



## PowerFax M-E1

The Commetrex PowerFax M-E1™, a 30-line fax board with an integrated E1 digital trunk interface with PTT approvals in over 37 countries. It employs the latest in DSP technology to halve the cost of high-density PC-based fax boards. The M-E1, and its sister products, the M-4, M-8 and the M-T1, redefine the economics of fax servers of all types. Although they are priced at approximately thirty percent less than that of competitive products they offer world-class, market-proven performance, and in the

case of the M-E1, unmatched system density. The M-E1 software is available for the Windows NT operating system and is installed via an easy-to-use automated installation procedure.

The PowerFax M-E1 is designed to simplify application development and ease end-user installation. It includes, in addition to fax send and receive, file-format conversion, document-queue management, and fax-status functions. And the MultiFax Fax Description Language (MultiFax FDL) supports the dynamic assembly of a fax from multiple elements, such as graphics and text.

### Features

- High density—30 fax lines per board
- Integrated digital E1 trunk interface
- Automated software install/deinstall
- 14.4 Kbps send/receive
- Turnaround polling
- Dynamic document re-sizing and re-encoding
- DSP-based fax software
- No-charge software upgrades
- MultiFax Fax Description Language
- Comprehensive API and developer's kit
- C-language demo programs
- Highest-productivity development environment
- Unlimited technical support
- Support for EuroISDN
- Approvals in 37 countries

### Benefits

- Economical, high-density systems
- Uses one slot - reduced system size and cost
- Simplifies installation - reduces opportunity for errors
- Software-defined functionality offers the ultimate in system configurability.
- Updated fax-resource software at no additional cost
- On-the-fly creation of fax text and documents
- Turnaround polling with document ID simplifies fax-on-demand systems
- Comprehensive technical support and demo programs speed system development
- Broad market coverage

## Overview

The PowerFax M-E1 multiline fax system combines Windows NT APIs, the MultiFax modems, 30 ports of fax and an E1 integrated digital trunk interface on a single, long ISA slot PC add-in board. The M-E1 includes an "enhanced-compliant" MVIP switch to support advanced applications that require inter-board connection and switching. The M-E1 also includes a powerful, '386-class control processor and a large DRAM to dramatically reduce host-PC overhead. The fax modems are implemented on open-architecture Texas Instruments DSPs, allowing easy software upgrades to take advantage of the latest software releases.

Commetrex's MultiFax, the M-E1's technology foundation and field proven since mid-1993 as an OEM software product, is being used by over 100 fax-system developers in Asia, North America, and Europe. It is being used in the most demanding applications to send and receive hundreds of thousands of faxes a day. But the M-E1 is not just a proven multiline fax board. It's a comprehensive developer's system that supports the rapid development of high-function fax systems of all types. With its exclusive Fax Description Language (FDL), the M-Series developer can easily implement information-service platforms which create ad hoc fax images from disparate elements such as text and graphical objects.

The M-Series boards have the highest fax-machine connection rate in the industry. Not only has the M-Series T.30 protocol software been refined in over four years of market use, the M-Series can also dynamically re-size and re-encode fax images to suit the capabilities of the receiving terminal. This means a B4 MultiFax image can be dynamically converted to A4 size should the receiving terminal not support B4. Similarly, MR-encoded images will be dynamically converted to MH should the receiving terminal not support MR.

## Install Package

The M-E1's installation package is designed to dramatically reduce the support costs associated with broad market distribution.

## Applications

The M-E1 offers the fax-system end-user or developer, the lowest-cost, highest-density, PC-based multiline fax platform available. It is suitable for any multiline fax application, and is used most frequently in high-volume, fax-server, fax-mail and fax store-and-forward applications. The M-E1's easy-to-use graphical install process makes the M-E1 ideal for applications, such as fax servers, where the installer is often an untrained reseller or end user.

## System Environment

The M-E1 provides you with the most productive development environment available for fax applications. There are three main data structures in MultiFax: MultiFax Document Queues (MDQs), Fax Status structures, and MultiFax System Parameters. MDQs, which are managed with 7 MultiFax functions, contain documents to be sent and received. This permits documents to be easily assembled independently of the fax application, strongly supporting broadcast applications and client/server architectures. The Fax Status structures reflect the status of the current fax operation, including such indications as current page, current document, fax negotiation results, transfer rate, resolution, encoding, and error codes. System parameters hold information such as the default values for subscriber ID, country code, and manufacturer ID.

The M-E1's API is identical to that of all other members of the PowerFax M-Series. This means the application, including all call-control functions, is developed without regard to the board being used, significantly lowering the development-resource commitment of supporting a broad range of system sizes and international markets.

## MultiFax FDL

MultiFax Fax Description Language (FDL) macros support the creation of faxes from dynamically assembled elements. For example, a personalized fax letter including information obtained from a centralized database, a pre-scanned signature, the date, time, and even a per-call personalized paragraph, can be created and transmitted in seconds. Examples of FDL macros are

@CONVERT:END	@CONVERT:PADTOEND
@CONVERT:FILE	@CONVERT:PAGEBREAK
@CONVERT:FONT	@CONVERT:PAGESIZE
@CONVERT:MARGIN	@CONVERT:TEXT

These macros are inserted into a text file and converted using the MultiFax file- and format-conversion functions. The resulting file is then placed in the appropriate MDQ.

## Format Conversions

The files produced by word processing, page layout, and graphics packages are generally not in the file format a fax transmits and receives. MultiFax supports conversions from FDL, PCX, Bi-Level TIFF, TIFF-F, and text (including Windows NT outline fonts).

