

Dow Jonessm Indices Specification

Version 3
April 2004

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1.00 Preface

1.01 Scope of Specification

This Specification describes the communications interface, message formats, and conventions for the transmission of price and other data from the index provider to vendors in a computer readable format emphasizing data integrity and error recovery capability. The messages defined herein are not intended for viewing by end users without computer processing. Vendors (and other subscribers, hereafter included in the term vendors) may develop their systems to read the index provider lines with primary reference to this Specification.

1.02 Inter-Exchange Technical Committee

This Specification was created using message concepts developed under the auspices of the Inter-Exchange Technical Committee (ITC). The ITC is an informal committee of technical representatives of commodity exchanges meeting on an as-needed basis.

The Current officers of the Committee are:

Chairman:

Michael Boyle

Chicago Board of Trade

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1.03 Information providers

Information Providers, or their designated processors, which have implemented this Specification, or which anticipate implementing this Specification, are listed below:

<u>Exchange / Information provider</u>	<u>Actual Date of Implementation</u>
Chicago Board of Trade / Dow Jones sm	August 1997 (initial implementation) June 2004 (Version 3)
SIAC	June 2002

1.04 Vendors

Actual and prospective subscribers (direct or indirect) who must be able to interpret lines conforming to this Specification are invited to comment thereon. Comments may be supplied at vendor meetings

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called from time to time by the Inter-Exchange Technical Committee or by contacting Committee officers directly by mail or telephone.

1.05 Specification Updates

Vendors and correspondents may obtain a copy of this specification and by contacting:

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1.06 Organization of Specification

The body of this document describes the common elements of the communications interface between Exchanges/Information Providers and vendors. No exchange/information provider system will be regarded as conforming to this Specification which is inconsistent with any provision contained in the body of this Specification; however, it is not contemplated that each exchange/information provider will at all times implement each aspect of the Specification, nor is it contemplated that aspects of exchange/information provider implementation which are not described within the body of this Specification will be common among exchanges/information providers.

For example, the definition of message formats and identifying codes are established in the body of this Specification. No exchange/information provider will use a message format not identified in this Specification, nor will it use codes inconsistent with those identified in this specification. However, an exchange/information provider may not implement certain message formats or types identified in the body of this Specification. Conversely, the communications interface is not defined in the body of this Specification and is not expected to be common among implementing exchanges/information providers. The particulars of each exchange/information provider's implementation of this Specification are contained in the appendices.

Appendices will be numbered, to the extent possible, with reference to the overlying paragraphs of the body of this Specification.

2.00 Communications Interface

Multicast based network, with a specific multicast group for the Dow Jones indices (production and TEST feeds available).

Radianz provided terminations at Vendor's site

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3.01 Character Set

All transmissions will be in USASCII, unmodified. Each character will consist of seven (7) data bits, plus an eighth (8th) bit for parity (vertical redundancy check) which must be used by each exchange/information provider.

The standard ASCII character set will be utilized with the following limitations:

<u>Synchronous protocols</u>	<u>Asynchronous protocols</u>
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Only the following control characters will be utilized:

SOH
STX
ETX
SYN
US

Only the following control characters will be utilized:

CR

SOH
STX
ETX

Lower case characters, though permitted, will be avoided; no lower case characters will be used for Contract ID codes, Option ID codes or BAT codes

Lower case characters, though permitted, will be avoided; no lower case characters will be used for Contract ID codes, Option ID codes or BAT codes

DEL will not be utilized

DEL will not be utilized

Note that while the foregoing character set limitations are deemed appropriate for the present, certain exchange/information providers' implementation of this Specification may require the utilization of other control characters or the DEL character; in which case, the foregoing limitations would be relaxed.

3.02 "P/A Characters" Defined, Justified and Filled

"P/A Characters" Defined, Justified and Filled Printable ASCII characters including ASCII space will be used for codes within this Specification and will be referred to hereafter as "P/A Characters". All fields containing P/A Characters will be left justified and ASCII space character filled as appropriate.

