ReferencePoint™
ASXOnline and Gateway Information

The definitive reference data service, direct from the source

ASX Market Information
Information Solutions from the Source

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Introduction

ASX Market Information is a financial information service provider delivering daily market information from the Australian Security Exchange's single integrated trading platform known as the ASX Trading System (ASX Trade), the Company Announcements Platform (CAP) and the central securities depository (CSD) system EXIGO .

This document provides information on access to the ASX Market Information ReferencePoint products or services via ASXOnline and VPN.

Access to ASX Market Information ReferencePoint Products

ReferencePoint products can be accessed:

– via internet connection utilising ASXOnline B2B web portal
– via VPN utilising the TCP/IP communications protocol

Becoming a Subscriber via ASXOnline

System Introduction

ASXOnline is an innovative extranet site from ASX, developed to meet your needs by providing information efficiently and cost effectively.

The site offers subscribers fast access to products and information while maintaining security through unique user names and passwords. ASX Online has been specifically designed to be flexible and easy to use. You will find the navigation bar takes you quickly to the information you need.

Access and Availability

The ASXOnline Site has a scheduled availability of 12:00am Monday – 12:00pm Saturday, Australian Eastern Standard Time, with a maximum downtime of 15 minutes in this period.

Refer to the Communications section on the following page for a full description of the recommended configuration for accessing ASXOnline.

Website Details

The ASXOnline Website has a unique URL:

https://www.asxonline.com/Marketinfo/Login

This is the only means of accessing the Website.

ASXOnline ReferencePoint queries can be directed to the Market Access team via email (Market.Access@asx.com.au) or phone 1800 663 053.

Security Identification

Security Identification is defined by a unique combination of a user name and password. The only means of gaining a username and password for the ASXOnline Site is from the ASX Market Information Contracts & Subscriptions Coordinator.

The Contracts & Subscriptions Coordinator can be contacted via email at Market.Information@asx.com.au or phone on (02) 9227 0564.

Prior to receiving a username and password, the subscriber must have signed and returned two original copies of the Subscription Agreement. The user name and password will be sent by way of a personally addressed letter.

Security Identification Validity

It is the Subscriber's responsibility to protect the confidentiality of the Security Identification and prevent its unauthorised use or distribution. If the confidentiality of the Security Identification is compromised, the Subscriber must notify the ASX Market Information Contracts & Subscriptions Coordinator in writing immediately and a new Security Identification will be issued. The compromised Security Identification will be cancelled on receipt of the above written notice.

ASX may also cancel or suspend a Subscriber's Security Identification where misuse or abuse of access to the ASXOnline site has been identified. In this instance, ASX will notify the Subscriber in writing.

User Name and Password Changes

If the user requires either the username or password to be changed, the user need to complete the Subscription Details Change form that can be printed off from the Feedback section of the ASXOnline site. The change details will be advised either verbally or via two separate emails –one containing your user name, and one containing your password.

Communications for ASX Online subscribers

To access ASXOnline, it is necessary that the Subscriber provide their own computer and communication equipment at their site. The equipment required can vary depending upon the sophistication and requirements of the subscriber. ASX recommends as a minimum configuration:

Browser:

Internet Explorer 3.x or higher
Netscape Navigator 3.x or higher

Modem Speed:

> 33.6 k

Feedback

The Feedback Sections provides the User with:

- ability to comment on site via the online survey
- ability to change subscription details
- ability to change address details

General Conditions

This section outlines the Conditions of Use or legalities and user obligations in using the site. All Users should read this section when they access the ASXOnline site. There are links to the General Conditions from all other pages within the site.

Support Contact Details

Subscribers experiencing technical difficulties or have product content queries should contact the ASX Market Access team between 8:00am and 6:00pm on ASX trading days. Contact details are as follow:

email: Market.Access@asx.com.au
or phone: 1800 663 053 (+612 9227 0372 from outside Australia)

Becoming a Gateway Subscriber

In order to become a Gateway subscriber, a subscriber must have decided to take an ASX Market Information electronic data feed (currently, these data feeds comprise ReferencePoint and Signal B broker trades service) and must have signed the relevant service contract. The subscriber needs to also have contacted an ASX approved VPN service provider and purchased & installed a VPN connection. Once this process is completed, permission will be granted by ASX and will issue the subscriber with a unique login (username and password) for use to gain access to the ReferencePoint service.

Communication Protocols for Gateway Users

The Gateway is a multi-purpose interface which allows the transfer of information between the ASX's computer systems and externally connected computers.

