

# **DCX EMC Module Reference Manual**

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## STATUTORY NOTICES



Case Technology Ltd declare that this product conforms with the protection requirements of Council Directive 89/336/EEC on the approximation of the laws of the member states relating to electromagnetic protection.

### WARNING

The DCX 860 and 870 incorporate a panel in front of the plug-in modules. This panel may only be removed by suitably qualified personnel for installation or maintenance purposes, and must be replaced afterwards. Removal under any other circumstance would invalidate any RFI (Radio Frequency Interference) and Safety Type Approvals.

### LITHIUM BATTERY

The lithium used in the battery of this unit will react violently with water and most gases. Discharged batteries must not be crushed, incinerated or disposed of in the normal waste. Used batteries should be collected and disposed of in an approved land fill. The manufacturer and your local waste authority will provide more detailed information about their disposal.

Accidental charging and short circuiting of the battery may cause overheating and possible rupture.

Replace only with the same or equivalent type recommended by the equipment supplier.

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# Preface

This manual provides full information for relevant personnel to install, configure and use the DCX EMC module.

## Terms and Conventions

The following terms have been used in this manual:

Supervisor	is the person performing a supervisory or management function.
Manager	is the software module in the EMC used to configure and control it.
Manager Station	is the terminal connected to the EMC Manager.



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## 1.1 The EMC Module

The EMC module performs Event Management and Concentration functions. It is a single card which fits into any free high speed device slot in a DCX 850, DCX 860, or DCX 870. It allows Event Log messages to be collected from all devices capable of generating them and routed either locally or to a central collection device or both. As subsidiary functions, it can convert link statistics Event Log messages into a readable format for the user, and accept and pass on USO and System Module trap dumps.

### 1.1.1 EMC Specification Summary

Minimum size of device	:	5
Maximum size of device	:	24
Maximum number of independent input channels	:	20
Number of independent output channels	:	3
Number of physical ports mappable to output channels	:	1
Downstream devices supported	:	System Module USO NCAM EMC Ethergate OSIgate 844
Upstream protocols supported	:	NMC 5450 Null (RAW)
Event Log Mode	:	ASCII message Binary records

## **1.1.2 EMC Features**

The main features of the EMC are:

### **Input Channels**

- Collection of Event Log messages in either ASCII or binary form.
- Independent mapping to any or all output channels.
- In-band flow control of downstream devices.
- Heartbeat monitoring of downstream EMCs.

### **Output Channels**

- Transmission of Event Log messages in either ASCII or binary form.
- Enabling/disabling of Event Log message handling.
- Enabling/disabling of Link Statistics handling.
- Enabling/disabling of USO/System Module trap dump handling.
- Imposition of parity on generated data.
- Selection of protocol on output stream.
- Filtering of output Event Log messages.
- Transmission of EMC's own Event Log messages.
- In-band flow control by upstream devices.
- Ability to map to physical port.

### **Management**

- Password protected Manager.
- Cold and warm start facility.
- Load and dump facility.
- Control of heartbeat interval for the EMC.
- Configuration of physical port.
- System status display.

## **1.2 General Operation**

The EMC can handle up to 20 input channels (the precise number being four less than the device size allocated to the EMC). These are relative channels 5 upwards. Each of these input channels can service one downstream device. These devices can be anything that generates DCX Event Log messages (e.g. USO, System Module, NCAM, another EMC etc.). The EMC input channel and its supply device should be connected with an IMP or a PMC. Each of the input channels can operate in either ASCII or binary Event Log mode and can be configured to flow-control its supplying device.

The EMC has three output channels, any one of which can be directed to the physical port, if required. These are relative channels 2, 3 and 4. Each of these output channels can service one upstream device. These devices can be anything that can handle DCX Event Log messages, link statistics displays and USO/System Module trap dumps (e.g. NMCs, printers, another EMC etc.). The EMC output channel and its receiving device should be connected with an IMP or a PMC. Each of the output channels can operate in either ASCII or binary Event Log mode and can be configured to be flow-controlled by its associated device.

Each of the input channels can independently be directed to none, any, or all of the output channels. This feature, together with the ability to apply independent filters on each of the output channels, allows the EMC to split or concentrate Event Log streams.

The EMC incorporates a Manager which allows a Supervisor to configure and control the EMC. The Manager is accessed via relative channel 1.



### 2.1 Functional Description

The EMC is a microprocessor-based module hosted on the standard utility 2 card (level 12 or higher). It interfaces with the rest of the DCX environment via the backplane bus as shown in Figure 2-1. The major functional units comprising the EMC are described in the following paragraphs.

