ETERNITY

The Special Digital EPAX for PLCC Applications

Electricity infrastructure is the lifeline of every modern community, state and country.

Instant, live-wire communication is vital for the people who run and maintain electricity generation, transmission and distribution. They demand a communication system that is reliable, intelligent and flexible. Due to the special nature of their PLCC communication network and application, they need a special product that is designed keeping their infrastructure and requirements in mind.

Introducing Matrix ETERNITY The Special Digital PLCC Switch for electricity utilities!

MATRIX
TELECOM SOLUTIONS

The PLCC network itself is typical in its architecture and topology. In addition, PLCC users depend heavily on communication to keep the electricity infrastructure run uninterrupted round-the-clock. Matrix ETERNITY is the result of thorough study of PLCC requirements and many years of experience in designing similar products.

Flexible

Flexibility is the core strength of the Matrix ETERNITY. Its open, universal slot architecture allows it to be upgraded at any time to adapt to the growth and changes in the PLCC network. Various combinations of cards make it possible to configure Matrix ETERNITY to match the exact need of a site.

Non Blocking PCM-TDM Technology

Built on PCM-TDM technology with high density digital switching platform, ETERNITY provides 100% non blocking system to perform efficiently in heavy traffic environment. Each interface port has its own dedicated DTMF encoders and decoders to support simultaneous dialing and receiving calls on all the ports. This makes ETERNITY a truly Non blocking switch.

Integrated

Matrix ETERNITY provides 4 built-in ports for digital key phones and operator consoles (ETERNITY ME). Multi-party Conferencing Bridge and 256 seconds (16 messages x 16 seconds) Auto Attendant is an integral part of the standard product. Analog Input Port for external music, Analog Output Port for PAS, Digital Input Port for connecting Sensors and Digital Output Port for Relay control are built-in to the system. In addition, Printer Port (ETERNITY ME), RS232C Port, Ethernet Port and USB Port put together the Matrix ETERNITY an all-integrated PLCC Switch.

Reliable

The Matrix ETERNITY is designed for industrial applications requiring high reliability. Distributed processing, Universal slots architecture, Hot-swapping of interface cards and system fault log enhance the reliability of the product.

Versatile

Matrix ETERNITY supports plenty of various interfaces on the trunk and the subscriber sides to connect to diverse networks. It supports Plain Old Telephony System (POTS), E&M, GSM/3G, ISDN BRI/PRI, T1/E1 and VoIP. On the subscriber side Analog, Digital and IP phones provide user interfaces.

Matrix ETERNITY

PLCC Switches are available in three variants:

ETERNITY GE6S
- 6 Universal slots
- Expandable up to 120 Ports

ETERNITY ME10S
- 10 Universal slots
- Expandable up to 324 Ports

ETERNITY ME16S
- 16 Universal slots
- Expandable up to 516 Ports

ETERNITY ME10S

ETERNITY GE6S

TECHNOLOGY

32-bit RISC Architecture
High speed 32-bit RISC Processor with 32MB SDRAM and 32MB Flash Memory empowers the ETERNITY to provide real-time response to all the incoming and outgoing calls fluently.

Compact and Sturdy Design
ETERNITY's compact design leads to smaller foot-print. 19" rack and wall mount design leads to ease of maintenance and occupies lesser space. Besides, all the parts have been fixed in specifies slots. This 'no moving parts' design leads to higher reliability.

Dedicated DTMF
Matrix ETERNITY offers dedicated DTMF circuit for each user port making it 100% Non-blocking even while dialing. This is a critical parameter for organizations expecting heavy call traffic. This is what makes Matrix ETERNITY a 100% Non-blocking system in the true sense.

Distributed Processing
Matrix ETERNITY employs multiprocessor architecture, wherein each interface card has its own dedicated microprocessor. This local (Slave) processor is responsible for local processing of events and commands. The master processor manages all the slaves. This technology enhances flexibility and reliability.
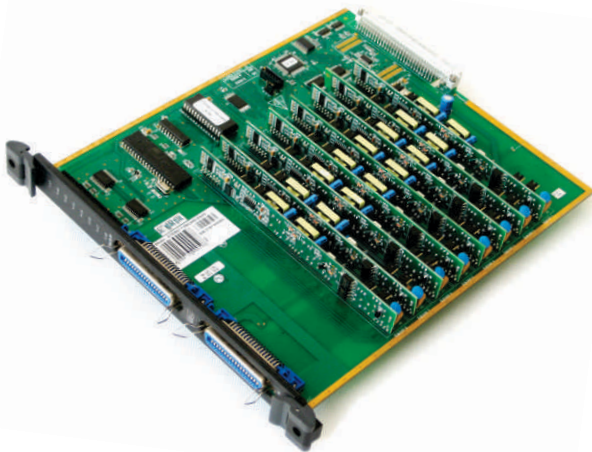
ETERNITY ME - E&M8 Card
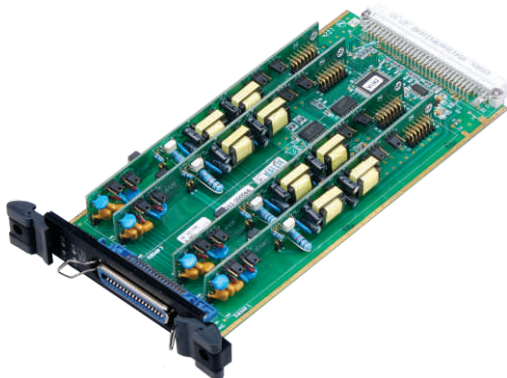
ETERNITY GE - E&M4 Card

High Density Digital Switching
Built-with PCM/TDM digital technology, the ETERNITY ME10S and ETERNITY ME16S uses 1024x1024 switching matrix to provide unrestricted communication to all the users simultaneously.

Hot-Swappable Cards
In a high-reliability scenario, the ETERNITY ME platforms allow replacing old or faulty interface cards without switching off the system.

Multi Network Operation
In addition to E&M ports, the ETERNITY also supports CO Lines (TWT), ISDN BRI, ISDN PRI, T1/E1, GSM/3G and VoIP network operation simultaneously using respective interface cards. This allows the ETERNITY to be used as a common switch for PLCC, POTS, ISDN, GSM/3G and the VoIP telephony networks.

Primary Protection
With the Rack enclosure, the ETERNITY ME10S can be supplied with primary protection, using IPM (Inter Protection Module) that consists of resettable fuses and GD Tubes to be mounted on MDF.