Communication between the Gateway and a subscriber requires a physical connection, a programmatic interface and knowledge of the Gateway application protocol.

For details on accessing the Gateway, refer to the following Sections:

> Service Retransmission Requests
> Becoming A Gateway Subscriber
> Connecting to the ASX Gateway
> Gateway Protocol Definition
> Gateway Message Formats

Transmission Format

The transmission format will be in one of three (3) forms depending on the transmission technique used. The transmission format does not affect the content of the data, but changes the message header and trailer.

TCP/IP Format

A TCP/IP dissemination message comprises a:

- message length
- standard header
- message body

	Application Message	
Message Length	Standard Header	Message Body
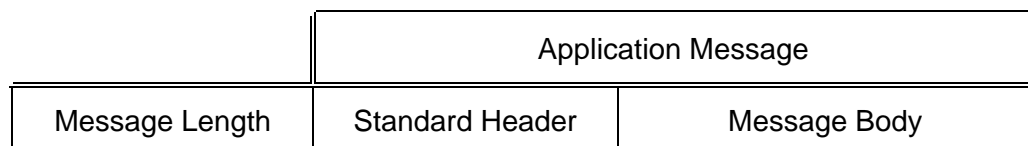
Message Length

This is a 2-bytes unsigned integer value that represents the total length of the Application Message (i.e. the standard header and the message body). This 2-byte field must be transmitted in **big endian** byte ordering.

This message length value has been prefixed to the application message because TCP/IP is not record based and the application messages are of variable length.

Application Message

The Application Message is a signal specific message. The Message Structure section in this manual provides details of the message structure of each of the messages disseminated as part of the ReferencePoint service. These messages represent the TCP/IP Application Message.

A subscriber will not have a carriage return appended to their records as the Big Endian programming protocol detects the message length (see Appendix D for details on the Big Endian protocol).

Gateway System Retransmission Requests

An important feature of the Gateway system is the provision for subscribers to recover from errors of any sort by issuing retransmission requests.

A retransmission login request is achieved by setting the **RETRANSMIT FLAG** in the service request message to **'R'**. Fields have to be set within the service request to specify the session plus the range of messages to be received.

The Job-ID should also be specified for the session to be retransmitted. If it is not specified, Gateway will resume at the most recent session for the subscriber and the service in question. However, the ASX recommends that the Job-ID be identified.

The **RETRANSMIT FLAG** field is an alphanumeric field and is 1 byte in length. It forms part of the Signal service request message which subscribers are required to send to the ASX Gateway system to access Signals data. It should be set if the subscriber wishes to resume a previous Gateway session for the current trading day. The valid values that this field may carry are:

> R = Retransmission Request
> [ ] = Request for a new Gateway session

After sending a Signal request to the Gateway, subscribers should then receive the corresponding data message. The data message carries a **RETRANSMISSION INDICATOR** which is a 1 byte field of numeric format indicating whether the message sent is as a result of a first-time service request or a retransmission request. The valid values that this field may carry are:

> 0 = Message sent in response to a normal service request
> 1 = Message sent in response to a retransmission request

As the sequence numbers for retransmission are identical to those sent for the original request, the Subscriber can specify the sequence number from which the retransmission should commence. The Start Sequence Number specifies the first sequence number to be retransmitted for a range of messages, while the End Sequence Number is used to specify the last sequence number. The Gateway session will terminate as soon as the data message containing this sequence number has been sent. Where no end message has been specified, the ASX will send all messages up to the logical end of the session.

Messages transmitted to a subscriber are logged periodically to a checkpoint journal. If no sequence number is specified, the ASX will begin from the most recent message for which a checkpoint has been written. It is the responsibility of the Subscriber to check if any of the messages have already been correctly received.

If for some reason a subscriber tries to log onto the Gateway and the service or data is not available, a subscriber **should not** attempt to log on at a later time using the retransmission format. Unless a service reply has been sent by Gateway **with** a job id, then the subscriber should assume Gateway has not acknowledged their log on and stored their latest details in its logs. Subscribers should therefore send a service request assuming a new (first-time) session format.