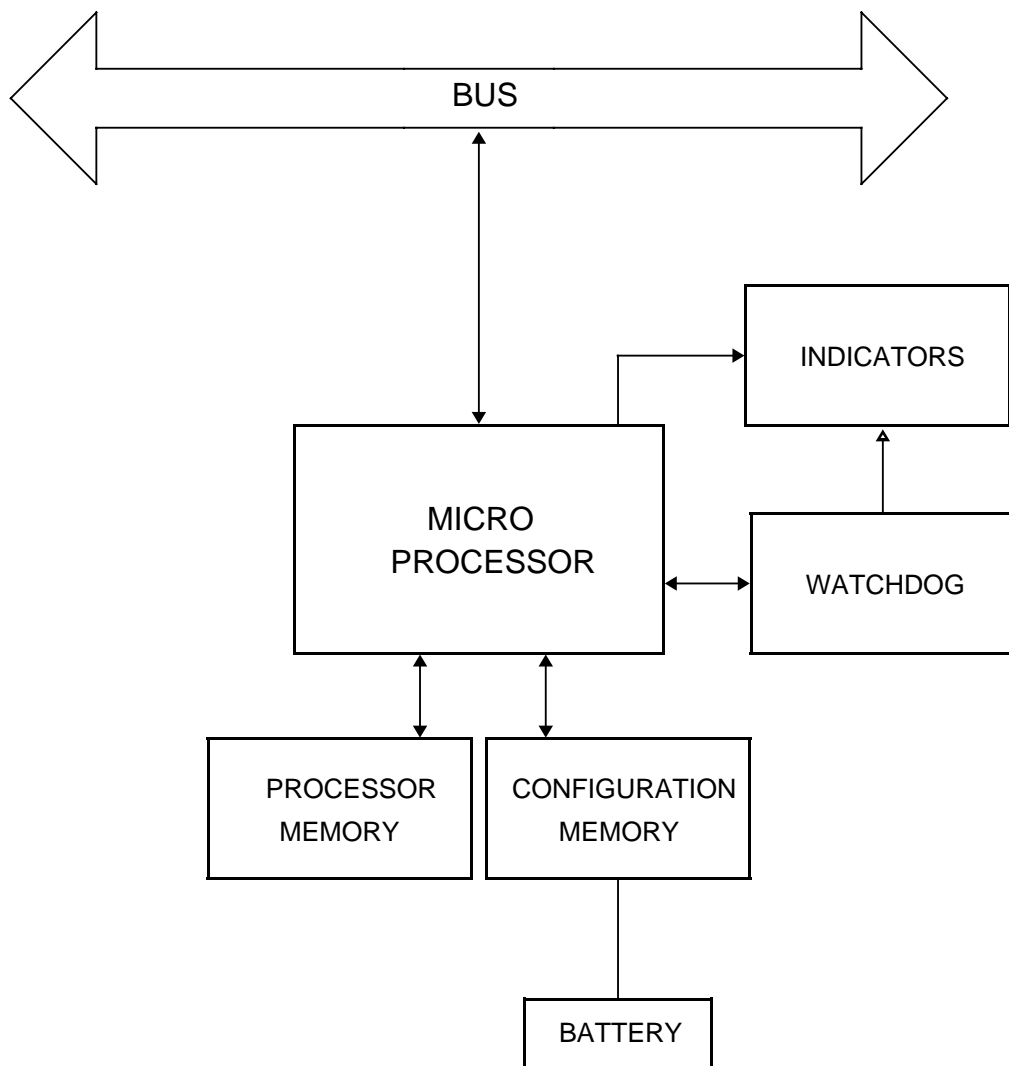


Figure 2-1 EMC Simplified Block Diagram

## **Watchdog Timer**

This watchdog monitors the processor for malfunctions, forcing a processor reset if necessary.

## **Configuration Memory and Battery**

In the EMC is a special area of memory which holds what is known as the 'EMC Configuration' data. This consists of information such as input and output channel configurations. It is powered by a lithium battery that ensures the information is retained even when the EMC has no external power applied.

## **Processor Memory**

The processor memory holds the program instructions which control the microprocessor, and provides random access memory for use as formal data structures and temporary work areas.

## 2.2 Physical Description

The EMC consists of one standard size DCX card occupying a single slot in the DCX master frame. There are 9 LED indicators on the front panel of the EMC. These are used to indicate the state of normal operation and to report problems by displaying software traps. The indicators are as shown in Figure 2-2.



**Figure 2-2 EMC LED Indicators**

## Indicators

- OK** This LED is directly controlled by the watchdog timer monitoring the EMC software. If a regular pulse is not received, the LED is extinguished. In normal operation, this LED should be lit.
- T** Trap. When this LED is lit, the EMC has detected an error condition and has ceased to function. The LEDs below the T cease to have their normal meanings and are used to indicate which error condition has been detected (see Appendix A). When the T LED is not lit, the other indicators have their normal meaning.
- MAN** Manager. This LED is lit when the Manager is in use.
- DTR** Data Terminal Ready. This LED is lit when DTR has been detected on the Manager channel – i.e. there is a Manager Station connected.
- DNG** Danger. This LED is lit when the EMC's available working memory is low. When in a danger condition, the EMC may have to discard Event Log messages arriving at the input channels. When the memory level rises above the danger threshold, this LED will be extinguished.
- CUS** Configuration Unsuitable. This LED is lit if the device size allocated to the EMC is unsuitable, i.e. it is either less than 5 or more than 24. The EMC will not operate in this situation.
- TxD** Transmit Data. This LED is lit when data is being transmitted on any of the output channels and so in normal operation, this LED will flash frequently.
- RxD** Receive Data. This LED is lit when data is being received on any of the input channels and so in normal operation, this LED will flash frequently.
- ENB** Enabled. When the EMC is operating normally, this LED will flash on and off at 1 second intervals.

Installation should only be carried out by suitably qualified engineers.