Redundancy
The ETERNITY ME10S offers redundancy for its all critical functional cards like Master Card, Switch Card and the 48VDC Power Supply Card. In event of failure of the Power Card and Switch Card, the stand-by card takes over without interruption of their functionalities. Whereas, if the active Master Card fails, the system restarts and stand-by card takes over automatically.

Secondary Protection
The ETERNITY provides built-in secondary protection circuit on each interface ports as per relevant standards at no extra cost.

SLIC based Design
Each Station (Extension) Port uses DSP based Subscriber Loop Integrated Circuit (SLIC), which offers programmable line parameters.

Standard 19" Sub Rack
The ETERNITY ME10S can be housed in the industry standard 19" rugged, powder-coated aluminium Sub-Rack (System Enclosure) and thus can be mounted in a rack with other data and networking telecom equipment.

Universal Slots
All the expansion slots of Matrix ETERNITY are universal in nature. Any of the cards can be inserted in any slot and the system will configure it automatically. This scheme eliminates configuration bottleneck because any slot can be used for E&M, SLT, DKP, CO (TWT), ISDN BRI/PRI, T1/E1, GSM/3G, VoIP, and Magneto allowing flexible configuration.

Web based Remote Management
Flexible and user-friendly web browser based GUI helps to program ETERNITY through any part of the world once it is connected with the IP network. Matrix ETERNITY incorporates built-in server functionality to configure it remotely using Internet.

INTERFACES

TRUNK (NETWORK) INTERFACES

CO (TWT) Lines
Being ETERNITY as a Universal platform for integration of multiple networks, it allows terminating 2-Wire Analog Trunks (CO Lines) to function ETERNITY as PLCC EPAX and Conventional PBX at the same time.

E&M Trunks
Matrix ETERNITY E&M card provides the interface to PLCC panel. Both E&M Dial-in/Tie line as well E&M Express lines can be terminated. ETERNITY supports E&M line with 2W/4W and Type IV/V. Using E&M interface, ETERNITY can also be deployed in typical power grid network to integrate with Routers, VSAT, DACS / Multiplexers, etc.

GSM/3G (Mobile) Trunks
Matrix ETERNITY supports GSM/3G connectivity by means of an optional in-skin interface GSM/3G card. User can dial out mobile number grabbing GSM/3G (SIM) line to avail convenience cost benefits offered by GSM networks.

ISDN BRI/PRI Trunks
ETERNITY supports connectivity to ISDN BRI (2B+D) and ISDN PRI (23B+D or 30B+D) lines to the system using an optional card. ISDN BRI and ISDN PRI lines can be configured as NT or TE as per application requirement. An ISDN Terminal, Video Phone or LAN can be connected to ISDN port if it is programmed in NT mode.

T1/E1 Trunks
The ETERNITY offers connectivity based on T1/E1 standards. Using DS1 card, Multiple ETERNITY can be connected over various media like Copper, Fiber, RF and VSAT. This card allows interface of ETERNITY EPAX to Radio Link, STM, xDSL Modem, DACS / Multiplexers etc.

VoIP Trunks (SIP based)
VoIP Network can be connected to Matrix ETERNITY through an optional VoIP card. Each VoIP card provides up to 32 Channel, enables users to call on all 32 channels simultaneously. ETERNITY is designed to support a maximum of 32 SIP accounts of various ITSPs.

EXTENSION INTERFACES

Analog Telephones (FXS)
ETERNITY provides FXS port to interface standard Analog (2-Wire) Telephone instruments. System can also be programmed using any analog telephone connected to FXS port of ETERNITY.

Diigital Key Phones (DKP)
Developed on proprietary protocol, Matrix ETERNITY offers Digital Extension port to connect Digital Key Telephone through a 2-Wire full duplex Digital Subscriber Network Interface Circuit. ETERNITY can be programmed using Matrix EON48 Digital Key Phones connected on the DKP port of the system.

IP Extensions (SIP based)
Any SIP enabled device such as IP phone, PC with Softphone or Mobile phone with SIP client can function as ETERNITY IP extension. Each IP extension is assigned unique user name and password to authenticate and establish calls using system resources regardless of being located anywhere on the global IP network.

ISDN Extensions (NT Mode)
ETERNITY provides ISDN BRI (2B+D) and ISDN PRI (23/30B+D) ports using optional interface cards. Ports on this card can be configured as NT to be used as ISDN extensions. Once configured as ISDN extension, any ISDN terminal (TE) device like ISDN Phone can be connected to it.

Magneto Phones
Built-in circuit and logic to generate ringing voltages, allows Magneto phones to be connected directly to the ETERNITY. It can detect incoming call ring and route the call to any digital or analog station. The station can just lift the handset and talk to the calling magneto phone. Similarly, a user can "crank" outgoing calls using magneto phones.

AUXILIARY INTERFACES

External Music Port (AIP)
The external music port allows an external music source to connect to Matrix ETERNITY. The desired music or jingle can be played while a person is kept on hold.

Public Address System Port (PAS)
The Public Address System Port allows any station user to make public announcements on external speakers.

Relay Port (DOP)
ETERNITY provides a solid state digital output port for connecting relay based devices for various controlling applications.

Security Dialer Port (DIP)
Matrix ETERNITY allows sensor devices to connect to its digital input port (DIP). In case of emergency, the ETERNITY dials 3 different pre-defined numbers and plays a pre-recorded message. A hooter can also be activated in case of an emergency.

Trunk-side Interfaces   Local or Remote Programming   Extension-side Interfaces
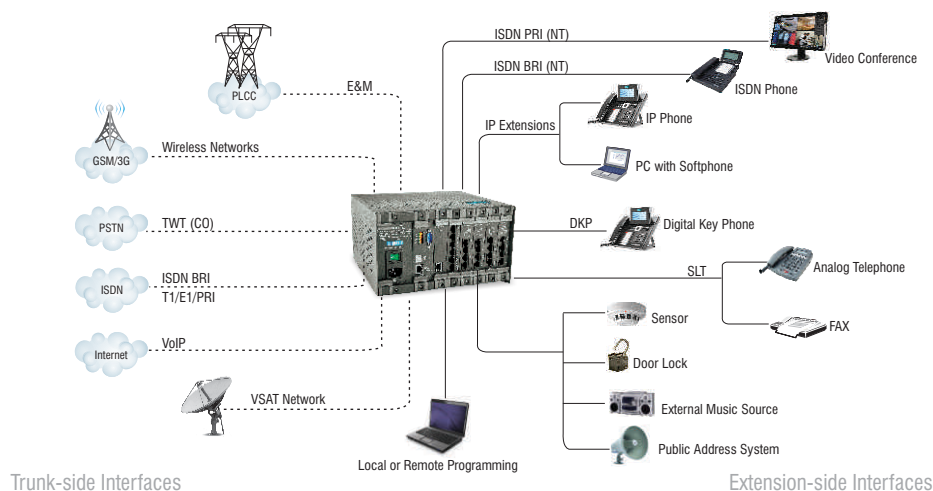
PLCC FEATURES