Sections Gateway Message Formats and Gateway Message Fields Definitions of this Manual set out examples of Signal request message formats that carry the **RETRANSMIT FLAG** field. Subscribers should use these messages

to access data from the Gateway. The M and/or O in brackets after each field name, indicate whether the field is mandatory or optional. If a field is mandatory, either:

– Gateway will always transmit data in this field (if a Gateway response) OR
– The subscriber must enter data in this field (if the command is a subscriber response/reply)

Connecting to the ASX Gateway

Connection to ASX's computer systems is via a Transfer Control Protocol / Internet Protocol (TCP/IP) Virtual Private Network (VPN) supplied and managed by either::

– An ASX approved 3rd party network provider. For information on ASX approved VPN providers, contact the ASX Market Information team (Market.Information@asx.com.au)
– ASX utilising ASX's Internet VPN offering (iVPN)

Connecting Through Shared Virtual Private Network

A connection to the Gateway can be made from any device that runs the TCP/IP protocol. The necessary infrastructure required for TCP/IP connections can be provided by an ASX approved VPN service providers.

This will generally comprise a router and, depending on what level of redundancy is required, either One/Two Frame Links and/or an ISDN connection. The infrastructure is likely to take up about ½ of a cabinet shelf and about 5 RU's.

With the Introduction of a TCP/IP network, security becomes a concern. The ASX server side has been placed behind firewalls with locked down security. The security at a client's side is up to each individual client. Although not mandatory, it is highly recommended that all clients have a firewall or other security model in place, between themselves and the external VPN Network.

Connecting Through an Internet Virtual Private Network

A connection to the Gateway can be made from any device that runs the TCP/IP protocol. Internet VPN requires that customer has an internet connection and a VPN client application supported by CISCO's VPN concentrator platform.

Customers must also be aware of the inherent risks associated with the internet delivery mechanism e.g.:

▪ Security.

▪ Availability

▪ And non guaranteed delivery.

ASX Approved VPN Providers

Charges/fees may vary between carriers. For charges/fees information, refer to relevant VPN provider. All the ASX approved VPN providers understand what is required for the ASX service and will set the service up accordingly.

Below is the list of ASX approved VPN providers.

☏ **Optus**
Product Name: eFinity
☏ **Radianz**
Product Name: Radianz Net

☎ **Telstra**
Product Name: Telstra COIN

For more information, refer to the VPN Service Guide document found on ASX Online Market Information – Product Information web page under the Delivery and Support folder\Virtual Private Network sub-folder.

https://www.asxonline.com/marketinfo/product.shtm

Gateway Protocol Definition

General Message Flow

Once a Subscriber has established a connection with the ASX computer system, they are required to enter into a dialogue with the Gateway system. For each message type below, refer to the Gateway Protocol Definition and Gateway Message Definitions sections.

Logon Request
Subscriber   ------------------------------------>   ASX/GATEWAY
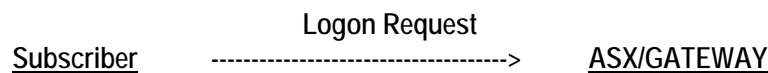
The subscriber first sends a logon request, which identifies the subscriber to the Gateway system. This request is validated by ASX to ensure that the subscriber is authorised to use the system.

Logon Reply
Subscriber   <------------------------------------   ASX/GATEWAY
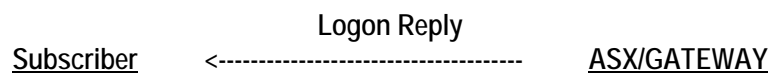
A logon reply is sent from ASX to the subscriber, with the status code and text fields indicating a successful logon, or the reason for rejecting the logon request.

Service Request
Subscriber   ------------------------------------>   ASX/GATEWAY
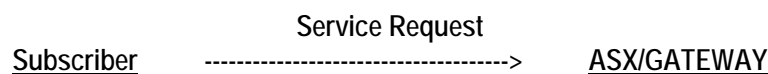
Once successfully logged on, the subscriber sends a service request message. This may be a first time request, or a retransmission request to resume an earlier session. See the section on retransmission for further details.

The service request is validated by ASX to ensure a valid service is being requested, the subscriber is authorised to receive the service, the service being requested is currently available, and the parameters making up the request are valid.

Service Reply
Subscriber   <------------------------------------   ASX/GATEWAY
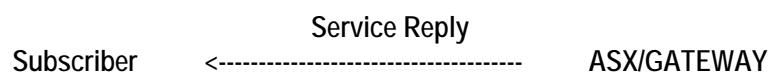
A service reply is then sent from ASX to the subscriber, with the status code and text fields indicating a successful request, or the reason for rejecting the request. A successful service reply will include a job identifier, which should be retained by the subscriber and used when making retransmission requests.

If the service request was not successful, then the service reply will be immediately followed by a logoff message.