3.03 "C/A Characters" Defined, Justified and Filled

Capital alpha characters will be defined as the capital letters A through Z as well as ASCII space. Index Symbol, Global Index Descriptions may not begin with a space, but may end with multiple spaces.

3.04 Numeric Characters Defined, Justified and Filled

Numeric Characters, Defined, Justified and Filled Numeric characters are defined as the numerals, 0 through 9, as well as ASCII space.

Fields containing numeric characters will be right justified and ASCII zero (0) filled as appropriate.

If there is no data available to fill a numeric field (as contrasted with the case where the appropriate value for the field is zero), then the field will be filled with ASCII space characters. Numeric fields subject to ASCII space character fill will be identified where appropriate.

3.05 Retransmission

Each exchange/information provider system will log every message sent, except that retransmissions of previously sent messages, Refresh Messages and Line Integrity Verification control messages will not be logged or available for retransmission. This log will provide a limited facility for message retransmission on the same day.

A vendor may request retransmission of a single message or a group of sequentially numbered messages by placing a telephone call to the exchange/information provider control center. The Vendor must specify the first and last Message Sequence Number in the sequence to be retransmitted.

The Vendor Identification field in the message header associated with each message retransmitted will contain two (2) Characters, which identify the vendor requesting the retransmission. Retransmitted messages will be sent to all participants. If more than one (1) vendor requests retransmission of the same messages, or where the exchange/information provider believes that more than one (1) vendor may have missed the same messages, one (1) retransmission of the same messages will be addressed to "All Vendors" under Vendor ID "AV". Each vendor should process retransmissions addressed to Vendor ID "AV" whether or not such messages are requested.

In synchronous protocols with multiple message blocking, there will be no mixing of retransmission messages with current messages in any multiple message block.

Messages retrieved for retransmission will be transmitted on a low priority basis so as not to interfere with or significantly delay transmission of current messages.

The Message sequence Number field in the Header associated with each message retransmitted will contain the Message Sequence Number of the message originally transmitted.

3.07 Maximum Length of Message

The number of characters in any single message, including control characters, will typically not exceed 300 characters.

3.08 SOH, STX and ETX Control Characters

The control characters SOH and STX will be used at the beginning and end of the Header for each message. The ETX control character will follow each message.

3.09 Vertical Parity

Even parity is specified for asynchronous protocols. Odd parity is specified for synchronous protocols. Vertical parity is mandatory.

3.10 Horizontal Parity

At the option of the Information Provider, one (1) or more horizontal parity characters may be used immediately following the ETX control character.

4.01 Field Group Definition and Content

Most messages are comprised of Field Groups defined in this chapter. Each Field Group contains one (1) or more fields defined below. To reduce repetition, Field Groups are descriptively titled and will be referred to hereafter by title alone.

Title	Content	Length
Header		
	SOH control character	1
	Exchange ID	2
	Vendor ID	2
	Product Classification Code	1
	Category Code	1
	Type Code	1
	Message Day Code	1
	Message Sequence Number	7
	Message Time Stamp	7
	Session ID	1
	STX Control Character	1
		25

Product Classifications

One of the advantages of this specification is its ability to identify the type of product supported by the particular message type within a Field Group titled "Product Classification".

Title	Content	Length
<u>Index Symbol</u> (PCC Value of "D")		
	Product Classification Type	1
Global Index	Product Code	1
	Calculation Type	1
	Country Origin, World Code	2
	Currency Code	2
	Industry Group	3
Index Symbol	Suggested Index Symbol	10
	Total	20

Title	Content	Length
Price ID	Price Fractional Indicator	2
	Price	7
	Price Sign	1
	BAT Code	1
	Price Indicator	<u>1</u>
	Total	12

Title	Content	Length
Global Index	Product Code	1
	Calculation Type	1
	Country Origin, World Code	2
	Currency Code	2
	Industry Group	3
		9