Alternate Routing
In a typical PLCC network, there can be multiple paths that a call can take to reach the destination. The ETERNITY has the facility to select an alternate route if a particular route is busy

Compander Control Signal (CCS)
To improve signal-to-noise ratio in a PLCC network, speech signals are compressed at source and decompressed at the destination. This process is activated by the Compander Control Signal (CCS). CCS can be activated in the ETERNITY at originating and destination stations. CCS can also be activated for transit calls. CCS signal is provided for each E&M port.

Destination Restricted Dialing
This feature restricts all the users of the system to make a call to certain destination even though trunk line is available to that destination. This feature blocks all the calls initiated by all users to specific destination.

Disable Out-of-Order Trunk
In event of faulty trunk line, ETERNITY disables the faulty trunk and takes it out of service to avoid routing of calls on such trunk lines.

Field Programmable
The hardware and software configuration can be changed in the field to adapt to the dynamic field requirement. Hardware capacity, Port configuration and Programming can be managed at the installation site. No specific tool is required while expanding the configuration on field.

Flexible Extension Numbering Plan
The ETERNITY offers flexible numbering plan for all the stations users. This can vary from 1 to 6 digits. Even overlapping numbers is also possible.

Flexible Station ID
In a PLCC network, each EPAX is given a Station Identity (SID). SID is used to route a call to its correct destination. ETERNITY allows setting of SID to any length from 1 to 6 digits, allowing seamless integration of ETERNITY in any existing PLCC network.

Multiple Station ID
The same ETERNITY can be programmed with multiple Station ID (SID). This provides flexibility of connecting the ETERNITY with Multiple PLCC networks.

Priority (Forced Call Disconnection)
In a PLCC network it is desired that calls from selected users have precedence over others. Such important users may be allowed to interrupt an ongoing call to request them for release of the current call. The ETERNITY offers priority to such users. There are 10 different levels of priority to cover entire hierarchy of any organization.

Programmable Pulse
ETERNITY provides flexibility to program the Engage/Busy Pulse, Released Pulse, Ringer Pulse and Dialed Digit Pulse to match with the pulses of PLCC network wherein it is getting installed.
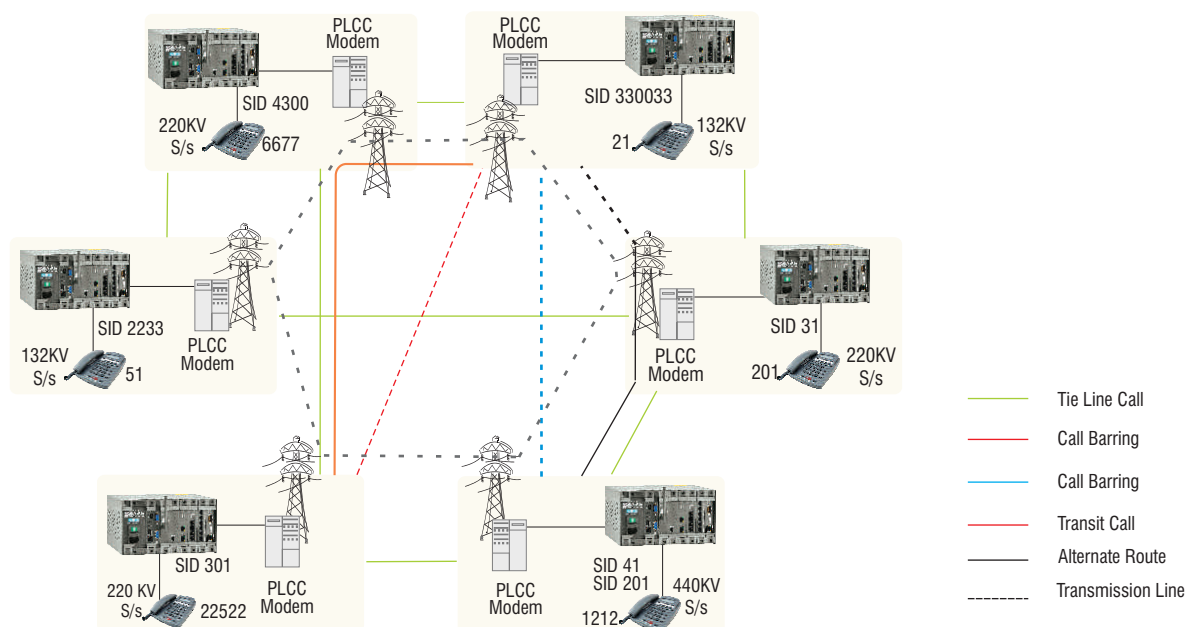
Web based Programming
Matrix ETERNITY can be engineered for change in its programming from a remote location also. This does not even require a PC or any other specialized device at the remote site. EPAX can be programmed remotely once it is connected to the Internet, saves valuable time and efforts in providing essential technical support.

Routing Table
Each call in a PLCC network is routed to its correct destination through programming of routing table and as many as 255 different routes can be defined.

PLCC Calling Features & Numbering Plan

————	Tie Line Call
————	Call Barring
————	Call Barring
————	Transit Call
————	Alternate Route
- - - - - - -	Transmission Line

System Activity Log and Report

ETERNITY records important events and exceptions within the system in its internal log file. Events like System restart, Card going faulty, Port getting hang, etc. are noted in this log. In turn, this log can be printed or transferred to a PC/Laptop for further review and archiving. System Activity Log can be printed in online mode by connecting a parallel or a serial printer on the respective ports.

System Fault Alarms

Failure of a card or such problems can be announced on the relay port provided on the Master (CPU) card of the ETERNITY. Hooter or Lamp can be connected using an appropriate external relay to draw attention of the operator or the engineer so that corrective actions can be taken.