## M-Series API Functions

MFCPlaceCall	MFCSetDocHeader
MFCAnswerCall	MFCGetDocStatus
MFCAnswerFaxPoll	MFCGetSessionStatus
MFCSendFax	MFCGetVersionInfo
MFCCancelFax	MFCCheckTIFF
MFCOpenConvert	MFCCreateQueue
MFCFaxConvertDirect	MFCQueueDoc
MFCEndConvert	MFCQueueFree
MFCReceiveFax	MFCReleaseCall
MFCGetDigit	MFCGetParms
MFCStartDTMFDetector	MFCResetSendQueue
MFCGetConvertedPages	MFCSetPageSize
MFCMergeFile	MFCSplitFile

## Developer Support

The M-E1 includes unlimited technical support. And at Commetrex this is top-level support. Our support engineers are development engineers themselves, experienced in developing in-house applications using the same Commetrex products

our customers use. They are experts in not only the specifics of MultiFax, but with the computer, telephony, and fax environments as well.

## Specifications

**HOST REQUIREMENTS:** Pentium PC with Windows NT

**CAPACITY:** One E1 (DSX-1) 30 ports per board. 90 ports per PC

**FAX ENCODING:** MH, MR and MMR. Error Correction Mode (ECM)

**FAX MODEMS:** V.21 (300bps) for T.30 negotiation, V.27ter (2400/4800bps), V.29 (7200/9600bps), V.17/V.33 (14400/12000/9600/7200bps)

**FORMAT CONVERSIONS:** ASCII, PCX, TIFF-F, TIFF, Windows NT System Fonts, FDL

### BOARD WARRANTY

7-year hardware warranty

### CEPT E1 G.703 TELEPHONY INTERFACE

**Interface:** Full featured G.703 2048 Kbps trunk interface. Complete interface to one E1 trunk

**Framing:** CEPT G.703 Channel Associated Signaling

**Insertion and Detection:** ABCD bits for Channel Associated Signaling and HDLC/LAPD for generating/Terminating a data link.

**Line Code:** HDB3 or AMI (no zero-code suppression)

**Alarm Signal Capabilities:** Loss of Frame Alignment (OOF), Loss of Signaling Multiframe Alignment, Loss of CRC Multiframe Alignment (red), Remote Alarm and Remote Multiframe Alarm (yellow), Alarm Indication Signal (AIS) (blue)

**Counts:** Bit error rate and CRC error

**Loopback:** Per channel and across channels under software control

**Connector:** 75 ohm BNC coax or 120 ohm RJ-48C

### HOST INTERFACE

**Electrical:** PC/AT bus designed to IEEE P966 ISA

**Mechanical:** Board designed to meet IBM's specifications PC/AT Prototype Adapter Reference Manual #6361674

**Bus Speed:** 4-12 MHz

**I/O Mapped Memory:** 128 KB of on-board interface memory accessed at DMA rates via I/O string move

**I/O Addresses:** Switch select any of the 64 I/O addresses

**Interrupts:** Choice of 7 software configurable interrupt lines with all boards sharing only 1 interrupt line

## POWER REQUIREMENTS

2.5 Amps per board of PC/At power at +5 volts

## TONE DIALING

**DTMF Digits:** 0-9, \*, # and ABCD per ITU-T Q.23 and Q.24

**Rate:** Programmable (10 digits/sec nominal)

**Dialing Parameters:** Software controllable

**Dialing Amplitude:** Network compatible (configurable by country) programmable range - 33 dBm to 1 dBm

## DTMF TONE DETECTION

**DTMF Digits:** 0-9, \*, #, ABCD

**Dynamic Range:** -40 dBm to 0 dBm per tone, (configurable)

**Tone Duration:** 40 ms (minimum)

**Acceptable Twist:** 10 dB

## ENVIRONMENT

**Operating Temperature:** 0°C to 50°C

**Storage Temperature:** -20° to 70° C

**Humidity:** 5 to 80%, non-condensing

## ON-BOARD PROCESSORS AND MEMORY

**DSPs:** 6 Texas Instruments TMS320C51 DSPs at 50 MIPS each

**Microprocessor:** 25 MHz 80386SX

**Memory:** 2 MB of dedicated DRAM for the on-board microprocessor and 256 KB of fast static RAM for the on-board microprocessor (128 KB shared with the host and 128 KB shared with the DSPs)

## MVIP DIGITAL SWITCHING

Enhanced-compliant MVIP interface provides total flexibility in connecting E1 channels to DSP resources, to other E1 channels, or to MVIP bus timeslots. Note that connections between E1 channels, or between E1 channels and other on-board resources, do not tie up MVIP bus timeslots. MVIP timeslots are only consumed when needed for inter-board connections.

## STANDARDS COMPLIANCE

**G.703:** Physical/electrical characteristics of hierarchical digital network

**G.704:** Synchronous frame structures used at primary and secondary hierarchical levels

**G.706:** Frame alignment and cyclic redundancy check procedures

**G.732:** Characteristics of primary PCM multiplex equipment

**G.823:** Control of jitter and wander within digital networks based on 2048 Kpbs hierarchy

**ANSI T1E1/88-00:** IRI carrier to customer installation DS1 metallic interface

**EN55022, EN50082-1:** European EMI/EMC Standards

## ORDERING INFORMATION

**PN 10016-1:** M-E1, 75 ohm BNC coax

**PN 10016-2:** M-E1, 120 ohm RJ-48C

**PN 30016-1:** M-E1, 75 ohm BNC coax Starter Kit (includes M-Series Developer's Kit)

**PN 30016-2:** M-E1, 120 ohm RJ-48C Starter Kit (includes M-Series Developer's Kit)

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