

Configuration Reference Manual

**EDACS[®]
Data Advantage[™]**

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INTRODUCTION

This manual is a guide to configuring the Ericsson EDACS® Data Advantage™ for proper operation. In particular, it describes the command set and syntax for the *SYSTEM.TXT* file, which is a special file located in the /cnfg directory of the Data Advantage hard drive. Examples of *SYSTEM.TXT* files for various system configurations are included in the *Data Advantage Installation and Maintenance Manual* (LBI-39190).

The *SYSTEM.TXT* commands have been designed to allow a quick and easy setup for users with a simple system configuration, yet provide the necessary power to users who are designing very complex systems. A general knowledge of Internet Protocol (IP) is assumed on the part of the reader.

USING THE DATA ADVANTAGE CONFIGURATION FILE

The Data Advantage configures itself upon startup based on the contents of the *SYSTEM.TXT* configuration file. Without this file, the Data Advantage will not boot. It is in ASCII format and can be created and modified with any ASCII based text editor.

NOTE

The Data Advantage diskette drive only supports double sided / high density (1.44 MByte) 3.5 inch diskettes. Do not use double density (720 KByte) diskettes.

GENERAL RULES

The following are some general rules about creating and editing the *SYSTEM.TXT* file.

- *SYSTEM.TXT* can be automatically loaded from a diskette when the Data Advantage is rebooted.
- The *SYSTEM.TXT* command parser is not case sensitive. Lower case characters are automatically read as upper case characters. However, file names and names are exceptions to this rule. The Data Advantage file system is UNIX based and, therefore, all file names are case sensitive. File names are discussed further below.
- Unless specifically stated otherwise, any number of spaces or tab characters may be freely placed within the file as field separators. Spaces and tabs are equivalent to the parser, and will be referred to as a space character in the remainder of this manual.
- If a space character is required by a command's syntax, this will be explicitly stated in the command description.
- The Data Advantage only recognizes tabs, line feeds, carriage returns, DOS end of file (CTRL-Z), and printable characters in *SYSTEM.TXT*. Any other characters cause a syntax error.
- The fixed disk and diskette drives are referred to as "01.02" and "01.01", respectively, when using a full path name.
- All file and directory names on the hard disk follow a UNIX format, are case sensitive, must begin with an alphabetic character, and may contain up to 12 characters.
- All file and directory names on the diskette drive follow a DOS format. Names are in upper case, and may not exceed eight characters, plus a three character extension, separated by a period.
- When using a file's full path name, separate the drive name, directories, and file name with the forward slash character ("/"). An example is "01.02/subdir1/subdir2/FILE.EXT".

The SYSTEM.TXT file contains the statements that configure all the system parameters that allow the Data Advantage to function properly. There are basically three types of statements that are entered in this file: commands, table entries, and headings. Commands are used to configure a particular system parameter, table entries contain data that is used for various Data Advantage tables, and headings identify groups of related commands or table entries.

- ◆ A heading statement can have one of two possible forms:

```
[heading]
[heading field_value]
```

The **heading** value is a predefined text string containing no space characters. The brackets, '[' and ']', which identify that this is a heading statement, must be entered. Space characters may be entered before and after the opening and closing brackets, if desired.

For those heading statements that require it, *field_value* must be entered, which is a variable value within the range and in the format specified in the heading statement description. The **heading** and *field_value* must be separated by one or more space characters.

Heading statements are followed by zero or more commands or table entries. Heading statements that are not applicable for a particular configuration may be omitted from the file. Groups of commands and table entries can contain blank lines.

All heading statements, with their associated command blocks, may be placed in any order within the file.

- ◆ Each command statement has the following syntax:

```
keyword field_values
```

The **keyword** value is a predefined text string containing no space characters. The *field_values* are one or more values entered by the user, in the format and within any range specified in the command description. One or more space characters must separate **keyword** and the first field value. Multiple *field values* are also separated by one or more space characters.

Each command statement must be entered on a separate line in the file and may only appear under its associated heading statement. Any command that is not related to the command block's heading will be ignored and will generate a warning. Commands may be placed in any order within the command block.