System Fault Log

ETERNITY functions like a watch dog, whereby it maintains a log of all faults occurring in system. Various faulty events like Card Absent, RTC Failure, DS1 Signal Loss, BRI Signal Loss, and DKP/SLT absent etc. are registered in the fault log. On such events ETERNITY activates the Buzzer.

Transit Barring

A caller has many options in selecting a route while calling the desired destination in a PLCC network. If the designated route is busy, call may be routed through an alternate route or a system, which is meant for other locations. ETERNITY can block transition of such unauthorized routing of calls. This streamlines the flow of the traffic only on the designated routes.

Trunk Restricted Dialing

ETERNITY gives flexibility to group the trunks to avoid traffic on critical trunk/routes. This feature allows certain trunks to keep reserved for specific call traffic so that ordinary traffic does not flow through such trunks/routes. It helps user to balance the traffic evenly on all trunks.

User Restricted Dialing

User restricted dialing feature blocks a call originated from specific user for specific destination. When user tries to call specific destination, system rejects the call and thereby allowing other user to call same destination.

Auto Attendant Functionality

The built-in auto-attendant feature performs the task of a virtual operator by greeting the external caller and transferring call to the desired station. ETERNITY can greet and attend five calls simultaneously.

Call Accounting System (CAS) Interface

Matrix ETERNITY offers interface for most types of call Accounting System protocols available world-wide. This helps in easy integration of the third party call accounting software with Matrix ETERNITY.

Integrations of ETERNITY in PLCC and Optical Fibre Network
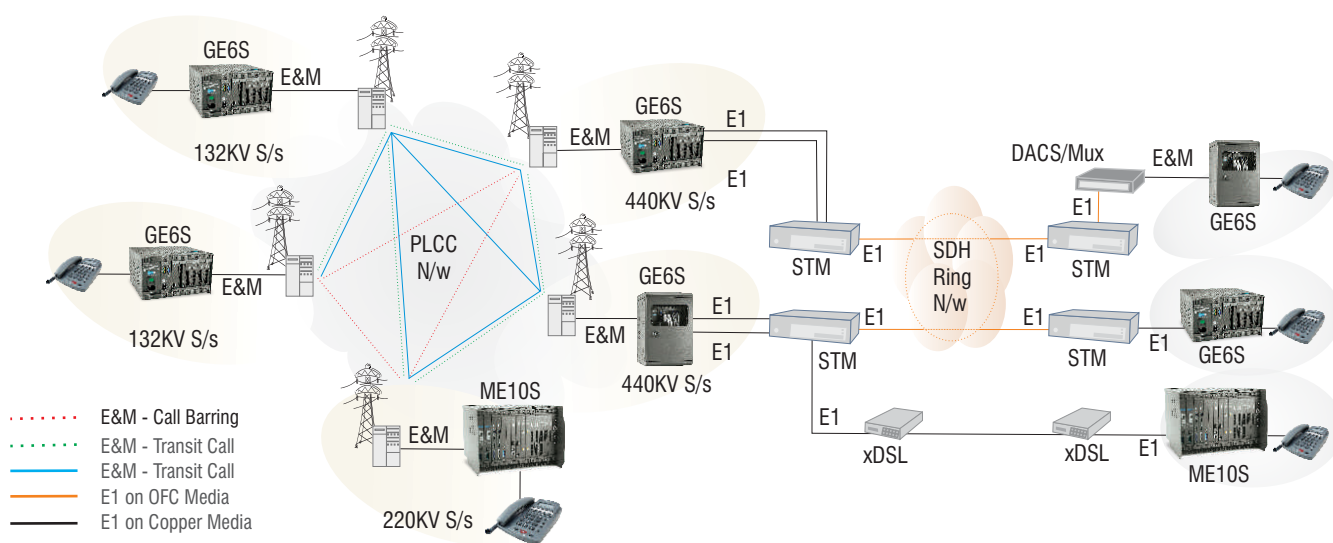
Call Progress Tones and Rings

ETERNITY provides Call Progress Tones like Dial Tone, Ring Back Tone, Busy Tone etc. Preset and programmable call progress tones can be selected to match with the country specific standards where it is getting installed. Similarly, ring cadences can also be selected.

Caller Line Identification (CLI)

Matrix ETERNITY offers CLI feature on Analog, Digital and IP Phones. It offers the facility to detect CLI on CO (TWT) lines, ISDN BRI, T1/E1/PRI, GSM/3G and VoIP lines. It can detect both, DTMF and FSK signals for CLI. You can get CLI of external number, internal number and CLI of transferred calls. If programmed, even the name of the caller can be displayed on the Digital Key Phones and IP Phones. Matrix ETERNITY offers flexibility to program the CLI feature for each extension individually.

Conference Dial-in

This unique feature allows participants of a conference to dial into a live conference at a scheduled time just by simply dialing a code. Certainly, a great time-saving feature!

Conference - Multiple Participants

Matrix ETERNITY supports a maximum 15 (ETERNITY GE6S) and 21 (ETERNITY ME10S and ME16S) participants in a single conference without compromising the speech quality. Multiple sessions of 3 or many participants can be conducted simultaneously.

Paging

Important announcements or messages can be passed to a larger number of people over Digital key phones or external speakers just by dialing a code. Mass communication at its best!

Voice Mail System

Matrix ETERNITY supports Voice Mail System through an optional VMS card. A voice mail system that provides efficient call management and accurate messaging can work wonders for your organization's productivity, by saving precious time of employees, yet allowing a non-interfering work environment. Key features like Voice Mail to Email, Message Wait Indication, Call Taping, Conversation Recording, Live Call Screening etc. are supported with VMS card.

Voice Message Applications

Matrix ETERNITY has built-in voice modules which can be used for various voice applications like Auto Attendant, Music on hold, Greetings, Reminders, DID Greetings and Guidance, Security Dialer, Message Wait, Alarms, Help etc.

ETERNITY PLCC EXPRESS SWITCH

Many PLCC networks use point-to-point lines for inter- connecting important locations. Each node is connected with all other nodes using direct links in a mesh network topology. This eliminates delay in routing a call due to intermediate transit switching and dialing. As a dedicated link is reserved between two nodes, the route remains never busy. This provides instantaneous connectivity between all the important locations like head offices, load dispatch centres (LDC), control rooms, generation plants, and major sub-stations (400KV/220KV). These lines are known as Express Lines or Hotlines.

