



Specifications for Connecting to FLEX Historical Service

Version 3.1.3

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JPX Market Innovation & Research, Inc.

Contents

1. Purpose of these specifications	1
2. Outline of DFS.....	1
2.1. File provision method	1
2.2. Communication line	1
2.3. Telecommunications equipment.....	1
2.4. Configuration information	2
3. Outline of provided information	3
3.1. Information to be provided.....	3
3.2. Outline of files to be provided.....	5
3.3. Provision format.....	8
3.4. DFS operating hours and timing of file updates.....	9
3.5. Handling of archived data	9
3.6. Notes on downloading	10
4. Operations during system failure.....	11
4.1. During system failure	11
4.2. Errors in information	11
5. Contact	12
6. Revision	12

1. Purpose of these specifications

These specifications are intended for users of the FLEX Historical service provided by JPX Market Innovation & Research, Inc. (hereinafter referred to as "JPXI") and contain the information necessary for connecting user systems to JPXI's Data Feed Server (hereinafter referred to as "DFS").

For details on FLEX formats, items on record, and other matters of the FLEX Historical service, please refer to the connection specifications for each information classification and service as Table 2.

2. Outline of DFS

Information provision under DFS is conducted through a cloud service.

2.1. File provision method

(1) Regular service -Information provision through API

For regular service, information is provided through API. Please note that only data from the last 30 days is available for acquisition through API.

For the detailed procedure for acquiring data, please refer to “(separate document 1) API data acquisition manual”.

In addition, the API specifications based on separate document 1 have been released, so please refer to the URL below.

<http://apidoc-flex.jpx-datasevice.com/>

(2) All-period data service and Spot data service -Information provision through S3 link

For all-period data service and spot data service, data is transferred by data linkage between JPXI-side S3 and user-side S3, both of which are provided by the Amazon Web Service (hereinafter referred to as "AWS"). All-period data service provides data from January 4, 2011. Spot data service provides data for the period specified by the user.

For the detailed procedure for acquiring data, please refer to “(separate document 2) S3 data acquisition manual”.

2.2. Communication line

The Internet is used as the communication line.

2.3. Telecommunications equipment

Since the user connects to the cloud service via the Internet, an environment with Internet access is required. All-period data service and Spot data service users will need to set up their AWS environment as described in 2.1.(2).

2.4. Configuration information

The following information necessary for connection to the Regular service will be provided to users in the "Configuration Sheet" prepared by JPXI.

Item
Available period
Contract service
User ID/Password
Service domain

3. Outline of provided information

3.1. Information to be provided

The PCAP files to be provided under DFS are created for each multicast group.

The multicast groups are as indicated in Table 1. Users are granted access permissions based on the service users are subscribing and will be able to access only the PCAP files users have access permissions to.)

For data prior to May 21st, 2021, please refer to 3.5.

Table 1 Multicast group applicable for provision

NO	Name of FLEX Service	Information Classification	Multicast Group	FLEX Historical Service Classification
1	FLEX Standard(WB)	TSE real-time (Stock/CB)	001	FLEX Standard Historical
2	FLEX Standard(WB)	TSE real-time (Stock/CB)	002	
3	FLEX Standard(WB)	TSE real-time (Stock/CB)	003	
4	FLEX Standard(WB)	TSE real-time (Stock/CB)	004	
5	FLEX Standard(WB)	TSE real-time (Stock/CB)	005	
6	FLEX Standard(WB)	TSE real-time (Stock/CB)	006	
7	FLEX Standard(WB)	TSE real-time (Stock/CB)	007	
8	FLEX Standard(WB)	TSE real-time (Stock/CB)	008	
9	FLEX Standard(WB)	TSE real-time (Stock/CB)	009	
10	FLEX Standard(WB)	TSE real-time (Stock/CB)	010	
11	FLEX Standard(WB)	TSE real-time (Stock/CB)	011	
12	FLEX Standard(WB)	TSE real-time (Stock/CB)	012	
13	FLEX Standard(WB)	TSE real-time (Stock/CB)	013	
14	FLEX Standard(WB)	TSE real-time (Stock/CB)	014	
15	FLEX Standard(WB)	TSE real-time (Stock/CB)	015	
16	FLEX Standard(WB)	TSE real-time (Stock/CB)	016	
17	FLEX Standard(WB)	TSE real-time (Stock/CB)	107	
18	FLEX Standard(WB)	TSE real-time (Stock/CB)	018	
19	FLEX Standard(WB)	TSE real-time (Stock/CB)	021	FLEX Standard Historical FLEX Full Historical ToSTNeT Historical
20	FLEX Standard(WB)	NSE real-time (Stock/CB)	022	Not applicable
21	FLEX Standard(WB)	NSE base price (Stock/CB)	023	