- ◆ Each table entry is composed of one or more fields, where a field is a value entered by the user in the format and within any range specified in the table description. Table entries may be placed in any order within the table, with one entry per line.
- ◆ The comment character, '#', may be inserted freely within the file. Any text to the right of the comment character is ignored by the parser. If a comment is to be on the same line as a heading or command statement, one or more space characters must precede the '#' character.
- ◆ All required numeric values may be entered in decimal or hexadecimal format. A hexadecimal format is identified by appending the character 'h' or 'H' to the value. The hex characters 'a' through 'f' may be entered in upper or lower case. For example, all of the following represent the same value:
1ab9h, 1ab9H, 1Ab9H, 1AB9h

- ◆ Some fields require an IP address value. This address must consist of four separate numeric values, with each value separated by a period, and no space characters. An address may be entered in decimal or hexadecimal format, with the hexadecimal format as described previously. If using decimal format, the range for each of the four values is 0 - 255, while the range for each of the values using a hexadecimal format is 00 - FF. Note that leading zeros may be used for each of the four values, or may be omitted. For example, all of the following represent the same address:
143.001.04.013, 143.1.004.13, 8F.01.4.dh, 8f.01.04.0dH
- ◆ Some fields allow a numeric range. A range consists of either a single numeric value, or two numeric values separated by a '-' character. Space characters are permitted before and after the '-'. The first value must be numerically less than the second value.
- ◆ Some fields allow a numeric list. A list is composed of one or more numeric values, each separated by a comma. Space characters are permitted before and after each comma. The values may be entered in the list in any order.

This manual uses the following conventions for configuration file command descriptions.

Convention	Usage
<i>italics</i>	A field in italics indicates a variable that you must replace with a value.
BOLD	A word in boldface letters indicates a key word that must be used. You may enter the keyword in upper or lower case letters.
OPTION	Items shown in non-boldface uppercase characters are a specific option that can be selected. You can use them in upper or lower case in the file.
A B C	When options appear with a vertical bar separator, you must choose between one of the options.

On the following page is a summary of the available SYSTEM.TXT commands and headings. Each heading is followed by either its command block, containing all available commands for that heading, or its table entry format. Detailed descriptions and examples for each command and heading follow the summary page.

COMMAND SET SUMMARY

[Board *board_number*]

Label *"board_label"*

Load *loadfile*

Port_Direction *port_number* IN | OUT | BI | OFF

Type CAP | WNI

[EDACS_Network]

EDACS_IP_Network_ID *network_address*

Label *label*

[IP]

CAP_Default_Gateway *ip_address*

CAP_Ext_Address *ip_address*

Host_Name *host_name*

Int_Board_Address *board_number ip_address*

Int_Network_ID *ip_network_id*

Routing_Address *ip_address*

[System]

EDACS_Err_Retry *max_count delay*

Max_FTP_Sessions *session_count*

Max_Msgs *msg_count*

Max_TELNET_Sessions *session_count*

Msg_Timeout *timeout_value*

Transport_Layer_Protocol *protocol_type_code*

[Device_Config_Table]

id_type id_range start_ip_address network_layer

.

.

.

id_type id_range start_ip_address network_layer

[IP_CAP_Ext_Routing_Table]

HOST | NET *destination next_gateway*

.

.

HOST | NET *destination next_gateway*

COMMAND DESCRIPTIONS

[Board] Command Heading

Format: [Board board_number]

The commands under this heading define a board and its associated parameters within the Data Advantage. Each board is assigned a unique identification number which is entered in the *board_number* field. Board numbers must be contiguous, starting at the number "1", which must always be assigned to the CAP board.

[Board] LABEL Command

Syntax:	Label " <i>label</i> "
Requirement:	Optional for all boards
Default:	A text string consisting of the board number and type will be assigned, e.g. "BD 2 WNI", "BD 1 CAP".
Description:	<p>This allows a user defined text string of up to 12 case sensitive characters to be assigned to the board. It is only referenced in messages to the terminal and in any Data Advantage generated reports.</p> <p><i>label</i> may contain any printable ASCII character, including space characters, and must be enclosed by double quotation marks. Labels need not be unique. As many characters as will fit on a single line may be entered as the <i>label</i>, but only the first twelve will be read and saved.</p>
Example:	Board number 2 is a WNI type. No Label command is entered for it. Its default label will be "BD 2 WNI".
Example:	<p>It is desired to assign the label "Ralph the WNI wonder dog" to the current board. The following command would then be entered:</p> <p>Label "Ralph the WNI wonder dog"</p> <p>However, since only the first 12 characters are saved, the actual label assigned to this board would be "Ralph the WN".</p>

[Board] LOAD Command

Syntax: **Load** *filename*

Requirement: Optional

Default: Board 1 defaults to 01.02/loads/DACAP.SX
Board 2 defaults to 01.02/loads/WNI.SX

Description: This command tells the system loader which application file to load onto the board.

filename should be the full pathname of the file to be loaded, and should not be enclosed in quotation marks. The full pathname should include the device volume number, the directory path, and the file name. Note that all names are case sensitive.