Traditionally, each of these express lines is terminated on a separate phone or a console of 4 to 8 lines. Switching between lines is achieved using obsolete relay panels. Moreover, all the cables are taken right up to the desks of senior officers and mangers in their offices and control rooms. There is no way of easily identifying each line. Calls cannot be transferred easily and conferencing between multiple locations cannot be conducted. In short, many of the existing solutions are unwieldy and unreliable.

The modular and centralized and software driven architecture of the ETERNITY provide dependable platform for PLCC Express applications. Moreover, redundancy of critical hardware blocks are provided to meet needs of mission-critical applications.

The Matrix ETERNITY PLCC Express is the superset of all the switching functions. It has capabilities to work as a PLCC EPAX with transit functions. It also performs the role of a normal Office PBX. Hence in the cases where a customer does not wish to invest in separate switching infrastructure of PLCC Express, PLCC EPAX and PBX, the ETERNITY can be configured to handle all these functions.

USER TERMINALS

EXPRESS PHONE

'EON', the Express Phone, is a versatile, feature-rich, easy to use station. It supports a host of additional features providing the user fast access to the functions of Matrix ETERNITY at a single touch of a button. Matrix Express Phone is available in two models EON48P and EON48S. All models are available in two colour variants - Black and White.

EON48 - KEY FEATURES

- Full-Duplex Speaker Phone
- 6x24 and 2x24 LCD with Swivel, Backlit and Contrast Control
- Message Wait Lamp
- Ringer Lamp
- 16 Programmable Keys
- 17 Touch-Sense Keys for Features
- More Direct Station Keys on Optional Attachment (DSS16x4)
- Upright and Horizontal Angles for Desktop Mounting
- Desk-Top and Wall Mounting
- Call Log

EXPRESS PHONE FEATURES

Adjustable Ringer Volume and Speech Level
User has the option of adjusting the ringer volume level as per the requirement. The added advantage is that both receive and transmit speech levels can also be adjusted by the user.

DSS Keys
The EON48 offers 16 keys that can be programmed for each user, to access trunk line, SLT, DKP and even features, at a single touch of the key.

Executive and Operator Functionality
The EON provides user functionality of Operator or Executive by means of dedicated keys to perform specific task by single touch of buttons.

Last Dialed Calls
Last dialed 16 trunk calls can be stored.

Message Paging
User of the EON can page different pre-defined messages, like Meet Me, Congratulations, Meeting Today, etc., to other DKP users. These messages can be programmed by the system engineer.

Missed Calls
Details of last 20 missed calls can be viewed on the LCD of the EON. A useful feature for the user to find details of calls missed.

Tri Colour LEDs for Port Status
Status of other extensions (DKP and SLT) and trunk lines can be displayed on the Digital Key Phone.

OPERATOR CONSOLE

EONSOFT

PC based Digital Key Phone with two numbers of PC based DSS64

EONSOFT offers integration of your PC with Matrix PBX. A product of great utility to those techno-savvy people who has a computer on their desks and do not wish to keep a separate telephone.

EONSOFT KEY FEATURES

- Automatic Sensing of PC Status
- Automatic Sensing of Software Status
- Operator Mode (with 148 Keys)
- Handset Connectivity
- Help Menu
- Integration with Microsoft Address Book
- Keyboard Macros
- Keyboard and Mouse Operation
- Programmable Tool Tips on Mouse Over
- Shortcut Keys
- Standard Windows User Interface

IP PHONES

Matrix SETU VP is a range of feature-rich executive IP Phones. They provide intuitive operation for the call management functions. Their standard SIP based design makes them compatible with any SIP infrastructure like soft switches, IP PBXs, Registrar and Proxies. The SETU VoIP Phones offer WAN and LAN ports with routing. This makes them ideal for stand-alone applications requiring a PC to work with VoIP Phones. Full-duplex speaker phone, backlit LCD and capacity to handle calls simultaneously are a few of the keys strengths of these high-end VoIP Phones. SETU VoIP Phones are available in four variants, each with two color options: Black and White.

- **SETU VP248PE** with 6 Lines x 24 Characters LCD with PoE
- **SETU VP248SE** with 2 Lines x 24 Characters LCD with PoE
- **SETU VP248P** with 6 Lines x 24 Characters LCD
- **SETU VP248S** with 2 Lines x 24 Characters LCD

SETU VP KEY FEATURES

- 3 SIP Accounts
- Programmable Keys
- Anonymous Call Rejection
- Auto Configuration
- Auto Answer
- DHCP, PPPoE, NAT and STUN
- Peer-to-Peer Calling
- Dialed, Received, Missed and Rejected Call Logs
- G.711, G.722 (Wideband), G.723, G.726 and G.729AB
- LAN and WAN Ports
- Message Wait Indication
- Multiple Call Handling (4 Calls)
- Phone Book with 100 Entries
- Ringer, Speech and LCD Controls
- Voice Mail Key
- Web based Configuration

FEATURES LIST

- Abbreviated Dialing (Global & Personal)
- Access Codes (Programmable)
- Account Codes (Forced)
- Alarms (Time, Daily, Future Date & Time, Remote)
- Alarms - Multiple with Snooze
- Allowed and Denied Lists
- Alternate Number Dialing
- Auto Attendant
- Auto Call Back (Busy, No Reply)
- Auto Redial
- Background Music
- Barge-In
- Boss Ring
- Call Accounting System (CAS) Interface
- Call Back on Mobile Port
- Call Budget on Trunks
- Call Budget on Extensions
- Call Cost Calculation
- Call Duration Control
- Call Follow Me
- Call Forking (SIP based)
- Call Forward (Busy, No Reply, Dual Ring, External number)
- Call Park (General and Personal Orbit)
- Call Pick Up (Group, Selective)
- Call Progress Tones (Programmable)
- Call Splitting
- Call Taping
- Call Transfer (Screened, On Busy, While Ringing, Trunk to Trunk)
- Calling Line Identification and Presentation (CLIP)
- Calling Line Identity Restriction (CLIR)
- Class of Services
- CLI based Routing
- Closed User Group (With/Without Exchange ID)
- Conference Multiple Participants
- Conference Dial-in
- Conflict Dialing
- Continued Dialing
- Conversation Recording
- Department/Group Call
- Direct Dialing-In (DDI on T1/E1/PRI)
- Direct Inward Dialing (DID)
- Direct Inward System Access (DISA) - Automatic
- Distinctive Rings
- Do Not Disturb (DND)
- Do Not Disturb (Remote)
- Dual Ring
- Dynamic DNS (DDNS)
- Dynamic Lock (Manual)
- E&M Connectivity
- Embedded Registrar and Proxy Servers (SIP Server)
- Emergency Call Detection and Reporting
- Emergency Number Dialing
- External Music Port
- Fax over IP (T.38 Relay and Pass-Through)
- Flexible Numbers 2, 3, 4 Digits
- Forced Call Disconnection
- Hold
- Hot Desking

