MATRIX PLCC Cabinet
Installation Guide

MATRIX
TELECOM SOLUTIONS

MATRIX PLCC Cabinet

A Reliable Solution for Power Utilities

Installation Guide
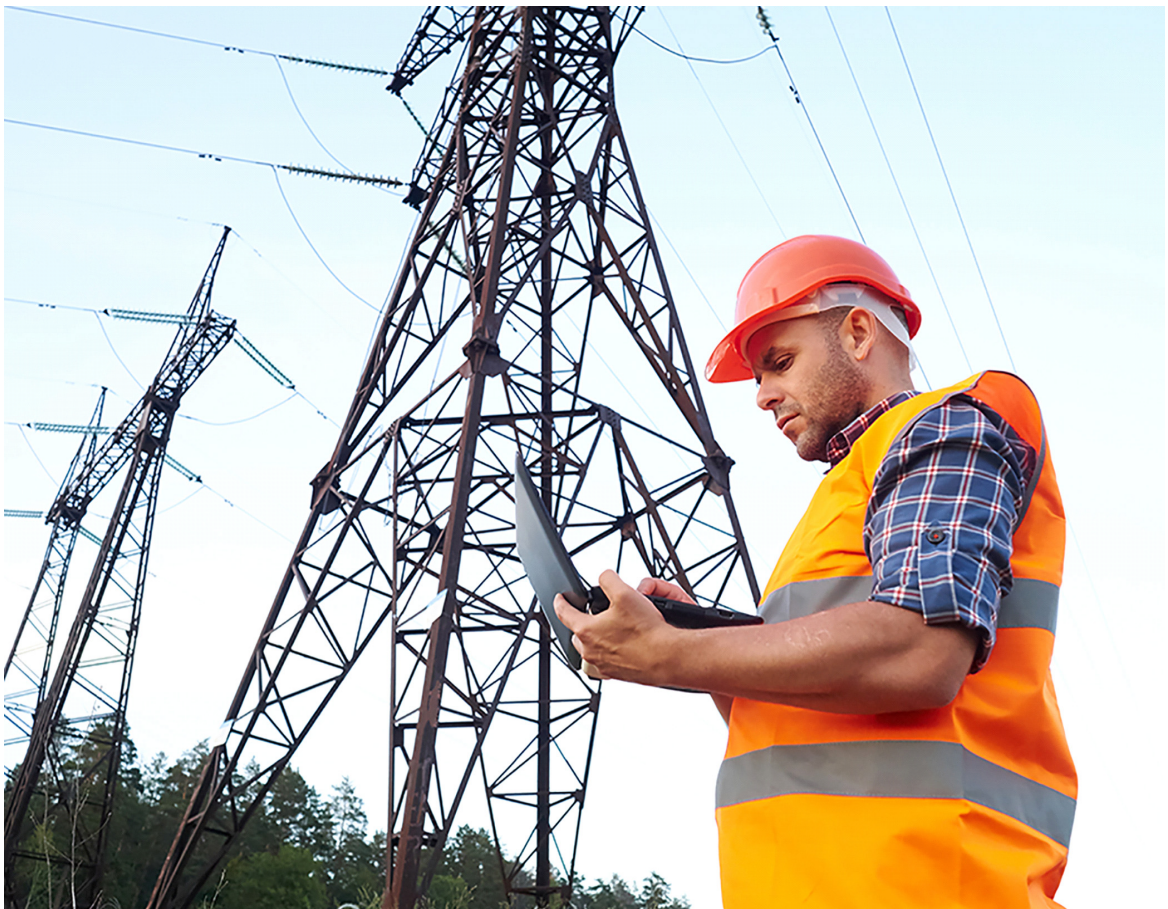
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This is a general documentation for all models of the product. The product may not support all the features and facilities described in the documentation.

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Introduction

Welcome

Thank you for choosing MATRIX PLCC Solution! The PLCC Solution is mainly designed for the Power Utility Companies. We hope you will make optimum use of this intelligent, reliable and versatile solution. Please refer this document carefully to get acquainted with MATRIX PLCC Solution.

MATRIX PLCC Solution is available in two variants — **PLCC Cabinet - MENX** for **ETERNITY MENX16SDC** and **PLCC Cabinet - GENX** for **ETERNITY GENX12SDC**.

This is a common documentation for both the variants. However, this document is written with reference to the PLCC Cabinet - MENX for ETERNITY MENX16SDC.