Example: The hard drive volume number is 01.02. The diskette drive volume number is 01.01.

The Data Advantage loader automatically copies any application files found on a diskette to the /loads directory on the Data Advantage hard drive, with the filename in all capital letters. Therefore, to load the CAP application code in this case, the following command would be entered:

Load 01.02/loads/DACAP.SX

[Board] PORT_DIRECTION Command

Syntax:	PORT_DIRECTION <i>port_number</i> IN OUT BI OFF
Requirement:	Valid for WNI type boards only. At least one port on each board must be assigned a non-OFF direction, i.e. a direction of IN, OUT, or BI.
Default:	Ports 0 and 1 will be assigned a direction of IN, while ports 2 and 3 will be assigned a direction of OUT.
Description:	<p>This command defines the direction of message flows for a given port on the board.</p> <p><i>port_number</i> must be a value in the range 0 - 3, corresponding to port 0 through port 3 on the board.</p> <p>The direction must be one of the four possible text strings as shown above:</p> <ul style="list-style-type: none">● IN - Only input data to the Data Advantage is accepted through this port; no output data will be routed through it even if no other ports are available.● OUT - Output data may be sent through this port. However, it does not prevent the Data Advantage from accepting data received through the port.● BI - Input and output messages may be routed freely through the port, although any port that is not explicitly defined a direction will be set to a BI status.● OFF - A port that is not being used should be set to this value.
Example:	<p>Ports 1 and 2 of the current board are to be active, with port 1 to only receive messages, while port 2 may transmit and receive messages. The following commands would be entered:</p> <pre>Port_Direction 1 IN Port_Direction 2 BI Port_Direction 0 OFF Port_Direction 3 OFF</pre>

[Board] TYPE Command

Syntax:	Type CAP WNI
Requirement:	Required for all WNI boards.
Default:	The CAP board is defaulted to type CAP. All other boards must be specified.
Description:	This command defines the board's type. One of the two possible text strings shown above must be entered.
Example:	The current board is to be the CAP board. The following command would then be entered: Type CAP
Example:	The current board is to be a WNI type. The following command would then be entered: Type WNI

[EDACS_Network] Command Heading

Format: [EDACS_Network]

This heading is used to define an EDACS Network in the system.

[EDACS_Network] EDACS_IP_NETWORK_ID Command

Syntax: EDACS_IP_Network_ID *ip_network_id*

Requirement: Optional command.

Default: 172.16.0.0

Description: Assigns an IP network ID to the current EDACS Network being defined.

Each EDACS Network has associated with it a single IP network ID, with all EDACS RDTs and group RDTs assigned unique IP addresses within that network. The actual mapping of these IDs to IP addresses is defined in the table under the **[Device_Config_Table]** heading.

It is important to note that each IP address assigned to an EDACS unit or group ID must have the same network ID portion, but a unique host ID portion. The Data Advantage will use this information to build its routing tables.

ip_network_id is a 32-bit value, in an IP address format, that obeys the rules for IP network ID values.

Comments: The class of the network id defines the available IP addresses that may be assigned to units and groups on the EDACS network:
 If class A: (first octet of network ID is in range 0 - 127), the host ID portion of the address occupies the lower 24 bits.
 If class B: (first octet of network ID is in range 128 - 191), the host ID portion of the address occupies the lower 16 bits.
 If class C: (first octet of network ID is in range 192 - 223), the host ID portion of the address occupies the lower 8 bits.
 No other network classes are allowed within the Data Advantage.
 Note that the host ID bits may not be set to all ones or all zeros.

Example: A class B network ID, 150.0.0.0, is to be assigned to the EDACS Network. The following command would then be entered under the **[EDACS_Network]** heading:

EDACS_IP_Network_ID 150.0.0.0

The available addresses would then be 150.0.0.1 through 150.0.255.254 (address 150.0.0.0 would be the "all zeros" host ID case, while 150.0.255.255 would be the "all ones" host ID case, both of which are illegal).

