

# Sending bitcoins with the command line – P2PKH

## 1) Sendtoaddress

We create a first transaction sending 1 bitcoin to Alice address.  
Alice will then have a UTXO at her disposal.

```
sendtoaddress n4SvybJicv79X1Uc4o3fYXWGwXadA53FSq 1  
21c89dd86b0d8ce8addc1e11a6a2b35aab59715300c484d74ca2ef4af0bb0c64
```

Transaction ID (txid)

## 2) Gettransaction

We inspect the transaction details using the transaction ID.  
We note the output index (named “vout”).

```
gettransaction 21c89dd86b0d8ce8addc1e11a6a2b35aab59715300c484d74ca2ef4af0bb0c64  
{  
  "amount": 0.00000000,  
  "fee": -0.00003360,  
  "confirmations": 0,  
  "trusted": true,  
  "txid": "21c89dd86b0d8ce8addc1e11a6a2b35aab59715300c484d74ca2ef4af0bb0c64",  
  "walletconflicts": [  
  ],  
  "time": 1549879552,  
  "timereceived": 1549879552,  
  "bip125-replaceable": "yes",  
  "details": [  
    {  
      "address": "n4SvybJicv79X1Uc4o3fYXWGwXadA53FSq",  
      "category": "send",  
      "amount": -1.00000000,  
      "label": "autogen_alice",  
      "vout": 1,  
      "fee": -0.00003360,  
      "abandoned": false  
    },  
    {  
      "address": "n4SvybJicv79X1Uc4o3fYXWGwXadA53FSq",  
      "category": "receive",  
      "amount": 1.00000000,  
      "label": "autogen_alice",  
      "vout": 1  
    }  
  ],  
  "hex":  
  "02000000001014647b42a84f9b26af701f6ae76b462b24067b5c7b9920a6455e599ca59ed958b0000000171600143c7868f3da5b49a9823314f73f259  
a914fb8820f35efffa054399540b8ca86040d8ddaa4d588ac024730440220602fe8a516307008007b2d6119bc57998cab3d980938995c85bd8586b38221b  
525781b15787a616d50ba745925f1c7dd87000000"  
}
```

Alice address

### 3) Getrawtransaction

We inspect the raw transaction using the same transaction ID.

We observe the same output index (named "n").

We know it is the second output (index 1) because of the amount and the address.

```
getrawtransaction 21c89dd86b0d8ce8addc1e11a6a2b35aab59715300c484d74ca2ef4af0bb0c64 true
{
  "txid": "21c89dd86b0d8ce8addc1e11a6a2b35aab59715300c484d74ca2ef4af0bb0c64",
  "hash": "2413db7ca92085a053c88f156d9b815cf79c6428d15c528b00748de5964e69b",
  "version": 2,
  "size": 249,
  "vsize": 168,
  "weight": 669,
  "locktime": 135,
  "vin": [
    {
      "txid": "8b95ed59ca99e555640a92b9c7b56740b262b476ae601f76ab2f9842ab44746",
      "vout": 0,
      "scriptSig": {
        "asm": "00143c7868f3da5b49a9823314f73f259b0c1f214c26",
        "hex": "1600143c7868f3da5b49a9823314f73f259b0c1f214c26"
      },
      "txinwitness": [
        "30440220602fe8a516307008007b2d6119bc57998cab3d980938995c85bd8586b38221bf022057e3d6b593d9a9f11e748e7867accac85d64a3669a9f3a77c7e961cfa82fdb01",
        "020ccac4e8144689110d16f69cf21b7cb525781b15787a616d50ba745925f1c7dd"
      ],
      "sequence": 4294967293
    }
  ],
  "vout": [
    {
      "value": 45.99986180,
      "n": 0,
      "scriptPubKey": {
        "asm": "OP_HASH160 76067966e02ba70b56760e514b564ecf6be38c67 OP_EQUAL",
        "hex": "a91476067966e02ba70b56760e514b564ecf6be38c6787",
        "reqSigs": 1,
        "type": "scripthash",
        "addresses": [
          "2N41HukryQHLXTEpSsd3rdaapGMF7raEasqz"
        ]
      }
    },
    {
      "value": 1.00000000,
      "n": 1,
      "scriptPubKey": {
        "asm": "OP_DUP OP_HASH160 fb8820f35effa054399540b8ca86040d8ddaa4d5 OP_EQUALVERIFY OP_CHECKSIG",
        "hex": "76a914fb8820f35effa054399540b8ca86040d8ddaa4d588ac",
        "reqSigs": 1,
        "type": "pubkeyhash",
        "addresses": [
          "n4SvybJicv79X1Uc4o3fYXNGwXadA53FSq"
        ]
      }
    }
  ],
  "hex": "020000000001014647b42a84f9b26af701f6ae76b462b24067b5c7b9920a6455e599ca59ed958b0000000171600143c7868f3da5b49a9823314f73f259b0c1f214c26fdffff0204382e120100a914fb8820f35effa054399540b8ca86040d8ddaa4d588ac024730440220602fe8a516307008007b2d6119bc57998cab3d980938995c85bd8586b38221bf022057e3d6b593d9a9f11e748e7867acc525781b15787a616d50ba745925f1c7dd87000000"
}
```