Data

<u>Subscriber</u>   <------------------------------------   <u>ASX/GATEWAY</u>
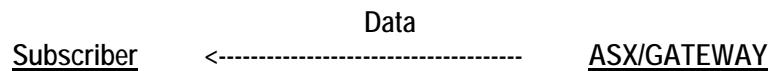
After a successful service request, ASX will begin transmission of data messages, the number and content of which will depend upon the nature of the request. (Refer to Message Formats and Fields Definitions sections for details of data message types and content.)

Session Termination

<u>Subscriber</u>   <------------------------------------   <u>ASX/GATEWAY</u>
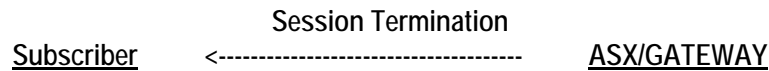
Once all data has been sent, or should an error occur before all data has been sent, ASX shall send a termination message. This message will contain status code and text fields, indicating the reason the session was terminated.

Logoff

<u>Subscriber</u>   <------------------------------------   <u>ASX/GATEWAY</u>

A session termination message will always be immediately followed by a logoff message. The subscriber is expected to clear the session once the logoff message has been received.

Gateway Message Formats

Outlined below are the message formats for accessing data from Gateway. Each field is described in alphabetical order in the Gateway Message Fields Definitions section with such details as the number of bytes, format and relevant valid values included.

The M and/or O in brackets after each field name indicate whether this field is mandatory or optional. If a field is mandatory, either Gateway will always transmit data in this field (if a Gateway response) or the subscriber must enter data in this field (if the command is a subscriber response/reply).

Logon Request   18 bytes

Gateway Message Code (M)	Subscriber Code (M)	Subscriber Password (M)
2	8	8

Logon Reply   128 bytes

Gateway Message Code (M)	Status Code (M)	Text Length (M)	Text (O)
2	2	3	=<121

Logoff   2 bytes

Gateway Message Code (M)
2

Data Message   Variable Bytes

Gateway Message Code (M)	Sequence Number (M)	Message Type (M)	Retransmission Indicator (M)	Data (M)
2	6	2	1	Variable

Service Reply   128 bytes

Gateway Message Code (M)	Job ID (M)	Status Code (M)	Text Length (M)	Text (O)
2	4	2	3	=<117

Session Termination   128 bytes

Gateway Message Code (M)	Job ID (M)	Status Code (M)	Text Length (M)	Text (O)
2	4	2	3	=<117

* __Generic Signal Request – 23 bytes__ - subscribers should send this message to the ASX Gateway system to access data for Signal B:

Signal Request Code (M)	Job ID (M)	Compression Indicator (M)	Retransmit Flag (M)
2	4	1	1

Service Option Code (M)	Termination Flag (M)	Start Sequence Number (M)	End Sequence Number (M)
2	1	6	6

__ReferencePoint Daily Official List Request – 27 Bytes__ - subscribers should send this message to the ASX Gateway system to access data for the ReferencePoint Daily Official List service (intraday and end of day price snapshot services) :

Signal Request Code (M)	Job ID (M)	Compression Indicator (M)	Retransmit Flag (M)	Session Indicator (M)
2	4	1	1	2

Service Option Code (M)	Termination Flag (M)	Start Sequence Number (M)	End Sequence Number (M)
4	1	6	6

__ReferencePoint Master List and Corporate Actions Request – 23 Bytes__ - subscribers should send this message to the ASX Gateway system to access data for the ReferencePoint Master List and Corporate Actions services:

Signal Request Code (M)	Job ID (M)	Compression Indicator (M)	Retransmit Flag (M)	Service Option Code (M)
2	4	1	1	2

Termination Flag (M)	Start Sequence Number (M)	End Sequence Number (M)
1	6	6

Gateway Message Field Definitions

COMPRESSION INDICATOR

Bytes	:	1
Format	:	Alphabetic
Description	:	Indicates whether or not data is to be compressed before transmission.
Valid Values	:	C = Compression required = Compression not required.