[EDACS_Network] LABEL Command

Syntax:	Label " <i>label</i> "
Requirement:	Optional for all EDACS Networks.
Default:	A text string consisting of "EDACS_Networ".
Description:	<p>This allows a user defined text string of up to 12 case sensitive characters to be assigned to the EDACS Network. It is only referenced in messages to the terminal and in any Data Advantage generated reports.</p> <p><i>label</i> may contain any printable ASCII character, including space characters, and must be enclosed by double quotation marks. Labels need not be unique. As many characters as will fit on a single line may be entered as the <i>label</i>, but only the first twelve will be read and saved.</p>
Example:	EDACS Network is defined, but no Label command is entered for it. Its default label will be "EDACS_Networ".
Example:	<p>It is desired to assign the label "NET KEY MOUSE" to EDACS Network. The following command would then be entered under the [EDACS_Network] heading:</p> <p>Label "NET KEY MOUSE"</p> <p>However, since only the first 12 characters are saved, the actual label assigned to this EDACS Network would be "NET KEY MOUS".</p>

[IP] Command Heading

Format: [IP]

This heading's command block contains commands that are used in setting up IP specific values within the Data Advantage. Some commands are board specific, while others affect the overall Data Advantage.

Almost all [IP] commands described here are optional, with system defaults normally used in all but the more complex system configurations. See the command descriptions below and the examples given for more details.

[IP] CAP_DEFAULT_GATEWAY Command

Syntax:	CAP_Default_Gateway <i>ip_address</i>
Requirement:	Optional command.
Default:	None
Description:	<p>Defines the default gateway address to which packets will be sent if all of the following conditions are met:</p> <ul style="list-style-type: none"> ● The packet's destination address is not on the CAP's external network. ● The packet's destination address is not on the Data Advantage internal network. ● The packet's destination address is not on the CAP's routing table. <p><i>ip_address</i> is the 32-bit address value, in an IP address format, to be assigned as the default gateway. This address must exist on either the CAP's external network, or on the Data Advantage internal network.</p>
Comments:	If a default gateway is not specified, any packet that meets all the conditions listed in the description above will be discarded.
Example:	<p>The CAP's external network ID is 10.0.0.0. Any packet received by the CAP with an unknown destination is to be sent to the address 10.34.78.6 on the CAP's external network. The command entered under the [IP] heading would be:</p> <pre>CAP_Default_Gateway 10.34.78.6</pre>

[IP] CAP_EXT_ADDRESS Command

Syntax: `CAP_Ext_Address ip_address`

Requirement: Required command.

Default: None

Description: Assigns an IP address to the external (i.e. ethernet) port of the CAP.

ip_address is the 32-bit address value, in an IP address format, to be assigned as the external CAP address. The network ID portion of *ip_address* must match the ID of the network to which it is connected, while the host ID portion of *ip_address* must be a unique number on that network.

Comments: The CAP external network ID is also derived from this value, based on the network class of the address:
If class A: (first octet of network ID is in range 0 - 127), the network ID is the first octet value, followed by zeros in the remaining three octets.
If class B: (first octet of network ID is in range 128 - 191), the network ID is the first and second octet values, followed by zeros in the remaining two octets.
If class C: (first octet of network ID is in range 192 - 223), the network ID is the first, second, and third octet values, followed by a zero in the fourth octet.
No other network classes are allowed within the Data Advantage.

Example: `CAP_Ext_Address 129.039.12.6`

This command specifies that the external address assigned to the CAP is 129.039.12.6. Since this is a class B address, the CAP external network ID will be set to 129.39.0.0.

[IP] HOST_NAME Command

Syntax: **Host_Name** *name_string*

Requirement: Optional command.

Default: DA

Description: Assigns a name to the Data Advantage.

name_string is a case sensitive string of 1 to 31 alphanumeric characters, with no embedded spaces. The string should not be enclosed in quotation marks.