NO	Name of FLEX Service	Information Classification	Multicast Group	FLEX Historical Service Classification
22	FLEX Standard(WB)	FSE real-time (Stock)	024	
23	FLEX Standard(WB)	FSE base price (Stock)	025	
24	FLEX Standard(WB)	SSE real-time (Stock)	026	
25	FLEX Standard(WB)	SSE base price (Stock)	027	
26	FLEX Standard(WB)	TSE issue information (Stock/CB)	032	FLEX Standard Historical FLEX Full Historical ToSTNeT Historical
27	FLEX Standard(WB)	TSE issue information (Stock)	033	Not applicable
28	FLEX Standard(WB)	TSE issue information (Stock)	034	
29	FLEX Standard(WB)	TSE issue information (Stock)	035	
30	FLEX Standard(WB)	Multicast group number	040	FLEX Standard Historical
31	FLEX Standard(WB)	TSE real-time (ToSTNeT)	041	ToSTNeT Historical
32	FLEX Standard(WB)	TSE (Index/Statistics)	042	FLEX Standard Historical
33	FLEX High-speed Index	TSE High-speed Index (TOPIX)	046	Real-time TOPIX Historical
34	FLEX High-speed Index	TSE High-speed Index (TOPIX Core 30)	047	
35	FLEX High-speed Index	TSE High-speed Index (TOPIX500)	048	
36	FLEX Standard(WB)	TSE real-time (Dummy Symbols)	101	Not applicable
37	FLEX Standard(WB)	TSE base price (Dummy Symbols)	102	
38	FLEX Standard(WB)	Multicast group number (Dummy Symbols)	110	
39	FLEX Full(WB)	TSE real-time (Stock/CB)	051	FLEX Full Historical
40	FLEX Full(WB)	TSE real-time (Stock/CB)	052	
41	FLEX Full(WB)	TSE real-time (Stock/CB)	053	
42	FLEX Full(WB)	TSE real-time (Stock/CB)	054	
43	FLEX Full(WB)	TSE real-time (Stock/CB)	055	

NO	Name of FLEX Service	Information Classification	Multicast Group	FLEX Historical Service Classification	
44	FLEX Full(WB)	TSE real-time (Stock/CB)	056		
45	FLEX Full(WB)	TSE real-time (Stock/CB)	057		
46	FLEX Full(WB)	TSE real-time (Stock/CB)	058		
47	FLEX Full(WB)	TSE real-time (Stock/CB)	059		
48	FLEX Full(WB)	TSE real-time (Stock/CB)	060		
49	FLEX Full(WB)	TSE real-time (Stock/CB)	061		
50	FLEX Full(WB)	TSE real-time (Stock/CB)	062		
51	FLEX Full(WB)	TSE real-time (Stock/CB)	063		
52	FLEX Full(WB)	TSE real-time (Stock/CB)	064		
53	FLEX Full(WB)	TSE real-time (Stock/CB)	065		
54	FLEX Full(WB)	TSE real-time (Stock/CB)	066		
55	FLEX Full(WB)	TSE real-time (Stock/CB)	067		
56	FLEX Full(WB)	TSE real-time (Stock/CB)	068		
57	FLEX Full(WB)	NSE real-time (Stock/CB)	072		Not applicable
58	FLEX Full(WB)	FSE real-time (Stock)	074		
59	FLEX Full(WB)	SSE real-time (Stock)	076		
60	FLEX Full(WB)	Multicast group number	090	FLEX Full Historical	
61	FLEX Full(WB)	TSE real-time (Dummy Symbols)	111	Not applicable	
62	FLEX Full(WB)	Multicast group number (Dummy Symbols)	120		