END SEQUENCE NUMBER

Bytes	:	6
Format	:	Numeric
Description	:	When issuing a retransmission request, this field indicates the last sequence number required. This session will be terminated as soon as this message has been retransmitted.
Valid Values	:	000000 (all zeros) YYMMDD (where yy = year, mm = month and dd=day)

JOB ID

Bytes	:	4
Format	:	Numeric
Description	:	A unique number allocated by the Gateway system to identify a particular Gateway session for a given subscriber and service. This number appears in the Service Reply message once a successful Service Request has been made, and should be used by the subscriber in subsequent retransmission requests.
Valid Values	:	N/A

GATEWAY MESSAGE CODE

Bytes	:	2
Format	:	Numeric
Description	:	Specifies the reason for the Gateway message.
Valid Values	:	01 Logon request 02 Logon reply 03 Logoff 04 Data 05 Service Reply 07 Session Termination

MESSAGE TYPE

Bytes	:	2
Format	:	Alphabetic
Description	:	Identifies the type of message being transmitted and enables the subscriber to identify the message format.
Valid Values	:	Refer to the Message Types and Field Definitions sections in this Manual for data message types and content.

RETRANSMISSION INDICATOR

Bytes	:	1
Format	:	Numeric
Description	:	Indicates whether the message sent is as a result of a first-time service request or a retransmission request.
Valid Values	:	0 = Message sent in response to a normal service request. 1 = Message sent in response to a retransmission request.

RETRANSMIT FLAG

Bytes	:	1
Format	:	Alphabetic
Description	:	Forms part of the service request, and should be set if subscriber wishes to resume a previous Gateway session for the current trading day.
Valid Values	:	R = Retransmission Request [ ] = Request for a new Gateway session

SESSION INDICATOR

Bytes	:	4
Format	:	Alphanumeric
Description	:	Forms part of the service request for selecting the snapshot session required for the ReferencePoint Daily Official List service.

Valid Values   :

1100	-	11:00 hourly snapshot
1200	-	12:00 hourly snapshot
000M	-	Morning (end of morning) snapshot
1400	-	14:00 hourly snapshot
1500	-	15:00 hourly snapshot
1700	-	17:00 hourly Snapshot
000A	-	16:00 Afternoon Equity Snapshot
00AD	-	17:00 Afternoon Derivatives Snapshot
000E or 1900	-	Evening (end of day) Snapshot

SERVICE OPTION CODE

Bytes	:	2
Format	:	Numeric
Description	:	Forms part of the service request for selecting the options required for a Signal.
Valid Values	:	Refer to Appendix E in this Manual for relevant value for signal in question.

SEQUENCE NUMBER

Bytes	:	6
Format	:	Numeric
Description	:	A sequential number allocated by the Gateway system and specific to a particular session with a given Subscriber. Unless a retransmission request has been made, the first data message sent shall always contain the sequence number "000001". Subsequent messages will have the sequence number incremented by one.
Valid Value	:	N/A

SIGNAL REQUEST CODE

Bytes   :   2

Format   :   Numeric

Description   :   Value to request a specific signal.

Valid Values   :   Refer to Appendix E in this Manual for the Signal Request Code applicable for this signal.

START SEQUENCE NUMBER

Bytes   :   6

Format   :   Numeric

Description   :   Indicates the first sequence number required when requesting a retransmission.

Valid Values   :   N/A

STATUS CODE

Bytes   :   2

Format   :   Numeric

Description   :   Used in various Gateway messages to indicate the reason for message. Information is generally given in the text field.

Valid Values   :   See Appendix B.

SUBSCRIBER CODE

Bytes   :   8

Format   :   Alphabetic

Description   :   Issued by the ASX to identify a particular subscriber. It is used in conjunction with the Subscriber Password to gain access to the Gateway system.

Valid Values   :   N/A

SUBSCRIBER PASSWORD

Bytes   :   8

Format   :   Alphanumeric

Description   :   Issued by the ASX, it is used in conjunction with the
                             Subscriber Code to gain access to the Gateway system.

Valid Values   :   N/A

TERMINATION FLAG

Bytes   :   1

Format   :   Numeric

Description   :   Selects the conditions under which the Gateway
                             session will be terminated.

Valid Values   :   1   =   Remain active until all data for the day
                                               has been sent
                             0   =   Terminate session as soon as all
                                               currently available data has been sent.

TEXT

Bytes   :   Variable (see Appendix B: Status Code Values.)

Format   :   Alphanumeric

Description   :   Used to give additional meaning to a status code.

Valid Values   :   N/A

TEXT LENGTH

Bytes   :   3

Format   :   Numeric

Description   :   Indicates the length of the message in the text field.

Valid Values   :   N/A

Compression and Decompression Routines

Compression and Decompression Routines

ASX offers the use of data compression when accessing the Gateway.

The compression routine will compress all occurrences of five or more consecutive characters of the same type.