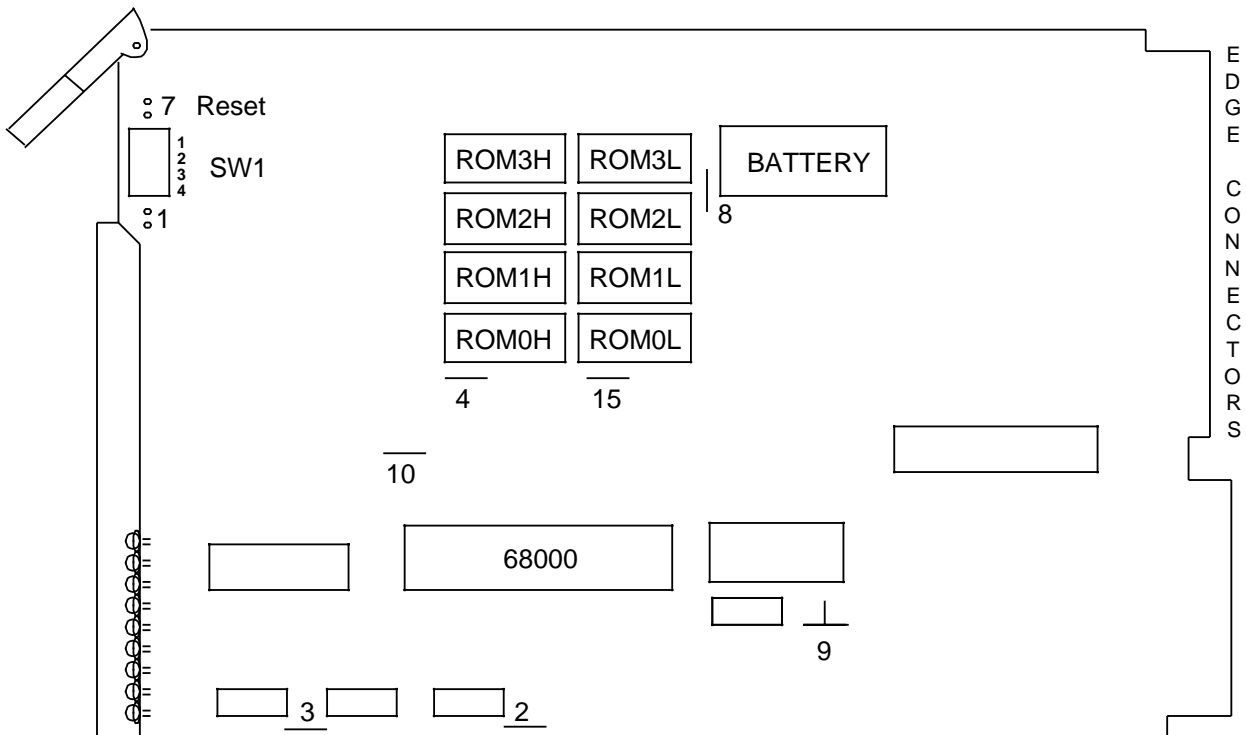
Installation should take place in the sequence of instructions in this chapter.

There are option straps on the card. They should be set as shown in Table 3-1. Note that if the card is to be stored and the configuration will not be required again, strap 8 should be disconnected (down) to prevent unnecessary drain on the battery.

### 3.1 EMC Option Switches and Straps

The card layout showing the location of the switches and straps is shown in Figure 3-1.

The DIP switches on SW1 are not used and should therefore not be altered from their factory default setting (closed).



**Figure 3-1 EMC Switches and Straps**

STRAP NUMBER	STRAP NAME	NORMAL OPERATIONAL SETTING	
		SETTING	STRAP POSITION
1	SFINT	ENABLED	NO STRAP
2	(PROM Size)	OTHER	STRAP RIGHT
3	WDOG	ENABLED	STRAP ON
4	BERR	ENABLED	STRAP ON
7	RESET	ENABLED	NO STRAP
8	(Battery supply)	CONNECTED	STRAP UP
9	RAM/128K/OTHER	OTHER	STRAP UP
10	BDS/BAS	BAS	STRAP RIGHT
15	512K/OTHER	OTHER	STRAP RIGHT

Note that strap names shown in brackets are not marked on the card

**Table 3-1 EMC Strap States**

## **3.3 Installation Procedure**

### **Fitting the Card**

**WARNING:** For installation in DCX 860 and 870 see page 0-2.

1. Turn off the mains power to the DCX frame.
2. Insert the EMC card into any free high speed device slot in the frame.
3. Turn on the mains power to the DCX frame.

### **Configuring the DCX**

Once you have inserted the EMC module into the frame you are ready to configure the DCX.

1. Ensure that the EMC is allocated an appropriate device number and size (the EMC takes its device number from the slot in which it is placed in the same way, for example, as ARQs). The device size allocated must be between 5 and 24 (inclusive).
2. Define an UMP port on the first channel of the EMC device. This is the Manager channel. It is recommended that you specify a connection event of 3 and a disconnection event of 0. The DTR test should be inhibited as should System Messages.
3. If the local USO/System Module Event Log is to be routed into the EMC, define an UMP port for it on one of the input channels and define IMP ports or PMCs on all the other input and output channels. If the local USO/System Module Event Log is not to be routed to the EMC, define IMP ports or PMCs on all the input and output channels. The DTR tests should be inhibited.
4. Establish the IMPs or PMCs for the input and output channels to the selected downstream and upstream devices. If the local USO/System Module Event Log is to be routed to the EMC, configure the Event Log port on the UMP port created for it in step 3.
5. Use the Manager Station to connect to the Manager (the default password is <CR>). Use the PASSWORD command to set the Manager password (see Section 4.3.16).
6. Use the HEARTBEAT command to set or disable the heartbeat interval depending on whether or not there are any downstream EMCs to be checked (see Section 4.3.7).

7. Use the INPUTS command to configure each of the input channels appropriately to its downstream device and according to which output channel(s) it is to be directed (see Section 4.3.9).
8. Use the OUTPUTS command to configure each of the output channels appropriately to its upstream device (see Section 4.3.15).
9. Logoff from the EMC Manager (see Section 4.3.12).
10. Check out the EMC by generating Event Log messages on each of the input streams and confirm that they are output in the correct output streams.

This chapter lists the commands that can be carried out by the Supervisor at a Manager Station.

These commands enable you to define, display and modify details of the configuration of the EMC at which the Manager Station is logged-on.

## **4.1 Manager Interface**

The Manager Interface provided by the EMC is a user friendly screen-based system. It provides the Supervisor with an easy to use environment for the configuration of the operational parameters of the EMC.