3.2. Outline of files to be provided

(1) File format

The files will be provided in PCAP format and will contain the headers indicated in (a), such as the timestamp of the captured packet, attached to FLEX (WB) data distributed by the Market Information System.

(a) PCAP file format

PCAP file headers for each file and PCAP packet headers for each packet will be added in the PCAP files.

The PCAP file structure is as shown in Fig. 1.

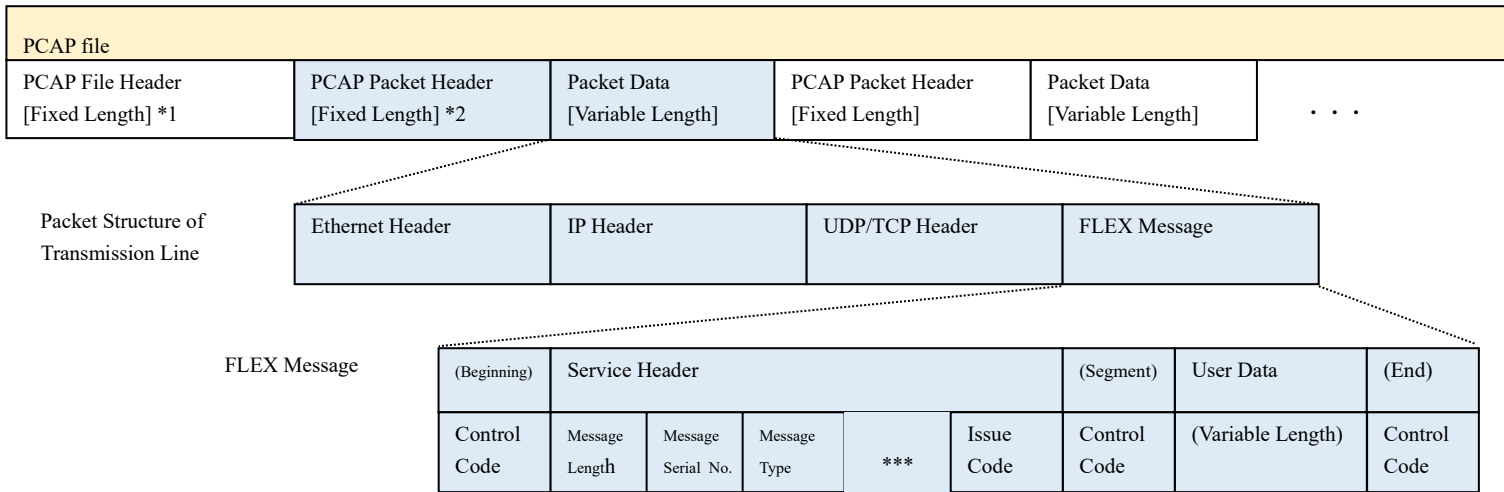


Fig. 1 PCAP File Structure

*1 PCAP File Header.... 24 bytes

0	1	2	3	4	5	6	7
magic [4 bytes]				version_major [2 bytes]		version_minor [2 bytes]	
Set Value (Fixed): 0xA1B23C4D				Set Value (Fixed): 0x0002		Set Value (Fixed): 0x0004	
thiszone [4 bytes]				sigsigs [4 bytes]			
Set Value (Fixed): 0x00000000				Set Value (Fixed): 0x00000000			
snaplen [4 bytes]				linktype [4 bytes]			
Set Value (Fixed): 0x00040000				Set Value (Fixed): 0x00000001			