- Hotline (Immediate, Delay)
- Hot Outward Dialing
- Hotel/Motel Features
- Incoming Call Management
- Internal Call Restriction
- Interrupt Request
- Last Caller Recall
- Last Number Redial
- Least Cost Routing (Number, Time, Combination, Service Provider to Service Provider)
- Live Call Screening
- Live Call Supervision
- Master Time Zone
- Maturity (Polarity Reversal, Delay, CPD)
- Meet Me Paging
- Message Wait Indication (LED, Shattered Dial tone, Voice Message)
- Multi-Stage Dialing
- Music on Hold
- Name Programming (Station, Trunk)
- NAT and STUN
- Operator (Single, Multiple)
- Override
- Paging (Internal, External)
- Peer-to-Peer Calling
- Priority (Intercom and Trunk)
- Programming the System (Using SLT, DKP, Ethernet Port)
- QSIG on T1/E1/PRI
- Quick Dial
- Raid
- Scheduled Call Forward
- Security Dialing and Reporting
- Selective Trunk Access
- Self Ring Test
- SIP and RTP QoS (VoIP)
- SMDR Posting (Call Accounting System Interface)
- Station Groups
- Station In-Service/Out-Service
- Station Message Detail Recording (Incoming, Outgoing and Internal)
- System Activity Log and Display
- System Administrator (SA)
- System Debug
- System Fault Log
- System Security (Passwords)
- Toll Control
- Trunk Access Groups
- Trunk Auto Answer
- Trunk Reservation
- Upgrading the Software
- User Security (Password)
- Video Conferencing over T1/E1/PRI
- Virtual Stations
- Voice Help
- Voice Mail Integration
- Voice Mail to Email Notification
- Voice Message Applications
- Voice Prompts for Tones
- Walk-in Class of Service
- Web based Remote Programming

TECHNICAL SPECIFICATIONS

TECHNOLOGY

Type of Switching	: PCM/TDM Digital Switching (100% Non-Blocking)
Processor	: 32-bit RISC
Architecture	: Distributed Processing
Slots	: Universal

SLT (ANALOG STATION)

Signaling	: Loop start
Dialing	: DTMF and Pulse (10/20PPS)
Off Hook AC Impedance	: 600/900/Complex
Off Hook Current	: 39mA Max
Loop Limit	: 1800 Max (Excluding Telephone)
On-Hook Voltage (Tip/Ring)	: -48V nominal
DTMF Detection	: ITU-T Q.24
Return Loss	: >18dB
Longitudinal Balance	: >50dB
Transmission Level Adjust	: Tx Gain: -3dB to +6dB, Rx Gain: -3dB to 6dB
Ringing	: Trapezoidal 60VRMS/25Hz and Sinusoidal 52VRMS/25Hz
REN	: 3
CLI Presentation	: DTMF, FSK ITU-T V.23 and FSK Bellcore 202
Protection	: Over Voltage Secondary Protection
Physical Connector	: RJ45

DKP (DIGITAL STATION - EXPRESS PHONE)

Signaling	: Proprietary Digital (2B+D)
Interface	: Single pair for Speech, Signaling and Power
Loop Limit	: 100
Speech Level	: Adjustable Tx and Rx Gain for Handset and Hands-Free
Protection	: Over Voltage Secondary Protection
Physical Connector	: RJ45

TWT (2-WIRE TRUNK - CO LINES)

Signaling	: Loop Start
Loop Limit	: 1200
Off Hook AC Impedance	: 600/900/Complex
Pulse Dialing	: 10/20 PPS
DTMF Dialing and Reception	: ITU-T Q.23 & Q.24
Return Loss	: >18dB
Longitudinal Balance	: >50dB
Transmission Level Adjust	: Tx Gain: -15dB to +10dB, Rx Gain: -15dB to +10dB
CLI Reception	: DTMF, FSK ITU-T V.23 and FSK Bellcore 202
Call Maturity	: Delay and Polarity Reversal
Protection	: Over Voltage and Over Current Secondary Protection
Physical Connector	: RJ45

E&M

Interface	: Type IV and Type V
Speech Interface	: Two-wire and Four-wire
Trunk Seizure Type	: Immediate, Immediate + Wink, Seizure Pulse, Seizure Pulse + Wink, Express, Compander Control Signal (CCS)
Address Signalling	: Pulse Dial Pulse 10PPS, Pulse 20PPS Tone Dial DTMF
Return Loss	: 20dB
Transhybrid Loss	: 20dB against configurable balance of 600 ohm or AT&T complex impedance
Transmit Gain	: +/- 1.0 dB
Receive Gain	: +/- 1.0 dB
Physical Connector	: RJ45

ISDN BRI

Channels	: 2B+D
Personality	: Network (NT) and Terminal (TE)
Switch Variant	: AT&T 4ESS, DMS-100, ETSI NET3, ITU-T Q.921, ITU-T Q.931,NTT INS64, US Ni1 (National ISDN1) France Vnx
Protection	: Solid State (Over Voltage and Over Current) Built-in Secondary Protection
Physical Connector	: RJ 8

ISDN PRI

Channels	: 23B+D and 30B+D
Personality	: Network (NT) and Terminal (TE)
Line Coding	: AMI/B8ZS for T1 and HDB3 for E1
Framing	: ESF for T1 and CEPT1(with/without CRC) for E1
Switch Variant	: AT&T 4ESS, AT&T 5ESS, DMS-100, ETSI NET5, ITU-T Q.921, ITU- T Q.931, NTT INS64, US NI2(National ISDN 2), QSIC ECMA, France VN
Protection	: Solid State (Over Voltage and Over Current) Built-in Secondary Protection
Supplementary Services	: QSIG ECMA
Physical Connector	: RJ45 (Impedance Selectable)

E1 CAS

Bit Rate	: 2048 kbps +/- 50 ppm
Line Coding	: HDB3
Framing	: CEPT1 (with/without CRC) with CAS MF
Line Signaling	: ITU-T Q.400 – Q.490
Register Signaling	: MFC-R2
Alarms	: I.431, G.732, ETSI 300-233
Protection	: Solid State (Over Voltage and Over Current) Built-in Secondary Protection
Physical Connector	: RJ45 (Impedance Selectable)