Because it is screen-based, it is a requirement that the terminal to be used for that procedure must conform to the addressing and formatting conventions defined by the ANSI standard. The most well known of such terminals is the DEC VT100, but many terminals and most PC-based terminal emulators can be configured to operate in this mode. The VT100 has four function keys, and for this Interface all four of these have been used. An alternative means of producing a function key press has been provided in the event that a particular terminal or emulator has no function keys at all.

The Manager provides extensive on-line help. This is context sensitive and may be requested at any time.

Interaction with the Manager may take place in one of three ways:

### **(1) Using the prompt line**

This is used to control the EMC, change the setting of soft switches and configure simple items by entering the appropriate command. Some operations may consist of just the command, such as logging-off the Manager Station. Other operations may prompt for additional data, such as the HEARTBEAT command, or prompt for confirmation such as the WARM command.

## **(2) Using forms**

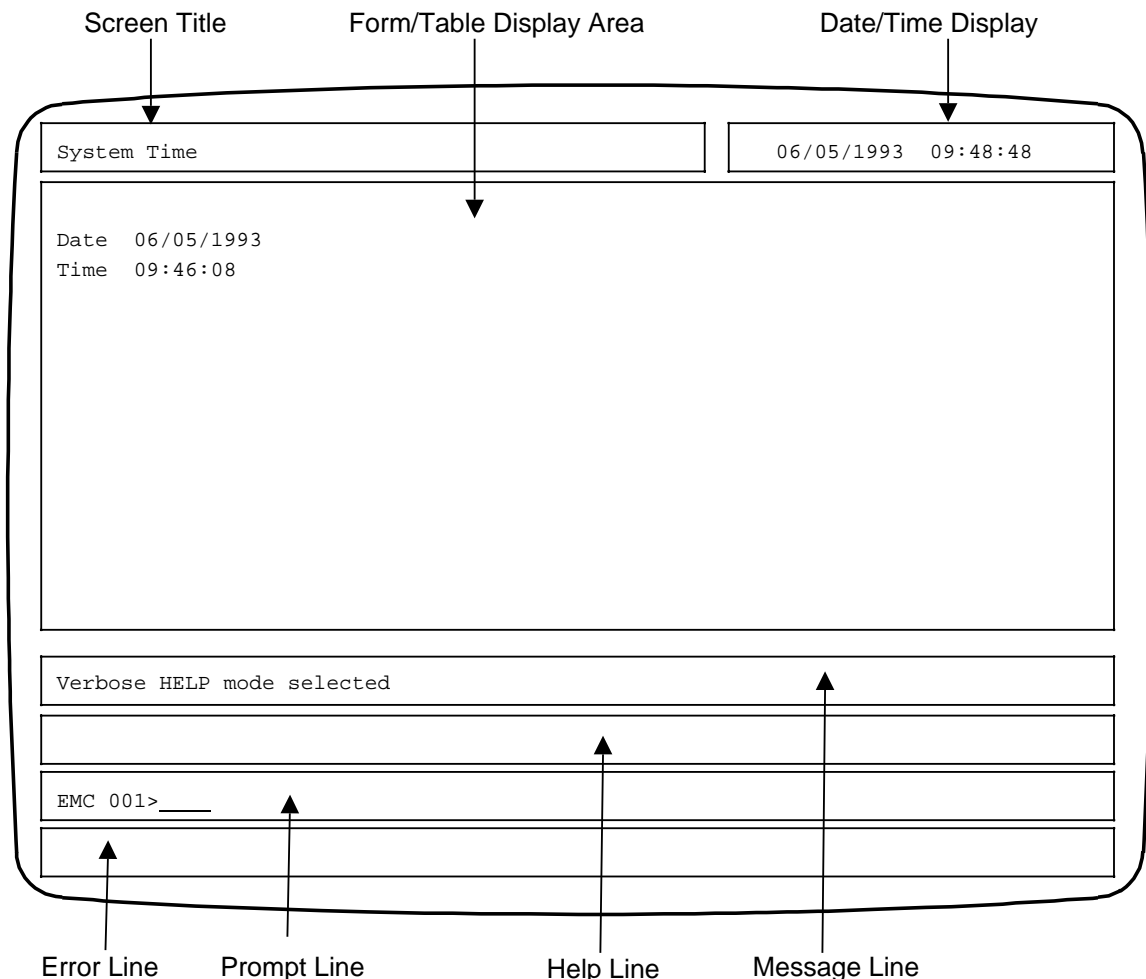
Forms are entered by invoking the appropriate command at the prompt line. They are used to configure parameters with a single value, for example, a password, or parameters consisting of a number of different values such as the time. The information presented by a form will always fit on the screen.

## **(3) Using tables**

Tables are entered by invoking the appropriate command at the prompt line. They are used to configure parameters which have many examples of a similar type, such as input/output channels. They are also used to display information which will not fit on the screen as a single display.

## 4.1.1 Manager Display

The following screen is used to highlight the various areas on the display. Note that this is a demonstration display only, and would not be observed in this form on a working EMC.



## 4.1.2 Using Forms and Tables

Operations on Forms and Tables are the same. However, since Tables can handle more information than can be displayed, the screen is used as a 'window' on the table. The display 'window' can be moved, allowing the entire table to be accessed.

Forms consist of a number of fields, with each one holding a specific piece of data. Tables consist of many similar items, with each item consisting of a number of fields. Normally an item will occupy a single line, such as a channel.

## IMPORTANT NOTE

Forms and Tables operate on copies of the EMC configuration. They do not operate directly on the EMC configuration. The changes made using Forms and Tables do not replace the EMC configuration until the 'Submit Data' key is pressed (see below) and the operation confirmed.

Movement around forms and tables is achieved using pre-defined keys and sequences. The operation of these keys may be modified at times where its normal mode of working would be inappropriate. The cursor motion keys fall into this category.