The Gateway Message Code and the Sequence Number will not be compressed. This will allow the subscriber to check for valid sequencing without having to decompress data.

Compressed data will be stored in the format:

Compression Indicator	Compression Character	Compression Count

> The Compression Indicator = Hex 16 (CTRL V)
>
> The Compressed Character represents the character which has been compressed.

The Compression Count is a 2-byte numeric ASCII count of the number of times it has been repeated. The field allows for a maximum of 99 in any single compression.

If the compression character, itself, occurs in the data, it will be represented in compressed format. It is, therefore, possible to have a compression count of 1.

> As an example, take a string of 10 letter A's:
>
> "AAAAAAAAAA"
>
> This would be represented in compressed format as:

HEX 16	A	1	0

To aid subscribers in utilising the data compression facility, we have documented, in pseudo-code, the data compression routine used by ASX and a suggested decompression algorithm. This is a guide only, and needs to be converted into the computer programming language utilised by the Subscriber.

Compression

```
PROCEDURE   COMPRESS (IN-BUFFER, IN-LENGTH, OUT-BUFFER, OUT-LENGTH)

BEGIN
        IN      : = 8
        OUT     : = 8
        NEXT    : = 8
        COUNT   : = 0
```

```
                IN-LENGTH = IN-LENGTH + 1 ;
                ! Skip GATEWAY Function Code and Sequence Number.
                FOR COUNT : = 0 TO 7 DO
                        OUT-BUFFER [COUNT] := IN-BUFFER [COUNT] ;

                WHILE NEXT < IN-LENGTH DO
                BEGIN
                        COUNT : = 0 ;
                        NEXT  : = NEXT + 1 ;
                        ! COUNT will equal number of compressed characters
                        WHILE (IN-BUFFER [IN] = IN-BUFFER [NEXT]) AND (NEXT < IN-
                        LENGTH) AND (COUNT < 98) DO

        BEGIN
                COUNT  : = COUNT + 1
                NEXT    : = NEXT + 1
                END;

        IF COUNT > 3 THEN
        BEGIN ! We have a compression

                OUT-BUFFER [OUT]     :      := COMPRESSION-CHAR ;
                OUT-BUFFER [OUT+1]  := IN-BUFFER [IN]
                OUT-BUFFER [OUT+2   := OUT + 3] := COUNT ;
                OUT                            := IN + 1 ;

                END
                UNTIL IN = NEXT ;
        END
*
        IN := NEXT ;
        END;
*
        OUT-LENGTH := OUT - 1
        END;
```

Decompression

```
PROCEDURE   DECOMPRESS   (IN-BUFFER, IN-LENGTH, OUT-BUFFER, OUT-LENGTH)

BEGIN
        Count   :       = 0
        I       :       = 0
        IN      :       = 0
        OUT     :       = 0

WHILE IN < IN-LENGTH DO
BEGIN
        WHILE (IN-BUFFER [IN] <> COMPRESSION-CHAR) AND (IN < LENGTH)
        DO
        BEGIN ! More data from IN-BUFFER to OUT-BUFFER
                OUT-BUFFER [OUT] := IN-BUFFER [IN]
                OUT                            := OUT + 1 ;
                IN                             := IN + 1 ;
```

```
                     END
*

                     IF IN-BUFFER [IN] = COMPRESSION-CHAR THEN
                     BEGIN
                     ! Get number of compressed characters
                             COMPRESSION-COUNT = IN-BUFFER [ IN + 2] ;
*

                     FOR I := 1 TO COMPRESSION-COUNT DO
                     BEGIN
                             OUT-BUFFER [OUT] := IN-BUFFER [IN + 1] ;
                             ! Compressed character
                             OUT                             := OUT + 1
                     END
*

                     IN := IN + 4
              END ;
              END
              OUT-LENGTH := OUT ;
              END
```

Status Code Values

The table below gives the Status Code Values and their meaning.

CODE   DESCRIPTION

00   **Successful**

            The request has been received and no validation error has occurred.

01   **Invalid Password**

            The password supplied with log-on function is not the password contained on file.

02   **Invalid Subscriber Code**

            The Subscriber Code does not exist on file.

03   **Access to this Service not Permitted**

            The Subscriber has been disabled. Contact ASX for reason.

04   **Gateway Closed**

            Gateway is not open for subscriber access.

08   **Service Closed**

            The service is not open for use.

09   **A Session is Already Active for this Service**

            The subscriber already has a session in progress for this service. Contact ASX if this is not the case.