Total Volume	Total Volume Traded	12
As-of Sequence Number	As-of Sequence Number	7
Indicators:		
	Market Direction Indicator	1
	Volume Indicator	1
	Day Indicator	1
	Special Range Indicator	1
Date	YYYYMMDD	8
ETX	ETX control character	1

4.02 Message Header

The Message Header will consist of the following fields:

Content	Length
SOH control character	1
Exchange ID	2
Primary, Backup Indicator	1
Data Quality Indicator	1
Vendor ID (redefines the Primary/Backup, and Data Quality Fields above)	2
Product Classification Code	1
Category Code	1
Type Code	1
Message Day Code	1
Message Sequence Number	7
Message Time Stamp	7
Session ID	1
STX Control Character	1
	25

4.02.1 Exchange ID

Two (2) C/A Characters will identify the Index Grouping under which the specific Index should apply. The following Exchange ID code has been specified:

<u>Code</u>	<u>Index Grouping</u>
"DJ"	Dow Jones

4.02.2 Vendor ID, Primary, Backup Indicators

Vendor ID field will be used for communication between the Exchange and vendors and interested parties. Other fields listed below (such as **Primary, Backup, and Data Quality Indicators**) simply REDEFINE the '2 byte' Vendor ID, **and are used between Dow Jones and CBOT computer systems.**

4.02.2.1 Vendor ID

Two (2) P/A Characters will identify the vendor to which a retransmission or Refresh message is addressed. Vendor ID codes, if applicable, have been specified in the Appendix. In the normal transmissions to vendors, this field will remain blanks.

4.02.2.2 Primary, Backup Indicator

"P" will indicate Primary Feed, "B" for Backup.

4.02.2.3 Data Quality Indicator

"G" will indicate Good Data, "B" for Bad.

4.02.3 Product Classification Code ("PCC")

The Product Classification Code refers to the type of product being transmitted in this message, such as a futures contract, options contract, a combination contract, a cash instrument, or an Index.

Each product classification code will reflect the structure and size of the message. The following tables reflect the message sizes as defined by the category code and product classification code. Combinations with legs are variable dependent on the number legs. Sizes per leg are reflected in the second table.

<u>Product Code</u>	<u>Code</u>
Administrative (including Text or Control Messages)	A
Cash Index	I

4.02.4 Category Code

The Message Category Code will identify the following fundamental message formats and contents.

<u>Code</u>	<u>Message</u>	<u>Section</u>
C	Control	5.03
D	Open-High-Low-Last	5.04
S	Summary	5.21

4.02.5 Type Code

Type codes are generally used for insert, delete, and revise capabilities. Type Code "I" = insert, Type Code "D" = delete, Type Code "R" = Revise. An as-of-sequence number is specified before the ETX whenever an insert, revise or delete message is transmitted. Type Code of " " (Blank) indicates a regular message transmitted.

4.02.6 Message Day Code

The defined trading day to which the information applies is defined by the following codes:

<u>Code</u>	<u>Day</u>
1 - 9	1 - 9
0	10
A - U	11-31

Note: In cases where the defined trading day begins with an afternoon or evening trading session, the Message Day Code will not match the calendar date of the transmission until after midnight.

4.02.7 Message Sequence Number

Every message will contain a seven (7) digit, numeric Message Sequence Number.

The Message Sequence Number counter will be reset to zero (0) by the generation of the Start of Communications Testing control message. All transmissions (except simulated data from Start of Simulated Data through End of Simulated Data, inclusive) between the Start of Communication Testing Control Message, up to and including the Start of Official Transmissions control message, will have a Message Sequence Number of zero (0). The Message Sequence Number will be set to one (1) when the Start of Official Transmissions control message is sent. The Message Sequence Number will be incremented by one (1) as each succeeding message, not a retransmission of a preceding message, a Refresh Message, or a Line Integrity Verification control message is sent.