### Keystroke Conventions

Non-literal characters are shown in angle brackets. For example, <CR> means the RETURN or ENTER key. Control characters are similar. For example, <CTRL C> means hold down the CONTROL key while pressing C.

Function keys are shown in full. For example, <PF1> means press the PF1 key.

- **Moving the display 'window'** (Tables only)

#### **Next Page <CTRL F>**

If a given table is too large to fit on a single screen (e.g. input channel table) press this key to move the cursor forward one screen. Note that the position of the cursor on the screen does not vary, only the position of the 'window' within the table. If the screen is already displaying the end of a table, then it has no effect.

#### **Previous Page <CTRL B>**

This key works in exactly the same way as Next Page <CTRL F>, except the cursor is moved to the previous page.

- **Movement within the screen**

#### **Next Field <CR>**

This key moves the cursor to the next field. The current field will be validated first if the data has been changed. If the field is invalid, an error will be displayed and the cursor re-positioned to the start of the field in error.

### **First Field <CTRL L>**

This key moves the cursor to the first field of a form, or current line in a table.

This key has additional functionality in tables. If the cursor is already at the first field in a table entry, pressing <CTRL L> will result in the cursor moving to the first field on the screen. If the cursor is already at the first field on the screen, pressing <CTRL L> will result in the cursor moving to the first field in the table, re-painting the screen as necessary.

### **Last Field <CTRL E>**

This key works in exactly the same way as <CTRL L> First Field except the cursor is moved to the last field of a form or current line in a table.

### **Cursor Keys**

The arrow keys allow you to move the cursor around the fields displayed. Note that the cursor will only move to fields appropriate to the current mode of working.

- **Data modification**

#### **Delete Previous <BACKSPACE>**

This key deletes the character before the cursor. All subsequent characters are shifted one place left.

#### **Delete Current <DELETE>**

This key deletes the character under the cursor. All subsequent characters are shifted one place left.

#### **Restore Field <CTRL R>**

This key restores the original contents of a field that has been altered, but ONLY while the cursor remains in the field. Once the cursor has been moved to another field the local copy of the data has been updated.

#### **Constrained Set Operations < and >**

The constrained set operators < and > are used to select an option from a list which is pre-defined. The > operator advances through the options in a forward direction and the < operator in the reverse

direction. It is not apparent looking at a given field whether it is a constrained set or not, but some obvious ones include the YES/NO at the end of prompts, and the channel control parameters for flow control, parity etc. Although a field may be a constrained set, this does not prevent the Supervisor from typing the value instead of using the constrained set operators. The field validation function knows the correct values of constrained set data and will validate typed values.

### **Delete Item <CTRL D>**

This key is only appropriate for tables. It is used to delete an item from a table. To use this key, simply position the cursor to any field in the item to be deleted and press <CTRL D>. To prevent items being deleted by accident the Manager will prompt for confirmation to delete. Toggle NO to YES using one of the constrained set operators and press <CR>.

### **Insert Item <CTRL O>A and <CTRL O>B**

These sequences are used to insert items into a table. The <CTRL O>A inserts the item after the current item, whilst the <CTRL O>B inserts before the current item (i.e. where the cursor is located). In many cases these keys may be used interchangeably, since the items are sorted once entered, meaning that the position of the insert is irrelevant. Invoking one of the Insert operators causes the current item to be validated.

- **Exiting Forms and Tables**

### **Submit Data <CTRL G>**

This key tells the Manager that the data on the screen is complete. It invites the Manager to validate the data contained on the screen and to update the system configuration accordingly. In the event that no errors are detected in the data to be submitted, the submission of the form would overwrite system configuration. Since this is potentially dangerous, a confirmation request is made. The NO/YES at the end of the prompt is a constrained set. Once the desired value is achieved, simply pressing <CR> will complete the operation and the system will be updated.

### **Abort Operation <CTRL C>**

This key is the global abort key. You can usually abort any operation by pressing this key. If no changes have been made the system simply returns to the prompt. If changes are detected, a message is output

stating that changes will be discarded and requesting confirmation. The NO/YES at the end of the prompt is a constrained set. Once the desired value is achieved, simply pressing <CR> will complete the operation.

### **Function Keys <PF1> to <PF4>**

These keys have different functions depending on the form or table in which they are invoked. The detailed Help for a given command will explain the action, if any, of the function keys. For example, in the FILTER command <PF1> is used to clear out the contents of the description field. On the MESSAGE command <PF2> is used to display the full text. Quite complex operations are available using the function keys. For terminals that have no function keys, these are emulated using the key sequences <CTRL A>1 to <CTRL A>4.

- **Context Sensitive Help or ?**

On the prompt line, the word 'HELP' or '?' may be used interchangeably. 'HELP' or '?' on their own result in a display of the commands that are valid. If a parameter is provided to the HELP command, then this is used to request detailed help on one or more commands. For example, if you type HELP<SP>T, the Manager will display detailed help on all commands beginning with T, i.e. TEXT, TIME etc. HELP<SP> \* gives detailed help on all commands.

Within a form or table, help can be requested at any stage by pressing '?'. Help for the particular parameter under the cursor will be displayed on the Help Line.

- **Verbose Help**

It is possible using the VERBOSE command to enable verbose Help. This results in the help line being displayed, the same as if the '?' key been pressed in that field. This means that as you move between fields the Help relevant to that field is automatically displayed.

## 4.2 Command Syntax

The sequence in which you press keys to enter commands should follow the instructions in this section.

Non-literals are shown in angle brackets, e.g. <CR> means the RETURN key.

Compulsory spaces shown as <SP> must be entered where shown (although in some places additional spaces may be entered without producing an error, as they are ignored by the Manager).