Example: "Division_8_DA_System_1" is to be assigned as the IP host name of the Data Advantage. The following command would be entered under the [IP] heading:

Host_Name Division_8_DA_System_1

[IP] INT_NETWORK_ID Command

Syntax:	Int_Network_ID <i>ip_network_id</i>
Requirement:	Optional command.
Default:	192.168.100.0
Description:	<p>Assigns an IP network ID to the Data Advantage internal network. All devices that communicate directly on the same network have the same unique network ID as part of their IP address. In this case, the network is the Data Advantage backplane, and the devices are the CAP and WNI boards.</p> <p><i>ip_network_id</i> is a 32-bit value, in an IP address format, that obeys the rules for IP network ID values.</p>
Example:	<p>A class C network ID, 201.0.0.0, is to be assigned to the Data Advantage internal network. The following command would then be entered under the [IP] heading:</p> <pre>Int_Network_ID 201.0.0.0</pre>

[IP] INT_BOARD_ADDRESS Command

Syntax:	Int_Board_Address <i>board_number ip_address</i>
Requirement:	Optional command.
Default:	The network ID portion of a board's address is set to the Int_Network_ID value, while the host ID portion is set to the board's number plus one.
Description:	<p>Defines the internal IP address to be assigned to each board in the Data Advantage.</p> <p><i>board_number</i> is the number of the board to which the address is to be assigned.</p> <p><i>ip_address</i> is the 32-bit address value, in an IP address format, to be assigned to the board.</p>
Comments:	<p>All internal IP addresses assigned to boards must contain the same internal network ID value. The host ID portion of the address must be within the range of allowable values as determined by the network class:</p> <p>If class A: (first octet of network ID is in range 0 - 127), the host ID portion of the address occupies the lower 24 bits.</p> <p>If class B: (first octet of network ID is in range 128 - 191), the host ID portion of the address occupies the lower 16 bits.</p> <p>If class C: (first octet of network ID is in range 192 - 223), the host ID portion of the address occupies the lower 8 bits.</p> <p>No other network classes are allowed within the Data Advantage.</p> <p>Note that the host ID bits may not be set to all ones or all zeros.</p>
Example:	<pre> Internal_Network_ID 192.16.4.0 Internal_Board_Address 1 192.16.4.1 Internal_Board_Address 2 192.16.4.8 </pre> <p>In this example, the internal network ID defines a class C network, which means that the upper 24 bits of every internal board address must be the same value, namely 192.16.4. Since only the lower 8 bits are to be used for host IDs, the addresses that may be assigned to Data Advantage boards may only be in the range 192.16.4.1 to 192.16.4.254. Addresses 192.16.4.0 and 192.16.4.255 may not be assigned to a specific device since to do so would violate IP addressing rules. Here, board 1 is assigned the address 192.16.4.1, while board 2 is assigned the address 192.16.4.8.</p>

[IP] INT_BOARD_ADDRESS Command - Continued**Example:**

All the addresses in the class C network, 197.0.0.0, are available for use within the internal Data Advantage network. There are 3 boards in the system. In this case, the internal board addresses may be used, with only the network ID specified under the **[IP]** heading:

Int_Network_ID 197.0.0.0

The following addresses would then be assigned automatically:

Board 1: 197.0.0.2

Board 2: 197.0.0.3

Board 3: 197.0.0.4

[IP] ROUTING_ADDRESS Command

Syntax:	Routing_Address <i>ip_address</i>
Requirement:	Optional command. The command is only needed when the Data Advantage's IP addresses are being set manually.
Default:	The network ID portion of the address is set to the Int_Network_ID value, while the host ID portion is set to 1.
Description:	<p>This is a unique IP address that is required by the Data Advantage in order to perform proper routing.</p> <p><i>ip_address</i> is a unique 32-bit address value, in an IP address format. It must contain the Data Advantage internal network ID, and the host ID portion of the address must be within the range of allowable values as defined by the internal subnet mask value.</p> <p>See the Int_Network_ID and Int_Board_Address commands.</p>
Example:	<p>The internal network ID is to be 210.3.2.0, which is a class C network. Only addresses 210.3.2.20 through 210.3.2.23 are available for use. There are 2 boards in the system. The following commands would be entered under the [IP] section:</p> <pre>Int_Network_ID 210.3.2.0 Routing_Address 210.3.2.20 Int_Board_Address 1 210.3.2.21 Int_Board_Address 2 210.3.2.22</pre>
Example:	<p>There are 3 boards in the system. The internal network ID is to be 210.3.2.0, which is a class C network. All addresses in the network are available for use. The following command is entered under the [IP] section:</p> <pre>Int_Network_ID 210.3.2.0</pre> <p>The Routing Address will be assigned a default IP address of 210.3.2.1. Board 1 will be assigned a default IP address of 210.3.2.2, board 2 will be assigned 210.3.2.3, and board 3 will be assigned 210.3.2.4.</p>

[System] Command Heading

Format: [System]

This heading's command block contains commands that are used in setting up global system parameters.