#### 4) Listunspent

We check that we have the UTXO at our disposal with the listunspent command. The UTXO is only listed if it has one confirmation. So we need to generate one block if it's not listed. (generate 1).

```
{
  "txid": "21c89dd86b0d8ce8addc1e11a6a2b35aab59715300c484d74ca2ef4af0bb0c64",
  "vout": 0,
  "address": "2N41HUKryQHLXTEpSsd3rdaqnCMFYaEasqz",
  "redeemScript": "00149154f1eb3dbd3ebb8ae8181ea7ce9ca4fc1980ff",
  "scriptPubKey": "a91476067966e02ba70b56760e514b564ecf6be38c6787",
  "amount": 45.99986180,
  "confirmations": 6,
  "spendable": true,
  "solvable": true,
  "safe": true
},
{
  "txid": "21c89dd86b0d8ce8addc1e11a6a2b35aab59715300c484d74ca2ef4af0bb0c64",
  "vout": 1,
  "address": "n4SvybJicv79X1Uc4o3fYXWGwXadA53FSq",
  "label": "autogen_alice",
  "scriptPubKey": "76a914fb8820f35effa054399540b8ca86040d8ddaa4d588ac",
  "amount": 1.00000000,
  "confirmations": 6,
  "spendable": true,
  "solvable": true,
  "safe": true
},
{
  "txid": "10b82af0c60ddb9d52d9f6d44c69ab792701133a2ef0f7530320ffd8405b9e67",
  "vout": 0,
  "address": "mvxYBJFvNGb5Za6M5WeK8DYjFrBX5UvDbr",
  "scriptPubKey": "2103bdc66baf1c305ffc5364f237c00de4bd40b59c0ab8535aacfbee3cdec9cb24bac",
  "amount": 50.00000000,
  "confirmations": 138,
  "spendable": true,
  "solvable": true,
  "safe": true
},
{
  "txid": "4cff3a3ed15361e06340d75476f71f163da1f00cd540f5534e2490bd04127368",
  "vout": 0,
  "address": "mvxYBJFvNGb5Za6M5WeK8DYjFrBX5UvDbr",
  "scriptPubKey": "2103bdc66baf1c305ffc5364f237c00de4bd40b59c0ab8535aacfbee3cdec9cb24bac",
  "amount": 50.00000000,
  "confirmations": 120,
  "spendable": true
}
```

## 5) Createrawtransaction

We create the spending transaction specifying the input as first argument (txid + output index) and the output as second argument (recipient address + amount).  
The amount difference between input and output is automatically allocated as mining fees.

```
createrawtransaction [{"txid": "21c89dd86b0d8ce8addc1e11a6a2b35aab59715300c484d74ca2ef4af0bb0c64", "vout": 1}] [{"mfsqh18UT3XjpJ8yVeiM7YX1mLxq5REG9d": 0.999}]'
0200000001640cbbf04aefa24cd784c400537159ab5ab3a2a6111edcde88c0d6bd89dc8210100000000ffffffffff01605af405000000001976a91403f338e0f898ef40f1eb6734dc1f5aa72a4161f888ac00000000
```

Raw transaction in hexadecimal format

## 6) Decoderawtransaction

We decode the raw transaction.

We observe that the input (vin) contains the output reference (txid + index), but the input script (scriptSig) is empty.