When a command has to be entered, the minimum number of characters required is underlined in the text. More than the minimum characters may be entered, for example:

for TIME enter Tl or TIM or TIME

Options within commands are shown in square brackets [ ], for example:

BE [<SP>I]

The entire contents of the square brackets must be entered or omitted.

Commands may be entered in upper case, lower case or mixed case.

## 4.3 Commands

This section explains the commands available to the Supervisor. Here is a summary list of all the commands and their functions:

<u>BEEP</u>	Enable/inhibit the Manager bell character.
<u>CLS</u>	Clear the screen display area.
<u>COLD</u>	Perform a cold restart.
<u>DEVICE</u>	Define a DCX device.
<u>DUMP</u>	Perform a configuration dump.
<u>FILTER</u>	Define a message filter.
<u>HEARTBEAT</u>	Define system-wide heartbeat interval.
<u>HELP</u>	Obtain general and command help.
<u>INPUTS</u>	Configure the input channels.
<u>KEY</u>	Display key interpretations.
<u>LOAD</u>	Perform a configuration load.
<u>LOGOFF</u>	Terminate the Manager session.
<u>MESSAGE</u>	Define a new DCX event log message.
<u>NODE</u>	Set EMC node number.
<u>OUTPUTS</u>	Configure the output channels.
<u>PASSWORD</u>	Change the Manager password.
<u>PHYSICAL</u>	Configure the physical port.
<u>STATUS</u>	Display system status information.
<u>TEXT</u>	Define text strings for a new DCX event log message.
<u>TIME</u>	Set EMC system time.
<u>TRAP</u>	Suppress the trap indication displayed on Manager logon.
<u>VERBOSE</u>	Enable/inhibit verbose help.
<u>WARM</u>	Perform a warm restart.

The command may be entered in either the full form or the shortened form (shown underlined), followed by a space, followed by any relevant parameter, followed by return.

### 4.3.1 BEEP

Under certain circumstances, typically when it has detected an error condition, the Manager will cause the Manager Station bell to ring. Some supervisors may find this irritating, so this command is provided to enable or inhibit the bell.

```
BEEP [<SP>E] <CR>  
      [<SP>I]
```

### 4.3.2 CLS

This command causes the screen to be cleared.

CLS <CR>

### 4.3.3 COLD

This command is used to perform a cold start of the EMC.

COLD <CR>

When you issue this command, you will be prompted to confirm the request. If you do so, the EMC will restart with default configuration.

### 4.3.4 DEVICE

This command allows you to define DCX devices that are capable of generating Event Log messages. It is used in conjunction with the MESSAGE and TEXT commands when defining new Event Log messages.

DEVICE <CR>

For each device the following are defined:

Name (Free-form alphanumeric)

This is the name of the device (e.g. USO, OSigate etc).

Identifier (the integer)

This is the hex number that internally defines the device. It is in the range F0 to FF. (Cray will supply this information if required.)

### 4.3.5 DUMP

This command causes a dump of the EMC configuration data to be sent out on the Manager channel.

DUMP <CR>

When you issue this command it will request you to prepare the dump device and confirm when you have done so. When it receives the confirmation it will send the dump. Press <CTRL C> to abort the dump.

Possible errors:

- Dump timeout – the dump device was not prepared quickly enough.
- Dump aborted – Supervisor pressed <CTRL C>.

### 4.3.6 FILTER

This command allows you to define a message filter.

FILTER <CR>

For each filter the following are defined:

Name (Free-form alphanumeric)

This is the name by which you wish to call the filter.

Description (Free-form alphanumeric)

This is the description you wish to associate with the filter.

Pressing <PF1> when in the description field will clear it.

Pressing <PF2> when in the name field will display the setting of the filter. The display of the filter consists of a list of all message indexes with an asterisk marking all those which are selected.

Pressing <PF3> when in a message field within the filter setting display causes the selection to be toggled.

To return to the main filter screen from the filter setting display, press <CTRL C> or <CTRL G>. Note that either of these simply makes the return – the decision concerning submitting or quitting comes only when the whole command is terminated.

### 4.3.7 HEARTBEAT

This command allows you to specify the heartbeat interval in seconds. This is the interval at which the presence of downstream EMCs can be checked. Note that the input channel on which the downstream EMC exists must have heartbeat enabled.

The interval should be in the range 0 to 999. A value of 0 will disable the heartbeat facility on a system-wide basis.

HEARTBEAT <SP> *interval* <CR>

Possible errors:

Bad interval [*i*] – heartbeat interval should be in the range 0 to 999. (Where *i* is the interval specified.)

### 4.3.8 HELP

This command is used to get general or command-specific help.

```
HELP [<SP> command] <CR>
```

Possible errors:

No help available – Command does not exist.

### 4.3.9 INPUTS

This command allows you to configure the input channels. When you enter the command, a table is displayed that shows the configuration of all the input channels.

```
INPOTS [<SP> start channel] <CR>
```

For each input channel, the following parameters are defined:

Operating mode (Constrained list : CLOSED/ASCII/BINARY).

If the channel is closed, data arriving at the channel will be discarded. If it is in either ASCII or binary mode, the EMC will attempt to interpret the arriving data as either an ASCII or binary Event Log message respectively.

Route to output channel 1 (Constrained list: YES/NO)

This parameter determines whether or not Event Log messages accepted on the input channel will be passed to the first output channel.

Route to output channel 2 (Constrained list: YES/NO)

This parameter determines whether or not Event Log messages accepted on the input channel will be passed to the second output channel.

Route to output channel 3 (Constrained list: YES/NO)

This parameter determines whether or not Event Log messages accepted on the input channel will be passed to the third output channel.