[System] EDACS_ERR_RETRIES Command

Syntax:	EDACS_Err_Retries <i>max_count delay</i>
Requirement:	Optional command. Its value is used to control the number of retries and the delay period between them on a case of a transmission failure.
Default:	0 for <i>max_count</i> , 0 (in tenths of a second) for <i>delay</i> .
Description:	<p>This command is used to specify the maximum number of retransmissions that a WNI board should attempt for a message when it fails to be transmitted successfully (an ACKA is received). It also delays this retransmission by a configurable amount of delay.</p> <p><i>max_count</i> is the maximum number of retransmission the WNI board should attempt from 0 to 100.</p> <p><i>delay</i> is the number of tenths of seconds in the range 0 to 1000.</p>
Example:	<p>EDACS_Err_Retry 2 40</p> <p>This command indicates that the Data Advantage should retry a failed message up to 2 times with a delay of 4 seconds between retries.</p>

[System] MAX_FTP_SESSIONS Command

Syntax:	Max_FTP_Sessions <i>session_count</i>
Requirement:	Optional command.
Default:	2
Description:	<p>This command is used to specify the maximum number of FTP sessions that may be simultaneously active in the Data Advantage from remote hosts.</p> <p><i>session_count</i> is a value in the range 0 to 4. A value of 0 indicates that no remote hosts may access the Data Advantage via FTP.</p>
Example:	<p>Max_FTP_Sessions 1</p> <p>This command indicates that only one remote host may access the Data Advantage via FTP. If a second host tries to initiate an FTP session, it will be denied.</p>

[System] MAX_MSGS Command

Syntax:	Max_Msgs <i>msg_count</i>
Requirement:	Optional command.
Default:	100
Description:	<p>This command is used to specify the maximum number of outbound messages that may be queued on a WNI. If the maximum count is reached, any new outbound messages received by that board will be discarded until the message count drops below the maximum. The Data Advantage uses this parameter to protect against running out of memory.</p> <p><i>msg_count</i> is the number of messages in the range 10 to 1000.</p>
Comments:	<p>When a message is discarded due to this maximum message count being exceeded, an ICMP "Source Quench" message is sent back to the message source.</p> <p>This command is used to fine tune the Data Advantage system performance (also see the <i>Msg_Timeout</i> command).</p> <p>If boards are running out of memory, this count should be lowered. Boards that are out of memory will continue to process messages, but in a degraded mode. Inbound messages will be discarded and fragments for partially completed outbound messages are no longer accepted.</p> <p>If the majority of outbound messages are small and are arriving at a high rate, then this value can be increased for higher throughput.</p> <p>For a dual WNI configuration, a board may reach its maximum and stop accepting new outbound messages even if the other board is not filled to capacity. The other board will continue to accept new outbound messages though.</p>
Example:	<p>Max_Msgs 200</p> <p>This command indicates that there is a maximum of 200 outbound messages that can be queued at an individual WNI.</p>

[System] MAX_TELNET_SESSIONS Command

Syntax: `Max_TELNET_Sessions session_count`

Requirement: Optional command.

Default: 2

Description: This command is used to specify the maximum number of TELNET sessions that may be simultaneously active in the Data Advantage from remote hosts.

session_count is a value in the range 0 to 4. A value of 0 indicates that no remote hosts may access the Data Advantage via TELNET.

Example: `Max_Telnet_Sessions 3`

This command indicates that only 3 remote hosts may access the Data Advantage via TELNET at the same time. If a fourth host tries initiate a TELNET session, it will be denied.

