



TS+ TRADING SYSTEM

GUIDE

06/06/2022
Version 1.8.0

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1 Revision History

| Revision | Date | Author(s) | Description |
|----------|------------|-----------|---|
| 1.0.0 | 06/11/2014 | SRT | Initial revision. |
| 1.0.1 | 06/20/2014 | SRT | Some OUCH and ARCA order options are not supported. |
| 1.0.2 | 08/21/2014 | SRT | Add ISO requirement and updated Drop Copy info to be executions-only. |
| 1.0.3 | 10/03/2014 | SRT | Updated ISO section to include account and MIC. Removed IP, Port requirement. |
| 1.0.4 | 11/12/2014 | SRT | Hours of operation changed to 4am - 6:30p ET. |
| 1.0.5 | 12/19/2014 | SRT | Added quote snapshot format for ISO validation. |
| 1.1.0 | 06/17/2015 | SRT | Update ISO orders timestamp to microsecs since Epoch. |
| 1.1.1 | 06/18/2015 | SRT | Add Affirmed column to ISO orders format. |
| 1.2.0 | 09/01/2015 | SRT | Add TimeInForce column to ISO orders format. Added AMEX MIC code. |
| 1.3.0 | 11/23/2015 | SRT | Remove XPRS and add BOEv2 support. Also remove unsupported RASH protocol. |
| 1.4.0 | 01/08/2016 | SKT | Add supplemental order for cross type on OUCH. |
| 1.5.0 | 09/07/2016 | SRT | Add IEX as protected market for ISO. |
| 1.6.0 | 05/20/2018 | JMK | Add support for Pillar market. |
| 1.7.0 | 08/06/2018 | EAB | Disable ISO Orders in TS+. |
| 1.8.0 | 06/06/2022 | EAB | Change logo and company name. |

2 Overview

Lime TS+ Trading System is a TCP proxy application that performs complete in-line pre-trade risk and SEC 15c3-5 regulatory checks. Orders that fail validation are rejected and are never forwarded to the market. The client will be integrating directly using the native market protocols with Lime TS+ instead of Lime API or FIX interface. The state of the art design offers an ultra-low latency access to all major US Equities exchanges with an expanded support for order options and other features that the exchanges have to offer.

The primary purpose of this document is to highlight the differences between market functionality and what Lime TS+ trading system offers.

3 Integration Considerations

3.1 Protocol Support

The Lime TS+ Trading System provides support for binary market protocols only at this time. Though support for FIX protocols is possible, Lime currently has no plans to offer this via this product. Please note that the client will have access to all markets via the Lime TS Trading System. Please refer to Lime FIX manual or API specification for more details.

3.2 Supported Domains

Only US Equities trading is supported at this time.

3.3 Supported Markets

The Lime Trading Corp TS+ trading system will support the following exchanges.

- NYSE
- ARCA
- Nasdaq
- Nasdaq BX
- Nasdaq PSX
- BATS BYX
- BATS BZX
- DirectEdge EDGA

- DirectEdge EDGX
- Pillar

3.4 ACS API

All queries for TS+ information are supported via the ACS API except the route query. Please refer to our ACS API specifications in Client Download site for more details.

3.5 Portal

Portal will provide only view-only support for TS+. Portal users will not be able to place new orders and/or replace/cancel open TS+ orders. The client can request a Lime TS account if manual order entry and/or trade out functionality is desired.

3.6 Drop Copy

Drop Copy is fully supported.

3.7 Resend Behavior

Messages resent to the client during resend request processing will not include any rejects that were generated by the Lime TS+ Trading System. The client is advised to handle this in their application by either resubmitting any unacknowledged orders, removing, or simply ignoring them after the resend is complete.

3.8 Away Trading Notification

Lime Trading Corp is in the process of implementing support for clients to notify Lime of their away trading activity in real-time for inclusion in financial risk checks. Clients will need to code to Lime Away Drop Specification for providing this information. Please refer to the Client Download site for more details (Available soon!).