Note that the set Message Sequence Number control message must increment the Message Sequence Number by at least one (1), but may increment such number by more than one (1). When a message is retransmitted, the Message Sequence Number is not advanced; the Message Sequence Number entered in the message is the same as that which was entered in the original message. When a Line Integrity Verification control message or a Refresh message is sent, the Message Sequence Number is not advanced; the Message Sequence Number of the preceding message is sent.

4.02.8 Message Time Stamp

Each message will always contain the time stamp, in terms of **Eastern Standard Time**, of the event causing the message. Current messages, (i.e., messages which are sent in a timely and sequential manner) will carry the system time at which they were entered. Insert and Delete messages, sent either out of sequence, or in an untimely manner in sequence, will carry the exchange system time as of the time of the original transaction. Time will be represented as HHMMSS.T (The "T" represents tenths of a second)

4.02.9 Session ID

The session ID used in a message represents the session to which the data pertains, not necessarily the current session. Session ID will remain blank for Index distributions included in Category D.

For Category S transmission, Session ID is defined as follows:

<u>Value</u>	<u>Summary information based upon</u>
Blank	World Close
1	Asian Close
2	European Close
3	Americas Close

4.03 Product Classification

4.03.1 Index Symbol

Index Symbols are 20 characters in length, and broken down as follows:

Field	Length
Product Code	1
Calculation Type	1
Country, Region, World Code	2
Currency Code	2
Industry Group	3
Suggested Contract Symbol	10

4.03.2 Product Classification Type (PCT)

As a further definition of the type of future or option, the Product Classification Type represents a special type of futures or options contract. Listed below are the type codes with associated definition.

<u>Type Code</u>	<u>Definition</u>
Space	No Further Definition included (See PCC for Product Definition)
I	Index Values

4.03.3 Day Code

The **Day Code** is defined by the following codes:

<u>Code</u>	<u>Day</u>
-------------	------------

Space	Not Applicable
1 - 9	1 - 9
0	10
A - U	11-31

4.04 Price ID

4.04.1 Price Fractional Indicator Code

Values of "02" for 1/100ths based pricing, and "03" for 1/1000 based pricing are supported.

4.04.2 Price

The Price field will be a seven (7) character numeric field.

4.04.3 Price Sign

This is a one character code which represents a "+" for a positive number (or Zero) and "-" for negative number. A blank will be used when the Price itself is blank.

4.04.4 BAT Code

Associated with any price field will be a BAT code to designate the price as a Bid, Ask, or Trade, as defined below.

<u>Code</u>	<u>Indication</u>
T	Trade
Space	Other types of prices (e.g., Settlements, Index Levels, etc).

4.04.5 Price Indicator

Price indicators are used to specify unusual pricing conventions. Current definitions include:

<u>Code</u>	<u>Indication</u>
Space	Normal
B	Blank out the associated price on displays
P	Percentage (Numeric value represents a percentage)

4.05 Total Volume

The Total Volume traded during the day may be indicated in a twelve (12) digit numeric field. Associated with many total Volume fields will be an indicator to designate the volume reported as either estimated or actual volume. If Total Volume is not provided this field will be space filled.

4.06 As-of Sequence Number

For an Insert or Delete message reference will be made to the As-of Sequence Number to indicate the sequence as of when the transaction occurred.

The message Type Code "I" will indicate that the message is to be inserted; the As-of Sequence Number will indicate the Message Sequence Number immediately preceding the message to be inserted. The As-of Message Sequence Number may be filled with the Message Sequence Number of the immediately preceding message for the same contract, or for any message of any Category or Type; for example, if a May wheat contract message sent at 08:08:08.5 with a Message Sequence Number of 080008 is followed by a Text message at 08:08:09.1 with a Message Sequence Number of 080009, a May wheat transaction which occurred at 08:08:10.2 may be inserted with an As-of Sequence Number of either 080008 or 080009, at the option of the exchange. If more than one (1) message is inserted with the same As-of Sequence Number reference, the sequence of the inserted messages will be indicated by their respective time stamps; however, for vendors which do not store (and therefore cannot compare) time stamps, it is recommended that the messages be deemed to be inserted in the sequence transmitted by the exchange.