Flow control (Constrained list: NONE/DC1-DC2/DC1-DC3)

This parameter determines what form of flow control (if any) will be used to control the downstream device on the channel.

Heartbeat enabled (Constrained list: YES/NO)

This parameter determines whether or not a heartbeat pulse will

be sent out on the channel at the interval defined by the HEARTBEAT command.

Note that if an input channel operating mode is closed, all the other parameters are irrelevant and they will be blanked out on the screen and the cursor will not visit them.

The optional input parameter defines the 'start' channel on which the cursor will initially be placed.

Possible errors:

- Bad channel [c] – start channel should be in the range 1 to n. (Where c is the channel specified and n is the number of input channels on the EMC.)

#### **4.3.10 KEY**

This command is used to display the keys that are used to move around the forms and tables.

KEY <CR>

#### **4.3.11 LOAD**

This command causes previously dumped EMC configuration data\* to be read in on the Manager channel.

LOAD <CR>

When you issue this command the Manager will request you to prepare the dump device and confirm when you have done so. When it receives the confirmation it will accept the LOAD command. Press <CTRL C> to abort the load.

- \* Note that the loader synchronises on the colon at the start of the first dump line. If the dump that is about to be loaded was obtained by capturing the result of a DUMP command, it may contain time output with colon separators. These should be edited out prior to loading.

Possible errors:

- Load timeout – no data arrived at the EMC.
- Load aborted – Supervisor pressed <CTRL C>.
- Invalid data format – the data supplied is not an EMC dump.
- Checksum error – the data supplied was corrupt.

### **4.3.12 LOGOFF**

This command will terminate the Manager session.

LOGOFF <CR>

### **4.3.13 MESSAGE**

This command allows you to define new Event Log messages for the EMC to recognise. It is used in conjunction with the DEVICE and TEXT commands.

MESSAGE <CR>

For each message the following are defined:

Index (Integer)

This is the index number that internally defines the message.

Device (Constrained list made up from devices defined by the DEVICE command)

This is the device that generates the message.

Follow-up (Constrained list NONE/COUNT/USERID)

This is the indicator of what form of follow-up message accompanies the message when operating in binary mode. The choices are: no message, a character count or a user ID.

Display (Integer)

This is the number of the message when it is displayed in the FILTER command.

Major (Constrained list. YES/NO)

This defines whether the message has the three bell characters and five space indentation that goes with a major message.

Text (Free-form alphanumeric)

This is the text proforma that defines the shape of the new message when operating in ASCII mode.

Note that Cray will supply all this information if required.

Pressing <PF1> when in the text field will clear it.

Pressing <PF2> when in the text field will cause the full text to be displayed at the bottom of the screen where it can be edited.

#### Possible errors:

- There are no DCX devices defined – Since a message requires a device associated with it, the command cannot proceed if none are defined.

#### 4.3.14 NODE

This command allows you to configure the EMC node number in the range 1 to 255. The node number is used for communication with an NMC so, if none of the output channels have NMC protocol configured, the node number is unnecessary.

The node number is also displayed as part of the command prompt.

```
NODE <SP> node number <CR>
```

#### Possible errors:

- Bad node number [*n*] – node number should be in range 1 to 255. (Where *n* is the node number specified.)

#### 4.3.15 OUTPUTS

This command allows you to configure the output channels. When you enter the command, a table is displayed that shows the configuration of all the output channels.

```
OUTPUTS [<SP> start channel] <CR>
```

For each output channel, the following parameters are defined:

##### Operating Mode (Constrained list: CLOSED/ASCII/BINARY)

If the channel is closed, no data will be sent on this channel. If it is in either ASCII or binary mode, the EMC will generate ASCII or binary Event Log messages respectively.

##### Enable Event Log Operation (Constrained list: YES/NO)

This parameter determines whether or not Event Log messages are transmitted on the channel.

##### Enable Link Statistics (Constrained list: YES/NO)

This parameter determines whether or not link statistics displayed in a readable format for the user are transmitted on the channel.

**Enable Dump Operation (Constrained list: YES/NO)**

This parameter determines whether or not USO/System Module trap dumps are transmitted on the channel.

**Parity (Constrained list: NONE/ODD/EVEN/SPACE/MARK)**

This parameter determines which parity (if any) is to be applied to data transmitted on the channel.

**Event Filter (Constrained list made up from filters defined by the FILTER command)**

This parameter determines which filter to apply to Event Log messages transmitted on the channel.

**Protocol (Constrained list: NONE/NMC)**

This parameter determines which protocol (if any) will be used on the channel.

**EMC Events (Constrained list: YES/NO)**

This parameter determines whether or not any Event Log messages generated by the EMC itself are to be transmitted on this channel.

**Flow Control (Constrained list: NONE/DC1-DC2/DC1-DC3)**

This parameter determines which form of flow control (if any) will be responded to.

**Physical Port (Constrained list: YES/NO)**

This parameter determines whether or not the channel is to be routed to the physical port. Only one output channel at a time can be routed to the physical port.

Note, that if an output channel operating mode is closed, all the other parameters are irrelevant and they will be blanked out on the screen and the cursor will not visit them.

Similarly, if an output channel is operating in binary mode, the Event Log, Link Statistics, Dump and Parity parameters are irrelevant and they will set to defaults on the screen and the cursor will not visit them.

Also, if an output channel is operating in ASCII mode, the protocol parameter is irrelevant and it will be blanked out on the screen and the cursor will not visit it.

#### Possible errors:

- Bad channel [c] – start channel should be in the range 1 to 3. (Where *c* is the channel specified.)
- Only one output channel can be mapped to the physical port at a time
- There are no filters defined – an output channel requires a filter associated with it, the command cannot proceed if none are defined.