3.9 Hours of Operation

Lime Trading Corp regular trading hours are from 4:00 to 18:30 (4 AM to 6:30 PM) ET. The servers do not allow for overnight connections, and Lime Trading Corp will disconnect all client sessions at some point after 18:30. Login may begin anytime after 3:50 AM.

3.10 Certification

Lime Trading Corp highly encourages the client to thoroughly test their application by connecting to Lime test environment prior to production. The Lime test environment will have access to all the market UAT environments. At the completion of testing, the client

is required to contact Lime Technical Support (TS) group to schedule certification. A support person will then be assigned to the client for the certification process.

Please contact Lime TS at (212) 824-5515 or TS@lime.co

4 US Equities Markets

4.1 NYSE

4.1.1 Login Details

Lime will provide the following information for clients to login and trade on a given NYSE market session.

- IPv4 address of TS+ server for connection establishment
- TCP port for connection establishment
- UTPDirect Username for login
- UTPDirect OnBehalfOfCompID value for orders

For eg.,

Connection: 10.10.10.10:10004

Username: XNYS1

OnBehalfOfCompID: LXX

4.1.2 Special Considerations: UTPDirect

| Field | Comment |
|---------|--|
| Account | If provided on new order then the value would be included in tag 9050 of executions provided via drop copy |

4.1.3 Exceptions

Permitted values are restricted for the following fields.

| Field | Permitted Values |
|----------------------|------------------------|
| Side | '1' Buy |
| | '2' Sell |
| | '3' Buy Minus |
| | '4' Sell Plus |
| | '5' Sell Short |
| Order Type | '1' Market |
| | '2' Limit |
| | '3' Stop |
| | '5' Market On Close |
| | 'B' Limit On Close |
| Order Capacity | 'A' Agency |
| | 'P' Principal |
| | 'R' Riskless Principal |
| Exec Instructions | 'M' Mid-Point Peg |
| Routing Instructions | 'A' ALO |
| | '7' NX |
| | 'D' DNS |
| | 'S' SOC |
| | 'I' ISO |
| | 'C' CO |
| | 'R' RPI |
| | '1' RTO |
| | '2' RTNR |
| | '3' RTR |

4.2 ARCA

4.2.1 Supported Protocol

ArcaDirect 4.1

4.2.2 Login Details

Lime will provide the following information for clients to login and trade on a given ARCA market session.

- IPv4 address of TS+ server for connection establishment
- TCP port for connection establishment

- ArcaDirect username for login
- ArcaDirect CompanyGroupId value for orders

For eg.,

Connection: 10.10.10.10:10004

Username: A0001

CompanyGroupId: WALLE

4.2.3 Special Considerations: ArcaDirect

| Field | Comment |
|---------|--|
| Account | If provided on new order then the value would be included in tag 9050 of executions provided via drop copy |

4.2.4 Exceptions

- The following features are not supported.
 - Bulk Cancel
 - Fast Cancel Replace
- Permitted values are restricted for the following fields.

| Field | Permitted Values |
|------------|------------------|
| Side | '1' Buy |
| | '2' Sell |
| | '5' Sell Short |
| Order Type | '1' Market |
| | '2' Limit |
| | '7' Inside Limit |
| | 'P' Peg |

Continued on next page

| Field | Permitted Values |
|---------------------------------|------------------------|
| Rule80A | 'A' Agency |
| | 'P' Principal |
| | 'R' Riskless Principal |
| Exec Instructions | '5' Passive Liquidity |
| | 'M' Mid-Point Peg |
| | 'P' Market Peg |
| | 'R' Primary Peg |
| Extended Exec In- structions | 'A' |
| | 'P' |

- The following combination of order options are not supported.
 - MaxFloor and ProactiveDisplayIndicator = 1 (Reserve and Random order)

4.3 Nasdaq (INET, BX, PSX)

4.3.1 Supported Protocols

Ouch 4.2 (INET)

Ouch 4.2 (BX)

Ouch 4.2 (PSX)

RASHport 1.1 (INET)

RASHport 1.1 (BX)

RASHport 1.1 (PSX)

4.3.2 Login Details

Only OUCH is supported at this time but RASH can be supported upon request. Lime will provide the following information for clients to login and trade on a given OUCH market session.