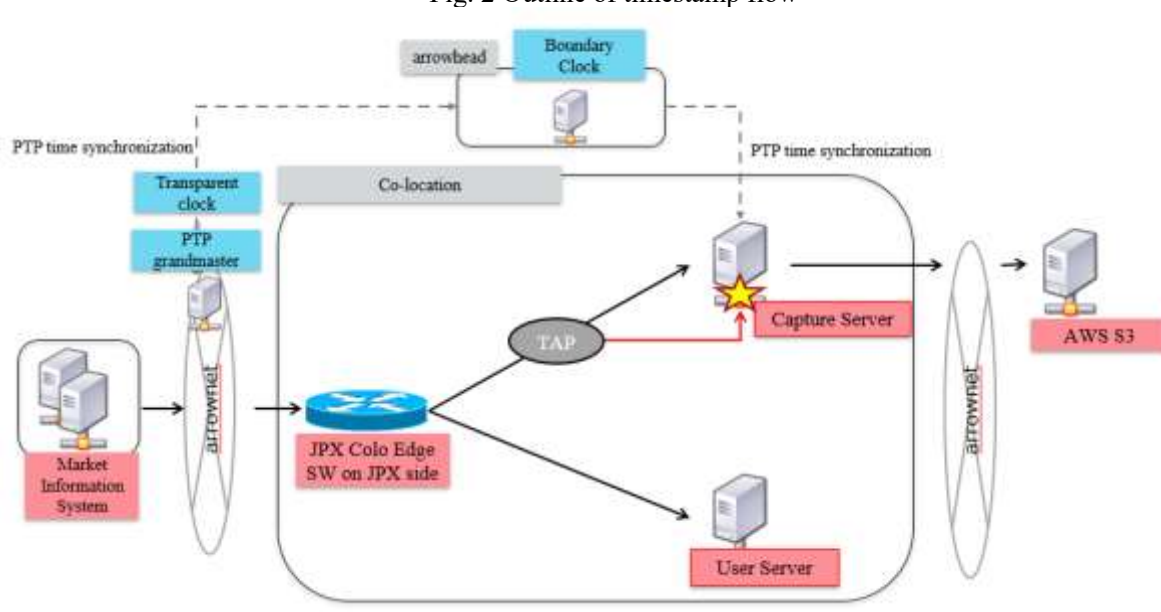
*2 PCAP Packet Header16 bytes

0	1	2	3	4	5	6	7
ts [8Byte]							
(Second: 4 bytes)				(Nanosecond: 4 bytes)			
Set Value: Time of receiving packet							
caplen [4 bytes]				len [4 bytes]			
Set Value: Set according to received packet				Set Value: Set according to received packet			

The time indicated in the PCAP packet header will be the time when packets captured by

the TAP after having passed the JPX co-location edge SW on JPX side reach the capture server. The timestamp is provided by the FPGA hardware clock implemented in the capture server and is synchronized with the PTP boundary clock of arrowhead based on the Precision Time Protocol (PTP). Although the timestamp is recorded in nanoseconds, there might be discrepancies in the timestamps due to the processing time for the timestamp in the FPGA and the accuracy of PTP synchronization.

Fig. 2 Outline of timestamp flow



(2) Format of FLEX messages

For FLEX message formats, please see the connection specifications for each information classification and service indicated in Table 2. The documents contain the detailed formats of the FLEX messages indicated in Fig. 1.