#### 4.3.16 PASSWORD

This command is used to change the Manager password. When you execute this command you will be prompted to enter the old password to confirm your authority. You will also be prompted to enter the new password and to enter it a second time as a check.

PASSWORD <CR>

#### Possible errors:

- The password entered does not match the current password.
- The two versions of the new password are different.

#### 4.3.17 PHYSICAL

This command is used to define the communications parameters for the physical port.

PHYSICAL <CR>

The following parameters are defined:

Speed (Constrained list: 1200/2400/4800/9600)

This parameter defines the speed in bps at which the port will operate.

Data bits (Constrained list: 7/8)

This parameter defines the number of data bits the port will generate.

Stop bits (Constrained list: 1/2)

This parameter defines the number of stop bits the port will generate.

### 4.3.18 STATUS

This command is used to display useful status information.

STATUS <CR>

Four categories of information are displayed. First, node information, followed by queue information, output channel data and input channel data.

### 4.3.19 TEXT

This command allows you to define the text strings that can be associated with new Event Log messages. It is used in conjunction with the DEVICE and MESSAGE commands.

TEXT <CR>

For each text string the following are defined:

Text (free-form alphanumeric)

This is the text itself.

Index (Integer)

This is the index that internally defines the text.

Note that Cray will supply all this information if required.

### 4.3.20 TIME

This command is used to define the EMC system time. The time is displayed at the top right of the screen and is used to time- and date-stamp the Event Logs that the EMC itself generates.

TIME <CR>

Possible errors:

- Bad year [*y*] – year should be in the range 1992 to 2091 (where *y* is the year specified).
- Bad month [*m*] – month should be in the range 1 to 12 (where *m* is the month specified).
- Bad day [*d*] – day should be in the range 1 to *n* (where *d* is the day specified and *n* is the last day in the specified month).
- Bad hour [*h*] – hour should be in the range 0 to 23 (where *h* is the hour specified).

- Bad minute [*m*] – minute should be in the range 0 to 59 (where *m* is the minute specified).
- Bad second [*s*] – second should be in the range 0 to 59 (where *s* is the second specified).

#### **4.3.21 TRAP**

This prompt line command is used to suppress the warning message displayed when logging-on if the EMC has trapped.

`TR <CR>`

The warning message displayed when logging-in will be suppressed for future logons. Note that if the EMC subsequently traps again, a new warning message will be displayed until the TRAP command is invoked again.

#### **4.3.22 VERBOSE**

This command is used to enable or inhibit the automatic display of help text when entering a field in a form or table.

`VERBOSE[<SP> E] <CR>`  
`[<SP> I]`

#### **4.3.23 WARM**

This command is used to perform a warm start of the EMC.

`WARM <CR>`

When you issue this command, you will be prompted to confirm the request. If you do so, the EMC will restart with the same configuration.



From time to time, as products in the DCX range are upgraded, new DCX Event Log messages are created. The EMC provides a mechanism that allows you to 'introduce' the new messages to it without having to upgrade the EMC software. It manages this by providing the DEVICE, MESSAGE and TEXT command.

## 5.1 Defining a New Event Log Message

When a new message is created Cray will supply the following information for it.

- Originating device name
- Originating device identifier
- Message index
- Message follow-up type
- Message display number
- Message major/minor status
- Message text proforma
- Text string(s) associated with the message
- Text string(s) index(es)

You should then perform the following steps to introduce the message:

1. Logon to the EMC Manager.
2. Use the DEVICE command to see if the originating device is defined and, if not, to define it.
3. Use the MESSAGE command to define the new message.
4. Use the TEXT command to define the text strings if there are any associated with the message.
5. Logoff the EMC Manager.

The EMC is now primed with the new message and will remember it even across power failures since the information is included in the EMC configuration data.

The trap mechanism implemented in the EMC is a long-term, on-line debugging tool, used by engineering personnel to locate the source of faults.

When the T indicator is on, the error/status indicators collectively show a trap code. When a trap has occurred the display alternates between the trap code and the error and status indications that were prevailing at the time of the trap. If this occurs, the trap code (the indicators illuminated along with the T) should be noted down for reporting to Cray if the fault persists. The card should then be reset by shorting the RESET pins (LK7) behind the card puller.

Alternatively, the T indication and trap code will be displayed for a few seconds, then the EMC will automatically restart.

It is recommended that persistent traps are reported to your supplier.



The issue of EMC covered by this manual supports messages generated by System Module, USO, NCAM, EMC, Ethergate, OSigate and 844. In addition, the EMC is capable of generating its own Event Log messages to report its own state of operation. When a message is generated, it is transmitted on all output channels that are configured to handle EMC events.

EMC events conform to the standard DCX format, comprising two lines of text. The first line contains the EMC node identity and a time/date stamp. The second line contains a description of the event.

The first line is of the form:

NODE nnn AT hh.mm ON yy/mm/dd

The second line contains one of two messages listed alphabetically below. (The contents of square brackets are the alternative words which may appear in the same message.)

#### EMC CORRUPT DATA ON CHANNEL CC

Data has been received on input channel CC that does not conform to Event Log message formats.

#### EMC DATA LOST

The EMC has been forced to discard incoming messages due to low memory levels. This will be due either to the input channels not being configured for flow control or the supplying devices not responding to flow control.

#### EMC HEARTBEAT FAILURE ON CHANNEL CC

The input channel CC output a heartbeat but no response was received from the downstream EMC.

**EMC MANAGER LOGGED OFF**

**An EMC management session has been terminated.**

**EMC MANAGER LOGGED ON**

**An EMC management session has been initiated.**

**EMC X-OFF STATE <sup>[ENTERED]</sup><sub>[CLEARED]</sub> ON CHANNEL CC**

**Channel CC has been X-off/X-on'd (output channels) or has requested X-off/X-on (input channels)**