The Message Type Code "D" will indicate that the message is to be deleted; the As-of Sequence Number will indicate the Message Sequence Number of the original message to be deleted.

The As-of Sequence Number will be a seven (7) digit numeric field.

4.07 Indicators

Indicators can be used for various purposes depending on the type of message. If there is an indicator designated for a message, it will be described in the field group definition of each message in Chapter 5. Following is a list of each type of indicator, its possible values along with its associated definition.

4.07.1 Market Direction Indicator:

<u>Code</u>	<u>Definition</u>
Space	Market direction not indicated

4.07.2 Day Indicator:

See Day Code (Section 4.03.3)

4.07.3 Volume Indicator:

<u>Code</u>	<u>Definition</u>
Space	Volume Field Not Updated
A	Actual
E	Estimated

4.07.4 Range Indicator:

<u>Code</u>	<u>Definition</u>
-------------	-------------------

C	Close
---	-------

Close

- Refers to the last trade or trading activity for each product

4.08 **ISIN**

ISIN (International Securities Identification Number) identifiers for a specific index is supplied within the appropriate message type.

4.09 **ETX Control Character**

Each message will end with an ETX control character.

5.00 Message Definitions

5.01 Category Code C - Control Messages

Control messages update vendors' systems with significant system status changes and to test system integrity. Control messages will consist of a standard Header including a Category Code and a Type Code, used to explicitly identify the system control message. The text of a control message will consist of 46 P/A Characters, plus a 47th ETX control character, and will contain a specified message structure which is subject to processing by vendors' systems.

Field Group	Fill	Length
Header	Header	25
Control Message	46 Bytes	46
ETX	ETX	1
		72

Valid message Type Codes are as follows:

5.03.1 Type Code K - Set Sequence Number

The Set Sequence Number message will be transmitted to advise vendors that the Message Sequence Number is to be reset to the value registered in the Message Sequence Number in the Header Field Group of the message.

This message is often used to reset the sequence number to 1 once all end-of-day processing and transmissions are completed.

5.03.2 Type Code T - Line Integrity Verification

The Line Integrity Verification message will be transmitted each minute to verify continued integrity of the communications line. The Line Integrity Verification message will not interrupt a transmission in progress but may be transmitted whether or not additional messages are queued for transmission.

5.03.3 Formats of Control Messages

Control messages will be formatted as follows:

```
0000000001111111112222222222333333333344444444  
1234567890123456789012345678901234567890123456
```

Type Code

```
K      SET SEQUENCE NUMBER  
T      LINE INTEGRITY VERIFICATION    MMDDYY HHMMSS
```

5.02 Category Code D - Open-High-Low-Last Messages

Field Group	Fill	Length
Header	Header	25
Product Classification	Dependent upon PCC field value	20
Price I D	Opening Price	12
Market Direction Indicator	Opening Price Market Direction Indicator	1
Price I D	Special Opening Price	12
Market Direction Indicator	Special Opening Price Market Direction Indicator	1
Price I D	Percentage of Stocks Open	12
Price I D	High Price	12
Price I D	Low Price	12
Price I D	Last Price	12
Market Direction Indicator	Last Price Market Direction Indicator	1
Price I D	Net Change	12
Price I D	Net Change Percentage	12
Total Volume	Total Volume	12
Volume Indicator	Volume Indicator	1
ETX	ETX	1
		158

The Open-High-Low-Last message for a given Index will be sent at a specific time interval, to be determined by the Information Provider.