[System] MSG_TIMEOUT Command

Syntax:	Msg_Timeout <i>timeout_value</i>
<hr/>	
Requirement:	Optional command.
<hr/>	
Default:	30 seconds
<hr/>	
Description:	<p>This command specifies the maximum amount of time, in seconds, that a message may be active in the Data Advantage (on a WNI) before being discarded.</p> <p>The time-out period begins when the Data Advantage receives the first fragment of a message.</p> <p><i>timeout_value</i> is the number of seconds in the range 15 to 1000.</p>
<hr/>	
Comments:	<p>This parameter should be less than the time out value used in the Transport Layer. If the Transport Layer times out a message and resends it before the Data Advantage times out the message, both copies of the message could be queued at the Data Advantage and sent to the radio. This causes unnecessary congestion and wastes resources.</p> <p>When the Data Advantage times out a message, an ICMP "Fragment reassembly time exceeded" message is sent back to the message source if the source uses a network layer.</p> <p>If a transport layer is handling retransmissions, the following guidelines should be used to set the transport layer time-out value:</p> <ul style="list-style-type: none"> With all IP hosts, set it to a minimum of <i>timeout_value</i> plus five seconds. <p>With RDI hosts using a 45 second time-out for the ACK2 return (as defined in the RDI specification), <i>timeout_value</i> must be set to 30 seconds.</p> <p>This command is used to fine tune the Data Advantage system performance along with the Max_Msgs command.</p> <p>The "time to live" value in the IP header is not used to time-out a message since this is a hop count, rather than an actual time value.</p>
<hr/>	
Example:	<p>Msg_Timeout 40</p> <p>This command indicates that a time-out value of 40 seconds is to be applied separately to each message destined for output from a WNI. If the full message has not been transmitted 40 seconds after receiving the first fragment of the message, any and all remaining fragments will be discarded.</p>
<hr/>	

[System] TRANSPORT_LAYER_PROTOCOL Command

Syntax:	Transport_Layer_Protocol <i>protocol_type_code</i>
Requirement:	Optional command. Its value is referenced only when non-network layer RDTs are being used.
Default:	17, which is the protocol type code for UDP IP packets.
Description:	<p>When non-network layer RDTs are used, the message arrives at the WNI, from the RDT, with no IP header. However, all messages that pass through the Data Advantage must have an IP header, which the WNI will create in this situation. One of the fields in this header is the protocol type code field. The value defined by this command is the value placed in that field by the WNI.</p> <p><i>protocol_type_code</i> is a value in the range 0 to 255. There are many standard protocol type codes defined, including the following:</p> <ul style="list-style-type: none">1 ICMP6 TCP8 EGP17 UDP
Example:	Transport_Layer_Protocol 6 <p>This command indicates that the TCP protocol type code will be placed in the IP header created by the WNI when non-network layer RDTs are in use.</p>

[Device_Config_Table] Table Heading

Format: [Device_Config_Table]

This heading precedes a table of entries that will configure characteristics for a number of different devices. One such function is to map various types of EDACS IDs to IP addresses. The Data Advantage requires a unique IP address to be mapped to every radio and group ID involved in data communications. This is necessary since every network data message sent through the Data Advantage must have a source IP address, identifying the message sender, and a destination IP address, identifying the desired recipient. The source address allows the recipient to respond back to the sender, while the destination address is used to provide the correct routing through the Data Advantage and any external IP networks. The device will also be designated as using a network layer or not. Another function is to map a WNI port to a host. Each WNI port may be mapped to an IP host to allow non-network layer RDTs to communicate with IP hosts.

There are no commands associated with this heading, only one or more single line entries. The entry format is described below.

[Device_Config_Table] Entry**Entry Syntax:**

id_type id_range start_ip_address network_layer

Description:

Each entry in this table maps either a single EDACS ID, a block of EDACS IDs or a WNI port to a single IP address or block of IP addresses, respectively. There is no limit to the number of entries that may be placed in this table, i.e. every possible EDACS ID and WNI port may be assigned to a separate entry. Each entry consists of three required fields.

id_type consists of a string identifying the type of EDACS ID or WNI port being mapped. Valid values include:

- **RDT** - EDACS Radio Data Terminal ID
- **RDT_group** - EDACS Radio Data Terminal group ID
- **port** - WNI Port. Designates a WNI Board Port Host to IP mapping for non-network layer radios.