We have one output (vout) with the amount and address we specified.

```
decoderawtransaction
0200000001640cbbf04aefa24cd784c400537159ab5ab3a2a6111edcde88c0d6bd89dc8210100000000ffffffffff01605af405000000001976a91403f338e0f898ef40f1eb6734dc1f5aa72a4161f888ac00000000
{
  "txid": "462522d069a95d9ae34a3cf4b1822f6f6a0d2c9d5e7c478daa88f6f41027c966",
  "hash": "462522d069a95d9ae34a3cf4b1822f6f6a0d2c9d5e7c478daa88f6f41027c966",
  "version": 2,
  "size": 85,
  "vsize": 85,
  "weight": 340,
  "locktime": 0,
  "vin": [
    {
      "txid": "21c89dd86b0d8ce8addc1e11a6a2b35aab59715300c484d74ca2ef4af0bb0c64",
      "vout": 1,
      "scriptSig": {
        "asm": "",
        "hex": ""
      },
      "sequence": 4294967295
    }
  ],
  "vout": [
    {
      "value": 0.99900000,
      "n": 0,
      "scriptPubKey": {
        "asm": "OP_DUP OP_HASH160 03f338e0f898ef40f1eb6734dc1f5aa72a4161f8 OP_EQUALVERIFY OP_CHECKSIG",
        "hex": "76a91403f338e0f898ef40f1eb6734dc1f5aa72a4161f888ac",
        "reqSigs": 1,
        "type": "pubkeyhash",
        "addresses": [
          "mfsqh18UT3XjpJ8yVeiM7YX1mLxq5REG9d"
        ]
      }
    }
  ]
}
```

## 7) Signrawtransactionwithwallet

We sign the raw transaction.

```
signrawtransactionwithwallet
020000001640cbbf04aeFa24cd784c400537159ab5ab3a2a6111edc88c0d6bd89dc8210100000000ffffffffff01605af40500000001976a91403f338e0f898ef40f1eb6734dc1f5aa72a4161f888ac00000000
{
  "hex":
  "0200000001640cbbf04aeFa24cd784c400537159ab5ab3a2a6111edc88c0d6bd89dc8210100000000a473044022076d7eabc4ba8bbc6010b9cfeF002aadf6ddf47b9b18c06bc212935ef62023ea02206b3c535767aac9e33523a9079a71d46fb6ca8330cdf59901c35621b18589487012103745c9aceb84dcdddf2c3cdc1edb0b0b5af2f9bf85612d73fa6394758eae35dffffff01605af40500000001976a91403f338e0f898ef40f1eb6734dc1f5aa72a4161f888ac00000000",
  "complete": true
}
```

## 8) Decoderawtransaction

We decode the new raw transaction (the result of signrawtransactionwithwallet).  
This time the transaction has a signature in the input script (scriptSig).

```
decoderawtransaction
0200000001640cbbf04aeFa24cd784c400537159ab5ab3a2a6111edc88c0d6bd89dc8210100000000a473044022076d7eabc4ba8bbc6010b9cfeF002aadf6ddf47b9b18c06bc212935ef62023ea02206b3c535767aac9e33523a9079a71d46fb6ca8330cdf59901c35621b18589487012103745c9aceb84dcdddf2c3cdc1edb0b0b5af2f9bf85612d73fa6394758eae35dffffff01605af40500000001976a91403f338e0f898ef40f1eb6734dc1f5aa72a4161f888ac00000000
{
  "txid": "7465851cb5e90d0101524e7a6c92dea1fc566b1d1d5e4dc0d62a0138a9fb2fa2",
  "hash": "7465851cb5e90d0101524e7a6c92dea1fc566b1d1d5e4dc0d62a0138a9fb2fa2",
  "version": 2,
  "size": 191,
  "vsize": 191,
  "weight": 764,
  "locktime": 0,
  "vin": [
    {
      "txid": "21c89dd86b0d8ce8addc1e11a6a2b35aab59715300c484d74ca2ef4af0bb0c64",
      "vout": 1,
      "scriptSig": {
        "asm": "3044022076d7eabc4ba8bbc6010b9cfeF002aadf6ddf47b9b18c06bc212935ef62023ea02206b3c535767aac9e33523a9079a71d46fb6ca8330cdf59901c35621b18589487[ALL]03745c9aceb84dcdddf2c3cdc1edb0b0b5af2f9bf85612d73fa6394758eae35d",
        "hex":
        "473044022076d7eabc4ba8bbc6010b9cfeF002aadf6ddf47b9b18c06bc212935ef62023ea02206b3c535767aac9e33523a9079a71d46fb6ca8330cdf59901c35621b18589487012103745c9aceb84dcdddf2c3cdc1edb0b0b5af2f9bf85612d73fa6394758eae35d"
      },
      "sequence": 4294967295
    }
  ],
  "vout": [
    {
      "value": 0.99900000,
      "n": 0,
      "scriptPubKey": {
        "asm": "OP_DUP OP_HASH160 03f338e0f898ef40f1eb6734dc1f5aa72a4161f8 OP_EQUALVERIFY OP_CHECKSIG",
        "hex": "76a91403f338e0f898ef40f1eb6734dc1f5aa72a4161f888ac",
        "reqSigs": 1,
        "type": "pubkeyhash",
        "addresses": [
          "mfsqh18UT3XjpJ8yVeiW7YX1mLxq5REG9d"
        ]
      }
    }
  ]
}
```