This document aims to provide the information regarding the installation procedure of ETERNITY MENX16SDC in the PLCC Cabinet. To know how to use the features and facilities offered by the System, refer to SARVAM UCS System Manual. The documentation can be found at https://www.matrixtelesol.com/product-manuals.html

You can also view or download the documents by scanning the QR Code printed on the Product Label/Packaging Label of the system.

For product registration and warranty related details, please visit https://www.matrixcomsec.com/product-registration-form.html

If you have any concerns regarding the installation procedure of PLCC Solution, contact Matrix Customer Care.

Know your PLCC Solution

In today's era, seamless connectivity with the globe is a key requirement for any organization and to establish this connectivity across the globe, organizations do need a reliable, versatile and intelligent System, that meets their day-to-day communicative and collaborative needs.

When organizations deploy the reliable System in their premises, they do consider some necessary alterations in their existing network infrastructure so as to establish uninterrupted connectivity with the globe.

But, as far as the Power Utility Companies are concerned, they intent for a solution that easily integrates with the their existing power line infrastructure. These companies do not want to make alterations in their existing infrastructure and need a solution that utilities their existing power grids as a communication link between various sub-stations.

To accomplish this specific need of the Power Utility Companies, MATRIX has designed the PLCC Solution.

With PLCC Solution, we are moving a step ahead to meet the day-to-to day communicative needs of the Power Utilities Companies.

The MATRIX PLCC Solution is available in two variants —

- PLCC Cabinet- MENX for ETERNITY MENX16SDC
- PLCC Cabinet- GENX for ETERNITY GENX12SDC

    You can purchase and deploy any of the above listed solution as per your site requirement and future needs.

Features and Benefits of PLCC Solution

- **Easy integration:** PLCC Solution integrates easily with the existing PLCC Infrastructure and uses the same network for communication across the various sites.

- **Saves Telephony Cost:** PLCC Solution saves the telephony cost by using the existing E&M Infrastructure. Beside using the traditional E&M, CO and ISDN connectivity, the solution also allows the power grids to avail multilateral benefits of cost effective IP and GSM networks.

- **Empowers the Existing Grid**: PLCC Solution empowers the existing grids by providing secure communication between the various sub-stations.

- **Radio Network:** PLCC Solution provides the radio network connectivity between the Control Room and Security Room.

- **Redundancy:** PLCC Solution supports redundancy and provides uninterrupted communication by minimizing the system downtime.

- **Flexible and Scalable:** PLCC Solution is an advancement in technology and supports all the different types of networks present in the modern power grids.

- **Connectivity with Hot Line:** PLCC Solution provides faster connectivity with the Hot line during Emergencies.

- **Ease of Management with Reliability:** PLCC Solution is reliable and easy to manage.

Specifications of the PLCC Variants

You can purchase and deploy any of the above listed variant as per your site requirement and future needs.

PLCC Cabinet - MENX for **ETERNITY MENX16SDC**

PLCC Cabinet - MENX for ETERNITY MENX16SDC is an integrated Unified Communication Server that caters the communication requirements of the Power Utility Companies.

The system saves the telephony cost by using the existing E&M Infrastructure. Beside using the traditional E&M, CO and ISDN connectivity, the system also allows the power grids to avail the multilateral benefits of cost effective IP and GSM networks. Thus, the system allows you to access multiple telecom networks on a single platform.

The system's intelligent Least Cost Routing logic diverts your calls through the appropriate network, ensuring least possible call cost. Other Intelligent features like Auto Attendant and CLI based Routing ensure efficient call management and prompt response to callers.

The system consists of 16 universal slots and is expandable upto 512 ports. The system architecture also supports redundancy and provides uninterrupted communication by minimizing the system downtime.

> ⓘ *Redundancy functionality is optional and is supported in ETERNITY MENX16SDC only. To know more about redundancy, refer to the topic Redundancy in SARVAM UCS System Manual*

PLCC Cabinet - GENX for **ETERNITY GENX12SDC**

PLCC Cabinet - GENX for ETERNITY GENX12SDC is an integrated Unified Communication Server that caters the communication requirements of the Power Utility Companies.

The system saves the telephony cost by using the existing E&M Infrastructure. Beside using the traditional E&M, CO and ISDN connectivity, the system also allows the power grids to avail the multilateral benefits of cost effective IP and GSM networks. Thus, the system allows you to access multiple telecom networks on a single platform.