Table 2. Connection specifications for each information classification and service (Reference documents for FLEX message formats)

Information Classification	Name of Service	Connection Specifications
TSE real-time (Stock/CB)	FLEX Standard	Market Information System FLEX Connection Specification Real-time Message (Standard)
TSE base price (Stock/CB)	FLEX Standard	Market Information System FLEX Connection Specification Issue Basic Information
TSE issue information (Stock/CB)	FLEX Standard	Market Information System FLEX Connection Specification Issue Basic Information
Multicast group number	FLEX Standard	Market Information System FLEX Connection Specification Issue Basic Information
TSE real-time (ToSTNeT)	FLEX Standard	Market Information System FLEX Connection Specification ToSTNeT
TSE (Index/Statistics)	FLEX Standard	Market Information System FLEX Connection Specification Index/Statistics Group
TSE High-speed Index (TOPIX)	FLEX High-speed Index	Market Information System FLEX Connection Specification High-speed Index

Information Classification	Name of Service	Connection Specifications
TSE High-speed Index (TOPIX Core 30)	FLEX High-speed Index	Market Information System FLEX Connection Specification High-speed Index
TSE High-speed Index (TOPIX 500)	FLEX High-speed Index	Market Information System FLEX Connection Specification High-speed Index
TSE real-time (Stock/CB)	FLEX Full	Market Information System FLEX Connection Specification Real-time Message (Full)
Multicast group number	FLEX Full	Market Information System FLEX Connection Specification Issue Basis Information

(2) Character code

In principle, files use JIS8 code for 1-byte/alphanumeric characters and Shift-JIS code for 2-byte characters. Some records also include ASCII characters for control code. For details, please refer to the file specifications.

3.3. Provision format

FLEX messages (Standard, Full, and High-Speed Index) for each multicast group described in 3.1 and each FLEX line are recorded in PCAP format and are provided in compression file format (gzip). The outline of provided data is as shown in Table 3.

Table 3. Outline of provided data

項番	PCAP ファイル名 Name of PCAP File	物理ファイル名 (圧縮ファイル) (※1) Name of Physical File (Compressed File) (*1)	圧縮形式 Compression Format	物理ファイル名 (解凍後ファイル) (※1) Name of Physical File (Decompressed File)(*1)
1	FLEX1 系 PCAP ファイル FLEX1 Line PCAP File	YYYYMMDD_1_NNN.pcap p.gz	gzip 形式 gzip format	YYYYMMDD_1_NNN.pcap
2	FLEX2 系 PCAP ファイル FLEX2 Line PCAP File	YYYYMMDD_2_NNN.pcap p.gz	gzip 形式 gzip format	YYYYMMDD_2_NNN.pcap

*1 Structure of physical file name (Compressed file: (1)_(2)_(3).pcap.gz)

(1): YYYYMMDD...System date for creating the PCAP file

(2): 1 or 2...Recorded FLEX line number

(3): NNN.... Recorded multicast group number

3.4. DFS operating hours and timing of file updates

(1) DFS operating hours

This service is available 24 hours a day, 365 days a year in principle.

However, the service may be interrupted due to system maintenance during the night or on non-business days. In such cases, JPXI will send a prior notice by e-mail to notify users of the service suspension.

(2) Timing of file updates

Files will be updated at 23:00 on every business day.

3.5. Handling of archived data

(1) File format

For data prior to May 21, 2021, FLEX (WB) data, which was previously provided, is provided in compressed file format (gzip) instead of PCAP format. Please refer to the "(Appendix XX) Stored Contents List", in which the contents included in each file are listed based on the record service header.

Please note that there are some exceptions for provided data. Please see Table 4 for the exceptions.