11   **Unspecified Gateway Error**

            An error has occurred within the Gateway system while attempting to service the request. Contact ASX for more information.

12   **Invalid Parameters**

            A service request was received which contained incorrect or illogical parameters. Check the request parameters, and contact ASX if more information is required.

13   **Subscriber not Configured to Receive this Service**

            The subscriber does not have access to this service.

CODE	DESCRIPTION

17   **Not a Known Signal**

The Gateway message code received when expecting a service request does not correspond to a known signal.

18   **Expecting a Logon Request**

A Gateway message other than a logon request was received before the Subscriber had logged on.

19   **Requested Job ID does not Match this Subscriber Service**

A retransmission request was received for a job not belonging to the subscriber making the request, or not matching the service requested.

20   **Signal Requested Outside the Allowable Times**

A service request was received for a signal which is not available at this time of day.

21   **Requested Job ID Cannot be Found**

A retransmission request was made for a Job-ID which is not known to the Gateway system.

23   **Data Not Available**

The data required to satisfy a service request is not available. The subscriber will need to log in again at a later time, using a normal service request and not a retransmission request.

ISO8208 Frame & Packet Control Parameters

Frame Control Parameters

ISO/CCITT parameter description	Profile Value	ISO/CCITT parameter description	Profile Value
Timer T1 (milliseconds)	2000	Maximum number of transmissions (N2) (count)	20
Parameter T2 (milliseconds)	Null	Maximum number of outstanding frames (K) (count)	7
Maximum number of bits in a Frame (N1) (bytes)	133		

Packet Control Parameters

ISO/CCITT parameter description	Profile Value	ISO/CCITT parameter description	Profile Value
DTE Restart request time (T20)	180	Restart Request Retransmission count (R20)	1
DTE Call request time (T21) (seconds)	200	Reset Request retransmission count (R22)	1
DTE Reset request time (T22) (seconds)	180	Clear request retransmission count (R23)	1
DTE Clear request time (T23) (seconds)	180	Interrupt Response Timer (T26) (seconds)	180
Packetsize (default) (bytes) (maximum)	128 4096	Windowsize (default) (count) (maximum)	2

Big Endian Programming Protocol

Big-Endian

[From Swift's "Gulliver's Travels" via the famous paper "On Holy Wars and a Plea for Peace" by Danny Cohen, USC/ISI IEN 137, dated April 1, 1980] adj.

Describes a computer architecture in which, within a given multi-byte numeric representation, the most significant byte has the lowest address (the word is stored `big-end-first'). Most processors, including the IBM 370 family, the PDP-10, the Motorola microprocessor families, and most of the various RISC designs current in mid-1993, are big-endian.

Data Representation

Some computers are ``big endian''. This refers to the representation of objects such as integers within a word. A big endian machine stores them in the expected way: the high byte of an integer is stored in the leftmost byte, while the low byte of an integer is stored in the rightmost byte.

E.g.: The decimal number 101 (one hundred and one) when converted into hexadecimal (base 16) would be represented by the value 67. I.e. 101 = 6*16 + 7.

If this value was "stored" using big-endian, the digits would be stored as shown below:

		6	7
3	2	1	0

A "little endian" machine stores them the other way.

7	6		
3	2	1	0

To allow machines that use different memory architectures to communicate information correctly then they must agree on the data representation to use. The accepted standard for BSD IP networking is big-endian.

The ASX System will use big-endian as its standard of representing binary/hexadecimal values. This implies that the first byte received on the communication link is the highest order byte of the value being represented.

Example: Transmitting the Logon Message to DP

Data to Transmit: 01AcctNamePassword

Length of Data: 18 (Decimal) = 12 (in Hexadecimal)

Actual Message to DP: <00><12>01AcctNamePassword

First two bytes contain the length in Hex followed by 18 bytes of ASCII data.

Computer systems, like VAX/VMS and Microsoft/NT, store numeric values in Little-Endian Byte Order. In order to transmit a numeric value from a VMS or a NT program to ASX's DP, the bytes need to be re-arranged.

For programs that reference WinSock routines under Windows, it can call the **htons** function to converts a **u_short** from host to TCP/IP network byte order. The **ntohs** function can be called to convert a **u_short** from TCP/IP network byte order to host byte order.

The attached C program, T_ENDIAN.C, demonstrates how an unsigned short value can be stored into / re-constructed from a character array storing data in Big Endian Byte Order.