The system's intelligent Least Cost Routing logic diverts your calls through the appropriate network, ensuring least possible call cost. Other Intelligent features like Auto Attendant and CLI based Routing ensure efficient call management and prompt response to callers.
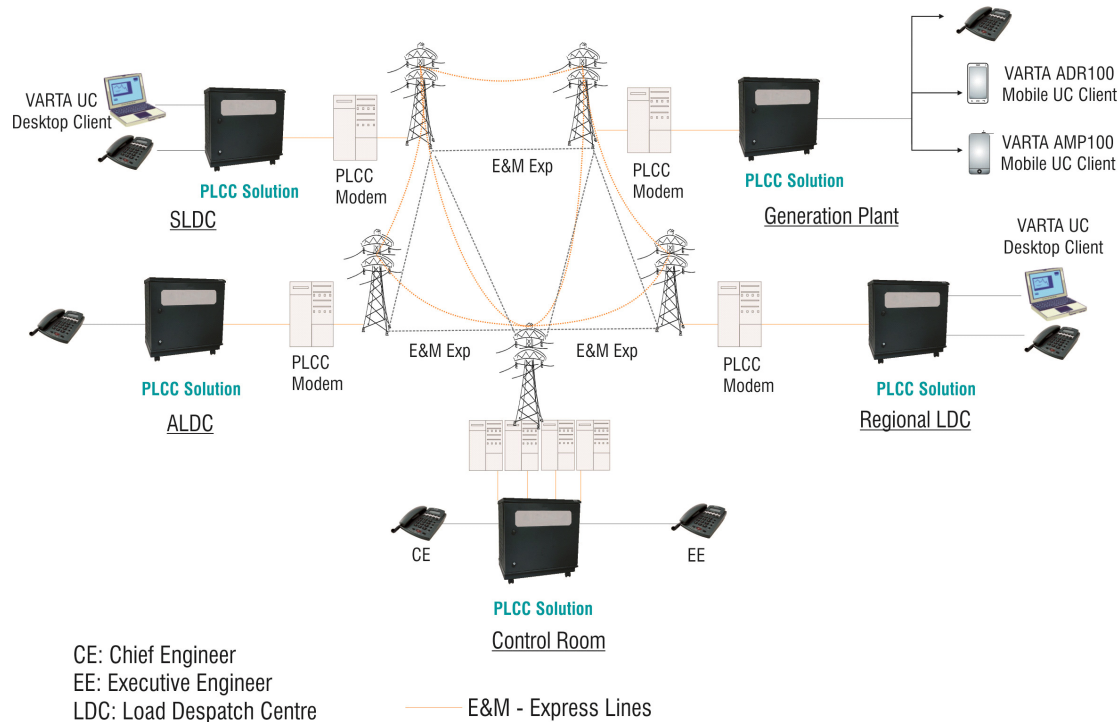
The system consists of 12 universal slots and is expandable upto 240 ports.

Application of PLCC Solution

MATRIX PLCC Solution is designed mainly for the Power Utility Organizations.

Illustrated below is an example of how PLCC Solution can be deployed in a Power Utility Organization.

Power Line Carrier Communication Application

CHAPTER 3   *Deploying PLCC Solution in a Power Utility Organization*

When you handle any electrical or electronic equipment, you are in a situation that could cause you bodily harm, besides damage to the product. Therefore, while handling the system you must follow the below listed points:

- The System must be installed by a persons, who is trained and experienced in telecom wiring. S/he must also be familiar with trunks, physical wiring of the MDF on both the System side and Trunk side.

- S/he must follow proper procedures for static electricity, while handling the System and its cards to prevent damage to the system and harm to him/herself.

- S/he must use a grounding mat and wear an anti-static strap/belt. Read the dos and don'ts listed in *Protecting the System and Yourself* in SARVAM UCS System Manual.

- S/he must also be aware of the safety hazards involved in electrical circuitry and the standard practices for accident prevention.

  To know more preventative actions to be taken while installing the system, refer to Protecting the System and Yourself in SARVAM UCS System Manual.

Unpacking the Boxes

Unpack ETERNITY MENX16SDC and the PLCC Cabinet - MENX and verify the contents as per your order. In case, any of the items is missing or damaged, contact your Dealer/Distributor.

Framework of the PLCC Solution

The network requirement of every customer is different and to fulfill the requirement of each and every customer, MATRIX supports customization of the PLCC Solution. As per the order received, the PLCC Cabinet along with the customized System is delivered to the customers.

The two major elements in the PLCC solution are the PLCC Cabinet and the Unified Communication Server. The Unified Communication Server must be installed in the PLCC Cabinet in order to use the solution.