- IPv4 address of TS+ server for connection establishment
- TCP port for connection establishment
- OUCH username for login
- OUCH password for login

- OUCH Firm on orders must be blank-filled

For eg.,

Connection: 10.10.10.10:10004

Username: OUCH1

Password: OUCH

4.3.3 Special Considerations: Ouch

| Field | Comment |
|---------|---|
| OrderID | If provided on new order then the value would be included in tag 9050 of executions provided via drop copy (embed Account in order token, eg: <account>-<order id>) |

4.3.4 OUCH Exceptions

- Modify order request is not supported.
- Permitted values are restricted for the following fields.

| Field | Permitted Values |
|--------------------|------------------------|
| Buy Sell Indicator | 'B' Buy |
| | 'S' Sell |
| | 'T' Sell Short |
| Capacity | 'A' Agency |
| | 'P' Principal |
| | 'R' Riskless Principal |

Continued on next page

| Field | Permitted Values |
|--------------|-----------------------------------|
| Display Type | 'A' Attributable Price To Display |
| | 'Y' Anonymous Price To Comply |
| | 'N' Non-Display |
| | 'P' Post-Only |
| | 'I' Imbalance-Only |
| | 'M' Mid-Point Peg |
| | 'W' Mid-Point Peg Post-Only |
| | 'L' Post-Only and Attributable |
| | 'O' Retail Order Type 1 |
| | 'T' Retail Order Type 2 |
| | 'Q' Retail Price Improvement |
| Cross Type | 'N' Continuous |
| | 'O' Opening |
| | 'C' Closing |
| | 'S' Supplemental |
| | 'R' Retail |

4.4 BATS (BZX and BYX) and DirectEdge (EDGA and EDGX)

4.4.1 Supported Protocols

BATS BZX Order Entry 1.8.13 (August 21, 2015)

BATS BYX Order Entry 1.9.13 (August 21, 2015)

BATS US Equities BOE Specification v2 2.1.7 (October 26, 2015)

4.4.2 Login Details

Lime will provide the following information for clients to login and trade on a given BOE market session.

- IPv4 address of TS+ server for connection establishment
- TCP port for connection establishment
- BOE username for login
- BOE password for login

For eg.,

Connection: 10.10.10.10:10004

Username: B001

Password: BATSZ

4.4.3 Special Considerations: BATS Order Entry

| Field | Comment |
|---------|--|
| Account | If provided on new order then the value would be included in tag 9050 of executions provided via drop copy |

4.4.4 Exceptions

Permitted values are restricted for the following fields.

| Field | Permitted Values |
|----------------|------------------------|
| Side | '1' Buy |
| | '2' Sell |
| | '5' Sell Short |
| Order Capacity | 'A' Agency |
| | 'P' Principal |
| | 'R' Riskless Principal |

A Exchange Market Identifier Codes (MIC)

| Market | ISO-10383 MIC |
|------------------------------|---------------|
| NYSE | XNYS |
| NYSE ARCA | ARCX |
| NYSE MKT (AMEX) | XASE |
| Nasdaq | XNAS |
| Nasdaq OMX BX | XBOS |
| Nasdaq OMX PSX | XPHL |
| BATS BZX | BATS |
| BATS BYX | BATY |
| Chicago Board Stock Exchange | CBSX |
| Chicago Stock Exchange | XCHI |
| DirectEdge EDGA | EDGA |
| DirectEdge EDGX | EDGX |
| National Stock Exchange | XCIS |
| Investors Exchange (IEX) | IEXG |