T1 RBS

Bit Rate	: 1544 kbps +/- 50 ppm
Line Coding	: AMI and B8ZS
Framing	: D4, ESF
Line Signaling	: FXS Loop Start, FXO Loop Start, FXS Ground Start, FXO Ground Start, E&M (Immediate, Wink Start, Wink Start FGD)
Digit Dialing	: DTMF
Alarms	: ANSI T1.231
Performance	: ANSI T1.403, ANSI T1.231, AT&T TR54016
Protection	: Solid State (Over Voltage and Over Current) Built-in Secondary Protection
Physical Connector	: RJ45 (Impedance Selectable)

GSM

GSM Band (MHz)	: Quad-band: GSM850, EGSM900, DCS1800, PCS1900
Compliant	: ETSI GSM Phase2/2+
SIM Card	: One SIM per GSM Port
SIM Interface	: 1.8V, 3V
Transmission Power	: Class 4 (2W) at GSM850 MHz and EGSM900 MHz band Class 1 (1W) at DCS1800 MHz and PCS1900 MHz band
RF Sensitivity	: Better than -102dBm
Protocol	: AT Command Interface
External Antenna	: One Antenna per 4 GSM Ports, 1.8/3.0*dBi, 50 SMA (Male) Connector, Omni Directional with Cable of 3 Meters Length

3G

GSM Band (MHz)	: Quad-Band: GSM850,EGSM900, DCS1800, PCS1900 Tri-Band: WCDMA 850/1900/2100
Compliant	: ETSI GSM Phase 2/2+
SIM Card	: One SIM Per GSM Port
SIM Interface	: 1.8V, 3V
Transmission Power	: Class 4 (2W) at GSM850 Mhz and EGSM900 MHz Band, Class 1 (1W) at DCS 1800 Mhz and PCS1900 MHz Band, Class 3 (0.25W) at WCDMA 850/1900/2100 MHz Band
RF Sensitivity	: Better than -106dBm at GSM850, EGSM900, DCS1800, and PCS1900, Better than -106 dBm at WCDMA 850, Better than - 106dBm at WCDMA 1900/2100
Protocol	: AT Command Interface
External Antenna	: One Antenna per 4 3G GSM Ports, 1.8/3.0*dBi, 50Ω SMA (Male) Connector, Omni Directional With Cable of 3 Meters Length

* Depends on GSM Frequency Band

VoIP

VoIP Protocols	: SIP v2, SIP over TCP, Symmetric RTP, RTCP, 100rel/PRACK
Network Protocol	: IPv4,TCP,UDP, SNTP, STUN, ARP, ICMP, PPP, DNS, SMTP
SIP	: Maximum 32 SIP Accounts Per System, Out Bound Proxy Support, Display Name, User Name, password, URL, Proxy URL, Register Interval
Line Echo Cancellation	: G.168 With 64/128ms Tail Length
Voice	: Dynamic Jitter Buffer (Adaptive), Comfort Noise Generation and Voice Activity Detection
NAT	: STUN and NAT Keep Alive
Voice CODECs	: G.711 (A-law, μ-Law), G.723, G.729AB, GSM-FR, GSM-EFR and iLBC
Call Progress Tones	: Dial tone, Ring Back Tone, Busy Tone, Error Tone
Fax	: T.38 Relay and Pass Through
Quality of Service	: SIP QoS and RTP QoS
Security	: MD5 Authentication for SIP, Password Protected Configuration by Admin and User
Data Network	: Ethernet (RJ45) Port, Auto MDIX (10/100 baseT)
LED Indications	: 1-LED for System Status and 1-LED for Registrar Status

Auxiliary Ports

Analog Input Port	: 0.7 Vrms, Isolated, Push-Type Connector
Analog Output Port	: 0.7 Vrms, Isolated, Push-Type Connector
Digital Input Port	: Loop Sensing-Open/Close, 5mA, Push-Type Connector
Digital Output Port	: VDC Max = 60VDC, IDC Max = 0.15A, Push-Type Connector

POWER SUPPLY

Specifications / Variants	ETERNITY GE6S	ETERNITY ME10S	ETERNITY ME16S
Input	Option 1 (Mains): 100-240 VAC, 47-63 Hz, Option 2: (DC): 48VDC +/- 20%		
Power Consumption	25W	70W	100W
LED Indications	2 LEDs	3 LEDs	

ENVIRONMENTAL

Operating Temperature	-10$_o$C to +50$_o$C (14$_o$F to122$_o$F)
Operating Humidity	5-95% RH, Non-Condensing
Storage Temperature	-40$_o$C to +85$_o$C (-40$_o$F to +185$_o$F)
Storage Humidity	0-95% RH, Non-Condensing

MECHANICAL

Specifications / Variants	ETERNITY GE6S	ETERNITY ME10S	ETERNITY ME16S
Dimension (WxHxD)	26.0x16.0x25.4cm 10.24"x6.29"x10.0"	48.2x33.0x39.9cm 19.0"x12.9"x15.55"	52.3x33.0x39.9cm 20.5"x12.9"x15.55"
Unit Weight	3.5kg (7.7lbs)	8.3kg (18.3lbs)	10.5kg (23.1lbs)
Shipping Weight	6.5kg (14.3lbs)	12.3kg (27.1lbs)	15.0kg (33.0lbs)
Installation	Wall Mount Table Top	Wall Mount, Table Top 19" Rack Mount	Wall Mount Table Top

COMPLIANCES

EMI/EMC	Conducted Emission : CISPR 22 Radiated Emission : CISPR 22 Harmonic Current Emission : IEC 61000-3-2 Voltage Flicker : IEC 61000-3-3 Electro-static Discharge : IEC 61000-4-2 Radiated Susceptibility : IEC 61000-4-3 Electrical Fast Transient : IEC 61000-4-4 Surge : IEC 61000-4-5 Conducted Immunity : IEC 61000-4-6 Power Frequency Magnetic Field : IEC 61000-4-8 Voltage Interruption and Dips : IEC 61000-4-11	TEC	IR/IPX-01/03 APR2005
		EC Directives	R&TTE 1999/5/EC LVD 73/23/EEC EMC 89/336/EEC
		Safety	IEC 60950:2001 First Edition
		Environment Test	Cold Test : IS:9000 Part 2/Section 4
			Dry Heat Test : IS:9000 Part 3/Section 5
			Damp Test : IS:9000 Part 5/Section 1
FCC	Conducted Emission: FCC Part 15 Sub Part B Radiated Emission: FCC Part 15 Sub Part B	Mechanical	Vibration Test : IEC 600068-2-6:2007
FCC68	US:MTXMF01BETERNITY		Shock Test : IEC 68-2-27