The PLCC Cabinet-MENX is meant for installing ETERNITY MENX16SDC whereas PLCC Cabinet-GENX is meant for installing ETERNITY GENX12SDC.

This chapter illustrates the installation and deployment procedure of ETERNITY MENX16SDC in the PLCC Cabinet-MENX.

- Select an appropriate site for placing the PLCC Cabinet. The cabinet is a metal enclosure that has a provision of roller wheels and a front opening lockable door. After placing the cabinet at the appropriate location, lock the roller wheels so as to avoid any kind of dislocation.

PLCC Cabinet- MENX
Side clamp 1
Side clamp 2
Rack
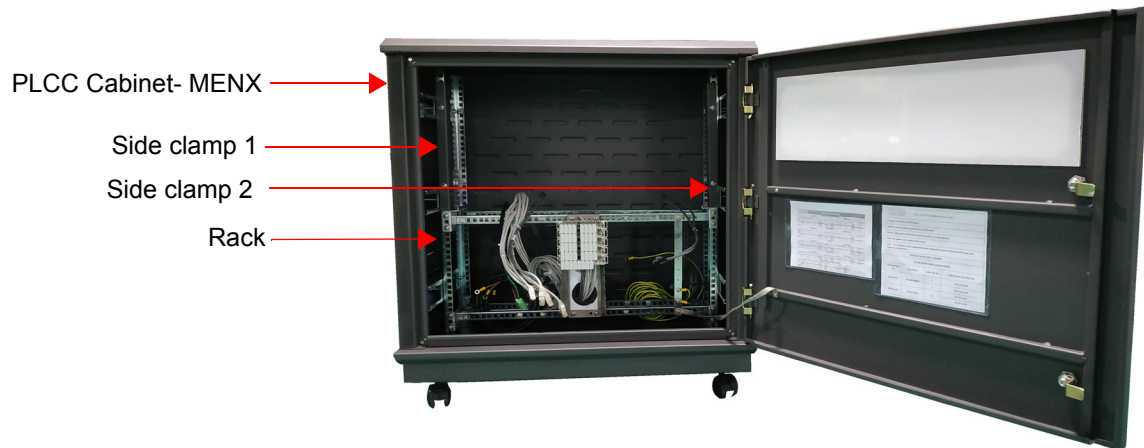
- There is a rack structure affixed to the PLCC Cabinet and attached to this rack are the two screw-fitted side clamps. The rack structure is used for holding the system in the cabinet with the help of the side clamps.

- To mount the system on the rack, unscrew the front two screws of each side clamp and keep the screws and nuts aside.

Unscrew the side clamp screw 1

Unscrew the side clamp screw 2
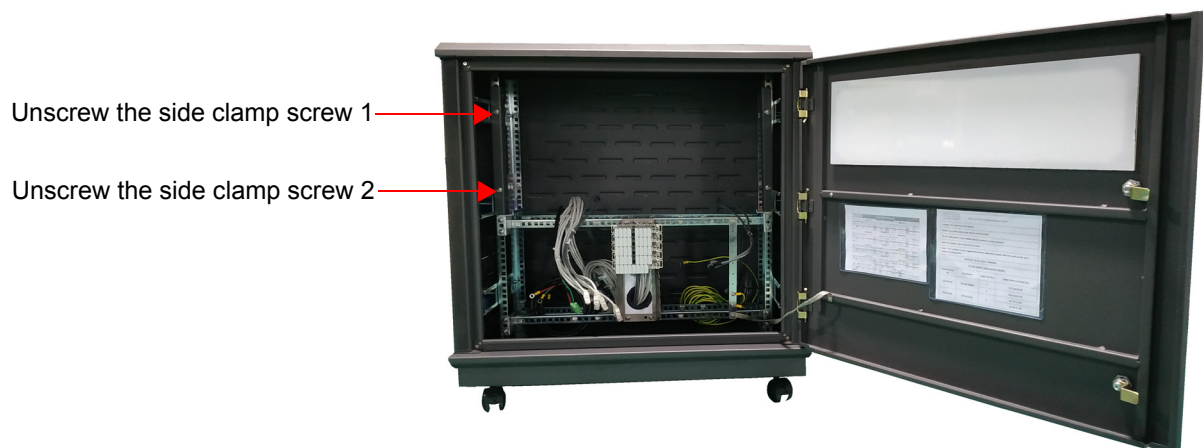
- The diagram of the side clamp is illustrated below.