5.03

Category Code S - Summary Messages

<u>Field Group</u>	<u>Fill</u>	<u>Length</u>
Header	Header	25
Product Classification	Dependent upon PCC field value	20
Price I D	Opening Price	12
Market Direction Indicator	Opening Price Market Direction Indicator	1
Price I D	High Price	12
Price I D	Low Price	12
Price I D	Closing Price	12
Market Direction Indicator	Closing Price Market Direction Indicator	1
Closing Price Range Indicator	Closing Price Range Indicator	1
Price I D	Previous Business Day's Closing Price	12
Market Direction Indicator	Previous Business Day's Closing Price Market Direction Indicator	1
Day Indicator	Previous Business Day's Day Indicator	1
Price I D	Net Change	12
Price I D	Net Change percentage	12
Total Volume	Total Volume Traded	12
Volume Indicator	Volume Indicator	1
Price I D	52 Week High Price	12
Date	52 Week High Date	8
Price I D	52 Week Low Price	12
Date	52 Week Low Date	8
ISIN	Assigned ISIN	12
Global Index	Global Index	9
ETX	ETX	1
	Total	209

For Category S transmission, Session I D is defined as follows:

Value **Summary information based upon**

Blank	World Close
1	Asian Close
2	European Close
3	Americas Close

Appendix

Miscellaneous

Transmission Timings

Listed below is an indication of the approximate times during which various types of information will be sent. Times may vary during unusual circumstances (or subject to change at the discretion of the exchange).

Approximate Time (EST)	Information Content (Representative List)
9:00 - 4:30 PM	DJ Domestic Indices (Global Index Field Product Code D) Daytime Open Outcry Trading Category Codes: C, D, S
4:00 - 4:45 PM	DJ Domestic Indices (Global Index Field Product Code D) Completed End of Day Information Category Codes: C, D, S
6:00 - 6:30 PM	Line Integrity Verification, Reset Sequence Number Category C (Type K, T)
5:30 PM - 5:30 PM	DJ Regional Indices (Global Index Field Product Code W) Category Codes: Codes: C, D, S Note that these indices are disseminated around the clock, except on Saturdays, from 5:30 p.m. to 12 Midnight (Eastern time).

General Global Index Information

Symbol Overview

Each index disseminated over the Dow Jones data feed has a 9-character Global Index output symbol:

- 1 character for product category
- 1 character for calculation method (i.e., price return or total return)
- 2 character for country, region or world
- 2 character for currency type
- 3 character for composite, sector, or industry

Each index also has a suggested ticker symbol character length as follows:

Dow Jones Global Indexes

5-character symbol for price return indexes

6-character symbol for total return indexes

Dow Jones REIT Indexes (U.S. Only Indexes)

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3-character symbol for price return indexes

4-character symbol for total return indexes

Please be advised that the eleven country indexes are calculated in local currencies and the nine regional indexes are calculated in U.S. dollars. In the future, a one character currency code will be added to the symbol as a suffix if a country index is calculated in a currency other than its local currency, or if a regional index is calculated in a currency other than the U.S. dollar. For example, symbols for Dow Jones Taiwan Stock Index's local and U.S. dollar series would be TWDOW and TWDOWD, respectively.

Dow Jones Global Index Output Procedures

The Dow Jones Global Indexes can be divided into 3 groups when discussing dissemination time frames. These groups are local country indexes, foreign currency country indexes, and regional indexes. Each group has rules and patterns regarding output.

1. Local country indexes calculated in the home currency are only calculated when the exchange is actively trading. Dissemination of these indexes begins when the first trade is received for a component stock. Dissemination of each local country index continues until shortly after each market is closed.

2. Regional indexes include both region and world level indexes. A regional index is any index containing components from more than one country. Currently, the Dow Jones World Index contains 34 countries. Output of these indexes is triggered by the first calculation of the index, regardless of whether the calculation is caused by a stock price or exchange rate change. These indices are disseminated around the clock, except on Saturdays, from 5:30 p.m. to 12 Midnight (Eastern time).

3. Foreign currency country indexes are country indexes calculated in a currency other than the home currency. These indexes open on the first trade of a component stock or with the first exchange rate received.