Table 4 Exception List for Provided Data

Data Storage Period / Contents (Exceptions)	
1	High-Speed Index data is available from February 28, 2011.
2	Data storage period of files for FLEX Standard (Futures), Master File (Futures), and FLEX Standard (Futures/Evening Session) are up to November 18, 2011. (Data beginning on November 21, 2011 is not available.)
3	Issue Type Code 06 (Futures) is excluded from ToSTNeT beginning November 21, 2011.
4	Due to system issues, information for the below multicast groups is not available for the morning auction session of February 2, 2012: FLEX Standard: 010, 015, 022 FLEX Full: 053, 058, 065, 072, 079 *Please see "(Attachment 2) Notes on Archived Data.xls" for a list of the issues affected.
5	Indicative NAV and index data are available from December 15, 2014. FLEX Standard:

	<ul style="list-style-type: none"> - Multicast group: 039 (Indicative NAV), 049 (Index) - Message classification: 300 <p>*For multicast group 039 (Indicative NAV), data storage period is up to March 31, 2017. (Data beginning on April 3, 2017 is not available.)</p>
6	Message serial number of each product is changed as described in "(Attachment 1) Stored Contents List" from September 24, 2015.

Data for the period from Jan. 4, 2010 to Dec. 30, 2010 is available as reference information, but please be aware that some files and data during this period are unavailable due to certain circumstances. Please refer to "(Attachment 2) Notes on Archived Data" for details.

3.6. Notes on downloading

(1) Order of records

Please be aware that in some cases the order of the data records may be different from the order in which the data is generated.

For example, in some cases the data record may appear as follows due to system limitations:

- FLEX messages generated at 10:00:00 are recorded before FLEX messages generated at 9:59:59.

(2) Data transfer rate limit (download)

There is no limit to the data transfer rate for downloading files.

4. Operations during system failure

4.1. During system failure

JPXI will inform users via e-mail should a system failure occur in the DFS.

Users will be notified of system recovery via e-mail.

Please try downloading the file after system recovery.

Depending on the failure, system recovery could be on or after the business day following the day of the system failure. In addition, file provision could be via either only a FLEX1 line PCAP file or FLEX2 line PCAP file, or an alternative file in such a file format as described in 3.5(1).

4.2. Errors in information

If the provided information contains errors and/or lost packets, JPXI may not be able to reproduce the correct files in some cases due to system limitations. In such cases, JPXI will inform users of the occurrence and correct information by e-mail and/or other means as well as update the "(Attachment 2) Notes on Archived Data".

When packet is lost in the range of the same message serial number of the FLEX1 line PCAP file and FLEX2 line PCAP file, an alternative file in non-PCAP format may be provided.

5. Contact

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6. Revision

Date	Version	Details
January 11, 2011	1.0	First edition
January 24, 2011	1.1	
August 22, 2011	1.2	Change in the description of provided files due to the launch of Tdex+.
December 26, 2011	1.3	Changed content regarding FLEX Standard, Master File and FLEX Standard (evening session) relating to futures.
February 3, 2012	1.4	Attachment 2: revised list of "Notes on Archived Data" Revised list of exceptions for data provision
July 18, 2012	1.4.1	Attachment 2: revised list of "Notes on Archived Data".
April 9, 2013	1.5	3.4 DFS operation time and file update time (3) Retrieval of Archived Data (b) Directory Structure Following item has been changed. (Old) Data for past 20 days including current day (New) Data for past 10 days including current day
September 30, 2013	1.6	2.4 Configuration information Following FTP ports have been changed. (Old) 10020, 10021 (New) 20, 21 2.5 Notes on connecting through the Internet Following Hostname has been changed. (Old) ftp2.tmi.tse.or.jp (New) ftp.tmi.tse.or.jp
December 15, 2014	1.7	3.4 DFS operating time and file update time (3) Retrieval of Archived Data (a) Data Storage Period Item No.5 is added to "Exception List." Attachment 1 Indicative NAV and Index data is added to "Cash equities (Standard)."