1 - *id_range* is a single ID or range of IDs or locations to be mapped to a single IP address or range of IP addresses, respectively. A range is entered in the form:
start_id - end_id

RDT IDs may be in the range 64 - 16382. Group IDs may be in the range 1 -2047. For Ports, the first digit is the board number ranging from 2 -3, and the second digit is the port number ranging from 0 - 3. Hence, port numbers may range from 20-23 and 30-33. Note the range 30-33 is only allowed when two WNI boards are present.

start_ip_address is a single value in IP address format. If the preceding *id_range* field is a single value, then *start_ip_address* is the IP address assigned to the ID value. If, instead, *id_range* is a range of values, then *start_ip_address* identifies the beginning of a contiguous block of addresses to be assigned to the IDs.

network_layer is an optional Boolean value. The device must specify FALSE if it does not use the network layer. The device defaults to use the network layer, or the user may specify TRUE if he wishes to do so. Ports should not have an entry for this field.

[Device_Config_Table] Entry - Continued

Requirement: Optional.

Default: If RDT or RDT_group entries are not entered:
 RDT entry records will be generated for all units from 64 to 16382. The *start_ip_address* is Host ID 0.64 on the EDACS IP Network.
 RDT group entry records will be generated for groups 1 to 2047. The *start_ip_address* is Host ID 64.0 on the EDACS IP Network.
 A port entry record is optional.
Network_layer defaults to TRUE for the Data Advantage.

Example: The following IP mapping must be performed:

- RDT ID 1000 is to be assigned address 130.2.0.1 and be a non-network layer device.
- RDT IDs 5000 - 9999 are to be assigned a block of IP addresses beginning at 130.2.1.0.
- All EDACS RDT group IDs (1 - 2047) are to be assigned a block of IP addresses beginning at 130.2.192.0 and default to use the network layer header.
- Board 2 Port 0 is to be assigned IP addresses 178.2.0.1
- Board 3 Port 1 is to be assigned IP addresses 178.2.0.1
- Board 3 Port 2 is to be assigned IP addresses 178.2.0.2

The table would then appear as follows:

[Device_Config_Table]				
RDT	1000	130.2.0.1	FALSE	# Special RDT
RDT	5000-9999	130.2.1.0	TRUE	# All other RDTs
RDT_group	1-2047	130.2.192.0		# All possible RDT group IDs
port	20	178.2.0.1		# Board 2 Port 0
port	31	178.2.0.1		# Board 3 Port 1
port	32	178.2.0.2		# Board 3 Port 2

[IP_CAP_Ext_Routing_Table] Table Heading

Format: [IP_CAP_Ext_Routing_Table]

This heading precedes a table of entries that make up the external routing table for the CAP board. Each entry in the table defines the correct routing for any messages destined for an external host that is not on the CAP's local external network, i.e. the host's network ID is not the same as the CAP external network ID.

There are no commands associated with this heading, only one or more single line entries. These entries are concatenated to the CAP's internal routing table, which is built automatically at startup. The entry format is described below.

NOTE

The total number of entries in the CAP's routing table, which consists of the external entries defined here, plus the number of CAP internal routing table entries, plus any CAP default gateway entry, may not exceed 1024.

The number of CAP internal routing table entries will be equal to at least four (one each for the Data Advantage backplane Network Interface (NI), the foreplane NI, the loopback address 127.0.0.1, and the EDACS Network.)

[IP_CAP_Ext_Routing_Table] Entry**Entry Syntax:**

HOST | NET *destination_address next_gateway*

Description:

The *destination_address* type is specified using one of the two values shown above. If it refers to an individual destination, the HOST keyword should be specified. If it refers to a network, the NET keyword should be specified.

destination_address is the IP address of an external host or an external network that is not on the CAP's local external network or part of the CAP's external subnet, but can be reached via a gateway, that is on the CAP's local external network.

next_gateway is the IP address of a host that is on the CAP's local external network through which messages may be routed to reach a destination on another network. Note that any *next_gateway* address must contain the same network ID as that of the CAP external address.

[IP_CAP_Ext_Routing_Table] Entry: *Continued*

Requirement: Optional.

Default: No Additional routes defined.

Example: The CAP's external network ID is 10.0.0.0. A gateway with address 10.4.3.2 exists on this network through which the network 144.6.0.0 may be reached. Another gateway with address 10.20.2.79 exists on this network through which the single host device 6.1.1.16 may be reached. The table would then appear as follows:

[IP_CAP_Ext_Routing_Table]
NET 144.6.0.0 10.4.3.2
HOST 6.1.1.16 10.20.2.79
