**amount** (*Union[str, Decimal]*) – amount

**Returns**

*Decimal*

`bitcart.utils.json_encode(obj: Any) → Any`

json.dumps supporting Decimals

**Parameters**

**obj** (*Any*) – any object

**Returns**

*Any* – return value of json.dumps

`bitcart.utils.satoshis(amount: str | Decimal) → int`

Convert amount from bitcoins to satoshis

**Parameters**

**amount** (*Union[str, Decimal]*) – bitcoin amount

**Returns**

*int* – same amount in satoshis

Bitcart is a platform to simplify cryptocurrencies adaptation. This SDK is part of Bitcart. Using this SDK you can easily connect to Bitcart daemon and code scripts around it easily.

Behold, the power of Bitcart:

```
from bitcart import BTC

btc = BTC(xpub="your (x/y/z)pub or (x/y/z)prv or electrum seed")

@btc.on("new_transaction")
def callback_func(event, tx):
    print(event)
    print(tx)

btc.poll_updates()
```

This simple script will listen for any new transaction on your wallet's addresses and print information about them like so:

```
alex@PC:/media/alex/D/github/bitcart-sdk$ python3 t.py
new_transaction
821eb67c9403fa3caaa00f297652be0d62e85b910780aefac007231cae17a550
```

And if you add `print(btc.get_tx(tx))` it would print full information about every transaction, too!

To run this script, refer to [installation](#) section. For examples of usage, check examples directory in github repository.

Supported coins list( means lightning is supported):

- Bitcoin ()
- Bitcoin Cash
- Monero
- Ethereum
- Binance coin (BNB)
- SmartBCH
- Polygon (MATIC)
- Tron (TRX)
- Ergon
- Litecoin ()
- Globalboost ()
- Groestlcoin ()

To use proxy, install optional dependencies:

```
pip install bitcart[proxy] HTTP, SOCKS4 and SOCKS5 proxies supported.
```

To use, pass proxy url to coin constructor:

```
btc = BTC(proxy="socks5://localhost:9050")
```



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