PLCC PRODUCTS FROM MATRIX

Product	Description
ETERNITY GE6SAC	ETERNITY with 6 Universal Slots and Universal Power Supply (AC Mains)
ETERNITY GE6SDC	ETERNITY with 6 Universal Slots and DC Power Supply (48VDC)
ETERNITY ME10SAC	ETERNITY with 10 Universal Slots and Universal Power Supply (AC Mains)
ETERNITY ME10SDC	ETERNITY with 10 Universal Slots and DC Power Supply (48VDC)
ETERNITY ME16SAC	ETERNITY with 16 Universal Slots and Universal Power Supply (AC Mains)
ETERNITY ME16SDC	ETERNITY with 16 Universal Slots and DC Power Supply (48VDC)
ETERNITY GE6SAC PLCC Express	ETERNITY with 6 Universal Slots and Universal Power Supply (AC Mains) with PLCC Express Software
ETERNITY GE6SDC PLCC Express	ETERNITY with 6 Universal Slots and DC Power Supply (48VDC) with PLCC Express Software
ETERNITY ME10SAC PLCC Express	ETERNITY with 10 Universal Slots and Universal Power Supply (AC Mains) with PLCC Express Software
ETERNITY ME10SDC PLCC Express	ETERNITY with 10 Universal Slots and DC Power Supply (48VDC) with PLCC Express Software
ETERNITY ME16SAC PLCC Express	ETERNITY with16 Universal Slots and Universal Power Supply (AC Mains) with PLCC Express Software
ETERNITY ME16SDC PLCC Express	ETERNITY with 16 Universal Slots and DC Power Supply (48VDC) with PLCC Express Software

SYSTEM RESOURCES

System Resources	Description	ETERNITY GE6S	ETERNITY ME10S	ETERNITY ME16S
Universal Slots	The Maximum Physical Card Slots	6	10	16
Total User Ports	The Maximum Physical Ports Available	120	324	516

OPTIONAL INTERFACES

| System Resources	Description	ETERNITY GE6S	ETERNITY ME10S	ETERNITY ME16S
SLT Ports	To Connect Single Line Analog Telephones	120	320	512
DKP/DSS Ports	To Connect Proprietary Digital Key Phones or DSS Consoles	48	64/128*	64/128*
CO (TWT) Ports	To Connect Two Wire Trunk Lines	96	128	128
BRI Ports	To Connect to ISDN BRI Network or ISDN Compatible Devices	24	32	32
T1/E1/PRI Ports	To Connect to T1 or E1 or PRI Network or Compatible Devices	6	8	8
GSM/3G Ports	To Connect to GSM/3G Network	24	24/64*	24/64*
VoIP Cards	To Make VoIP (SIP) Calls Using Internet or Intranet, Maximum 32 VoIP Channels with each Card	6	10	16
IP Extensions	IP Phones, PC Softphones or Mobile SIP Clients	500	1000	1000
E&M Ports	To Connect E&M Network	48	80	128
Voice Mail System	To Configure as Voice Mail System	16 Port	16 Port	16 Port
Magneto Phone Ports	To Connect Magneto Phones	—	80	128
Redundancy	To Provide Redundancy in Case of Primary Hardware Failure	—	Available for Master Card, Switch Card, and PS48VDC	—

BUILT-IN INTERFACES

System Resources	Description	ETERNITY GE6S	ETERNITY ME10S	ETERNITY ME16S
DKP/DSS Port	To Connect Proprietary Digital Key Phone or DSS Consoles	-	4	4
RS232C Port	To Connect to a Computer for SMDR Output	2	2	2
Parallel Printer Port	To Connect to a Parallel Printer	-	1	1
Analog Input Port	To Connect External Music Device	1	1	1
Analog Output Port	To Connect to a Public Address System	1	1	1
Digital Input Port	To Connect to a Sensor or Panic Switch	1	1	1
Digital Output Port	To Connect to External Devices like Door Lock or Relay Port	1	1	1
Ethernet Port	To Access Web based Configuration, PMS, SMDR, System Log	1	1	1
USB Port	Reserved for Future Applications	1	1	1
Voice Modules	To Configure as Auto Attendant and/or for Recording Voice Message to be used in other Voice Message Application	16 Modules of 16 Sec. Each	16 Modules of 16 Sec. Each	16 Modules of 16 Sec. Each
Conference	Number of Conference Participants	15 Participants	21 Participants	21 Participants

ABOUT MATRIX

Established in 1991, Matrix is a leader in Telecom and Security solutions for modern businesses and enterprises. An innovative, technology driven and customer focused organization; the company is committed to keep pace with the revolutions in the telecom and security industries. With around 30% of its human resources dedicated to the development of new products, Matrix has launched cutting-edge products like IP-PBX, Universal Gateways, VoIP Gateways and Terminals, GSM Gateways, Access Control and Time-Attendance Systems, Video Surveillance System and Fire Alarm Systems. These solutions are feature-rich, reliable and conform to the international standards. Having global foot-prints in Asia, Europe, North America, South America and Africa through an extensive network of more than 500 channel partners, Matrix ensures that the products serve the needs of its customers faster and longer. Matrix has gained trust and admiration of customers representing the entire spectrum of industries. Matrix has won many international awards for its innovative products.

For further information contact:

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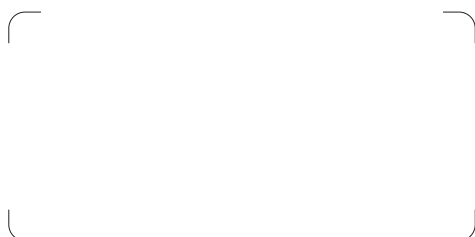
MATRIX COMSEC

394-GIDC, Makarpura,
Vadodara-390010, India.
Phone: +91 265 2630555
Email: Inquiry@MatrixComSec.com
www.MatrixComSec.com
SMS 'MATRIX' to 99987 55555

V3.R1-Feb'11

Due to continuous technology upgradations, product specifications are subject to change without notice.