T_ENDIAN produces the following output:

```
**********************

Testing conversion of 3 ( == 3 )

Dumping bytes in short (Little Endian)...
Byte 0 in Decimal: 3,        in Hex: 03
Byte 1 in Decimal: 0,        in Hex: 00

Dumping bytes in array (Big Endian) ...
Byte 0 in Decimal: 0,        in Hex: 00
Byte 1 in Decimal: 3,        in Hex: 03

Restored Value is 3

**********************

Testing conversion of 258 ( == 256 + 2 )

Dumping bytes in short (Little Endian)...
Byte 0 in Decimal: 2,        in Hex: 02
Byte 1 in Decimal: 1,        in Hex: 01

Dumping bytes in array (Big Endian) ...
Byte 0 in Decimal: 1,        in Hex: 01
Byte 1 in Decimal: 2,        in Hex: 02

Restored Value is 258

**********************

Testing conversion of 51201 ( == 200 * 256 + 1 )

Dumping bytes in short (Little Endian)...
Byte 0 in Decimal: 1,        in Hex: 01
Byte 1 in Decimal: 200,      in Hex: c8

Dumping bytes in array (Big Endian) ...
Byte 0 in Decimal: 200,      in Hex: c8
Byte 1 in Decimal: 1,        in Hex: 01

Restored Value is 51201

**********************
```

Service Option Code and Signal Request Code Values

Signal Name	Option	VPN Filename Format	Signal Request Code	Service Option Code	Session Codes
ReferencePoint Corporate Actions	34 – Standard Corporate Actions	E_34_____YYYYMMDD.mag	10	34	-
ReferencePoint CoS (Course of Sales)	~~Broker Register of Sales – Batch~~ 05 – Course of Sales/Trades	~~I_00_____YYYYMMDD.mag~~ E_05_____YYYYMMDD.mag	~~50~~ ~~10~~	~~00~~ 05	-
ReferencePoint Derivatix (Open Interest)	19 – Open Interest Values	E_19_____YYYYMMDD.mag	10	19	-
ReferencePoint Derivatix (Open Interest) - Hexadecimal format	Open Interest	cb_93_____YYYYMMDD.mag	61	93	-
ReferencePoint DOL (Daily Official List Market Summaries)	06 – Market Summary	D_06_____YYYYMMDD.mag	20	06	1100 1200 000M 1400 1500 000A 000E

Signal Name	Option	VPN Filename Format	Signal Request Code	Service Option Code	Session Codes
ReferencePoint DOL (Derivatives Daily Official List)	04 – ETO's / ASX Futures	D_04_____YYYYMMDD.mag	20	04	1100 1200 000M 1400 1500 00AD 000E 1700(00ED)
~~ReferencePoint DOL (Equities and Derivatives Daily Official List)~~	~~05 – All Securities/Index Summary~~	~~D_05_____YYYYMMDD.mag~~	~~20~~	~~05~~	~~1100 1200 000M 1400 1500 000A 00AD 000E 1700(00ED)~~
ReferencePoint DOL (Equities Daily Official List)	01 – Equity / Index summary	D_01_____YYYYMMDD.mag	20	01	1100 1200 000M 1400 1500 000A 000E
ReferencePoint DOL (Initialisation Quotes) - Hexadecimal format	Initialisation Quotes	cb_92_____YYYYMMDD.mag	61	92	-

Signal Name	Option	VPN Filename Format	Signal Request Code	Service Option Code	Session Codes
ReferencePoint DOLI (Initialisation Quotes)	03 – Quotes	E_03_____YYYYMMDD.mag	10	03	-
ReferencePoint Master List	01 – Security Download	E_01_____YYYYMMDD.mag	10	01	-
ReferencePoint Master List	02 – Security Changes	E_02_____YYYYMMDD.mag	10	02	-
ReferencePoint Master List	04 – ETF's	E_04_____YYYYMMDD.mag	10	04	-
ReferencePoint Master List	09 - Index Master List	E_09_____YYYYMMDD.mag	10	09	
ReferencePoint Master List	11 - Warrant Master List	E_11_____YYYYMMDD.mag	10	11	
~~RefrencePoint DOL (Initialisation Quotes)~~	~~16 – Quotes & trades~~	~~E_16_____YYYYMMDD.mag~~	~~10~~	~~16~~	~~-~~
Signal B	Broker Trades	B_00_____YYYYMMDD_XXXXXXXX.mag where: XXXXXXXX = Subscriber ID	30	00	-

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