## 9) Sendrawtransaction

We broadcast the signed raw transaction.

```
sendrawtransaction
020000001640cbbf04aef24cd784c400537159ab5ab3a2a6111edc88c0d6bd89dc821010000006a473044022076d7eebc4ba8bbc6010b9cfe002aadf6ddf47b9b18c06bc212935ef62023ea02206b3c53576aac9e33523a9079
a71d46fb6ca8330cdf59901c35621b18589487012103745c9aceb84dcdddf2c3cdc1edb0b05af2f9bf85612d73fa6394758eae35dfffff01605af40500000001976a91403f338e0f898ef40f1eb6734dc1f5aa72a4161f888ac
00000000
7465851cb5e90d0101524e7a6c92dea1fc566b1d1d5e4dc0d62a0138a9fb2fa2
```

Transaction ID (txid)

## 10) Getrawtransaction

We inspect the transaction using the transaction ID.

```
getrawtransaction 7465851cb5e90d0101524e7a6c92dea1fc566b1d1d5e4dc0d62a0138a9fb2fa2 true
{
  "txid": "7465851cb5e90d0101524e7a6c92dea1fc566b1d1d5e4dc0d62a0138a9fb2fa2",
  "hash": "7465851cb5e90d0101524e7a6c92dea1fc566b1d1d5e4dc0d62a0138a9fb2fa2",
  "version": 2,
  "size": 191,
  "vsize": 191,
  "weight": 764,
  "locktime": 0,
  "vin": [
    {
      "txid": "21c89dd86b0d8ce8addc1e11a6a2b35aab59715300c484d74ca2ef4af0bb0c64",
      "vout": 1,
      "scriptSig": {
        "asm": "3044022076d7eebc4ba8bbc6010b9cfe002aadf6ddf47b9b18c06bc212935ef62023ea02206b3c53576aac9e33523a9079a71d46fb6ca8330cdf59901c35621b18589487[ALL]
03745c9aceb84dcdddf2c3cdc1edb0b05af2f9bf85612d73fa6394758eae35d",
        "hex":
"473044022076d7eebc4ba8bbc6010b9cfe002aadf6ddf47b9b18c06bc212935ef62023ea02206b3c53576aac9e33523a9079a71d46fb6ca8330cdf59901c35621b18589487012103745c9aceb84dcdddf2c3cdc1edb0b05af2f9
bf85612d73fa6394758eae35d"
      },
      "sequence": 4294967295
    }
  ],
  "vout": [
    {
      "value": 0.99900000,
      "n": 0,
      "scriptPubKey": {
        "asm": "OP_DUP OP_HASH160 03f338e0f898ef40f1eb6734dc1f5aa72a4161f8 OP_EQUALVERIFY OP_CHECKSIG",
        "hex": "76a91403f338e0f898ef40f1eb6734dc1f5aa72a4161f888ac",
        "reqSigs": 1,
        "type": "pubkeyhash",
        "addresses": [
          "mfsqh18UT3XjpJ8yVeiMPYX1mLxq5REG9d"
        ]
      }
    }
  ],
  "hex":
"020000001640cbbf04aef24cd784c400537159ab5ab3a2a6111edc88c0d6bd89dc821010000006a473044022076d7eebc4ba8bbc6010b9cfe002aadf6ddf47b9b18c06bc212935ef62023ea02206b3c53576aac9e33523a907
9a71d46fb6ca8330cdf59901c35621b18589487012103745c9aceb84dcdddf2c3cdc1edb0b05af2f9bf85612d73fa6394758eae35dfffff01605af40500000001976a91403f338e0f898ef40f1eb6734dc1f5aa72a4161f888ac
00000000"
}
```