September 24, 2015	1.8	<p>3.4 DFS operating time and file update time (3) Retrieval of Archived Data (a) Data Storage Period Item No.6 is added to "Exception List."</p> <p>Attachment 1 Message number of each product is changed as described in "(Attachment 1) Stored Contents List" from September 24, 2015.</p>
October 13, 2015	1.9	<p>Attachment 2 No.70 and No.71 are added to "Notes on Archived Data".</p>
March 21, 2016	2.0	<p>3.4 DFS operating time and file update time (3) Retrieval of Archived Data (b) Directory Structure Note regarding "itch" directory is added.</p> <p>Attachment 2 No.72 to No.77 are added to "Notes on Archived Data".</p>
May 17, 2017	2.1	<p>3.4 DFS operating time and file update time (3) Retrieval of Archived Data (a) Data Storage Period On "Exception List", note regarding "Indicative NAV" is added.</p> <p>(4) Notes on downloading "(c) Data Transfer Rate Limit (Download)" is added.</p> <p>Attachment 2 No.78 to No.86 are added to "Notes on Archived Data".</p>
August 2, 2017	2.1.1	<p>3.4 DFS operating time and file update time (4) Notes on downloading (c) Data Transfer Rate Limit (Download) Note regarding "data transfer" is added.</p>
May 31, 2019	2.1.2	<p>3.3. File specification location "Standard_Light_J_YYYYMMDD" and "Standard_Light_E_YYYYMMDD" are stored before version 14.9 in each (Japanese/English) directory.</p> <p>■ Attachment 1 Applicable period: From 2015/9/24 • Product: Cash equities (Standard)</p>

		<p>Segment code: Added 01、 02</p> <p>Notes: Added notes “Due to the stop of Indicative NAV distribution, message number 043 is not provided since April 1st, 2017.”</p> <ul style="list-style-type: none"> • Product: Cash equities (Full) Deleted segment code 01、 02. • Product: CB (Full) Deleted segment code 01、 02. • Cash equities CB/ Base price Deleted notes "Does not include control tags (beginning/end)." • Cash equities CB/ Constituent master Deleted notes "Does not include control tags (beginning/end)." • Added Message Types which are not stored below the table. <p>Applicable from 2011/1/4 to 2015/9/23</p> <ul style="list-style-type: none"> • Product: Cash equities (Standard) Improved notes as follows: (Before) Indicative NAV and index / (After) In terms of Indicative NAV (Message number 039) and index (Message number 049) / • Product: Cash equities (Full) Deleted segment code 01、 02. • Product: CB (Full) Deleted segment code 01、 02. • Product: Cash equities CB/Base price Deleted notes "Does not include control tags (beginning/end)." • Product: Cash equities CB/Constituent master Deleted notes "Does not include control tags (beginning/end)." • Added Message Types which are not stored below the table.
November 10, 2020	2.1.3	Attachment 2 No.90 to No.91 are added to "Notes on Archived Data".
March 24, 2021	3.1.1	Change in all chapters due to service expansion
May 20, 2021	3.1.2	2.4.Configuration information Added Item in the "Configuration Sheet"

		<p>3.1. Information to be provided FLEX FULL (WB) Revised Table 1</p> <p>3.5. Handling of archived data Revised the target period from "May 28" to "May 21"</p>
April 4,2022	3.1.3	<p>Correct as following</p> <p>1. Purpose of these specifications</p> <ul style="list-style-type: none"> • TOKYO STOCK EXCHANGE to JPX Market Innovation & Research • TSE to JPXI <p>2.4. Configuration information</p> <ul style="list-style-type: none"> • TOKYO STOCK EXCHANGE to JPX Market Innovation & Research <p>3. Outline of provided information</p> <p>3.1. Information to be provided</p> <p>Table 1 Multicast group applicable for provision</p> <ul style="list-style-type: none"> • FLEX Historical Service Classification <p>Added "ToSTNeT Historical" to No19 and 26.</p> <p>5. Contact</p> <p>Tokyo Stock Exchange, Inc. Information Services Department to JPX Market Innovation & Research, Inc. Client Service Department.</p>
April 4,2022		<p>(Separate document 1) API data acquisition manual.pptx</p> <ul style="list-style-type: none"> • Corrected the characters in the command example to the characters that can be used in the command.