- Now, unscrew the screws fitted on both the sides of ETERNITY MENX16SDC and keep them aside. There are two screws fixed on each side of ETERNITY MENX16SDC.

System screw 1

System screw 2
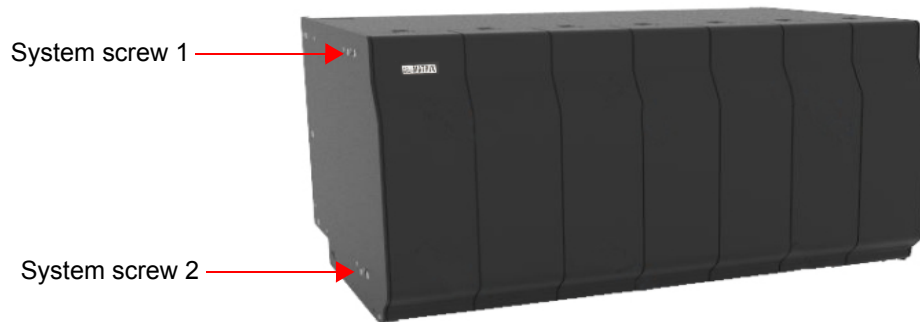
- Place the side clamp on the edge of ETERNITY MENX16SDC and match the holes present on the side clamps with the holes present on ETERNITY MENX16SDC perfectly. Secure the side clamp to the edge of ETERNITY MENX16SDC with the help of the system screws. Similarly, fix the second side clamp to the other edge of ETERNITY MENX16SDC.

Side clamp

Side clamp

- Lift the system and mount it on the rack affixed in the PLCC cabinet. Now, match the holes present on the side clamps with the holes present on the rack and secure ETERNITY MENX16SDC to the rack with the help of the side clamp screws and nuts. ETERNITY MENX16SDC is affixed in the PLCC Cabinet.

System

PLCC Cabinet

Rack

MDF
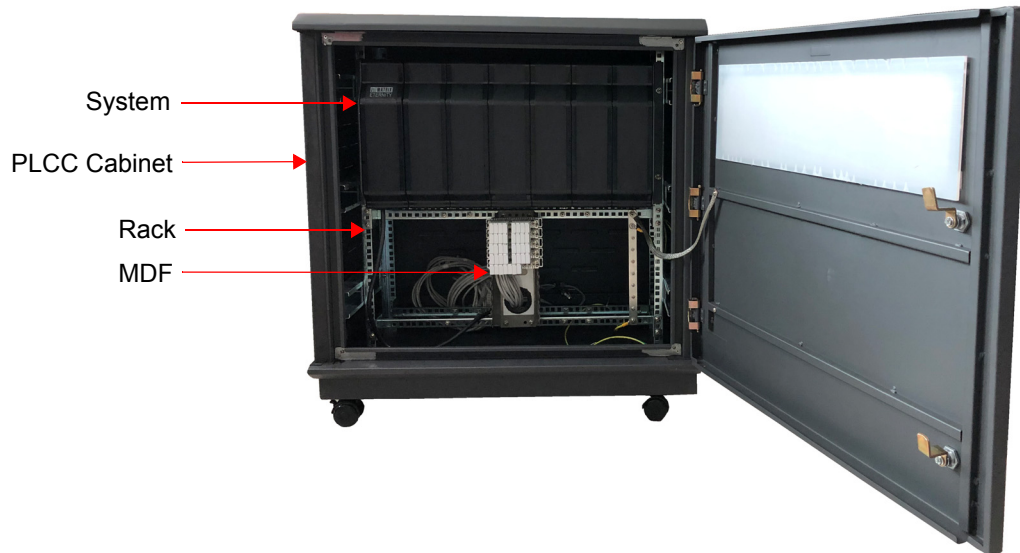
- There is an integrated MDF present beneath the rack. The MDF firmly holds the termination module for the trunk and extension cables.

- The Trunk line cables from ETERNITY MENX16SDC are to be terminated into the 'Trunk Lines' side of the MDF using a punch tool for Krone modules.

- Similarly, the Extension cables from ETERNITY MENX16SDC are to be terminated into the 'Station Lines' side of the MDF using the punch tool for Krone modules.

You may label the trunk and extension line cables for easy identification. You can also keep a record of the trunk and extension lines in an updatable format.

The number of Trunk line cables and Extension cables integrated between ETERNITY MENX16SDC and the MDF is created as per the order received from the customers.
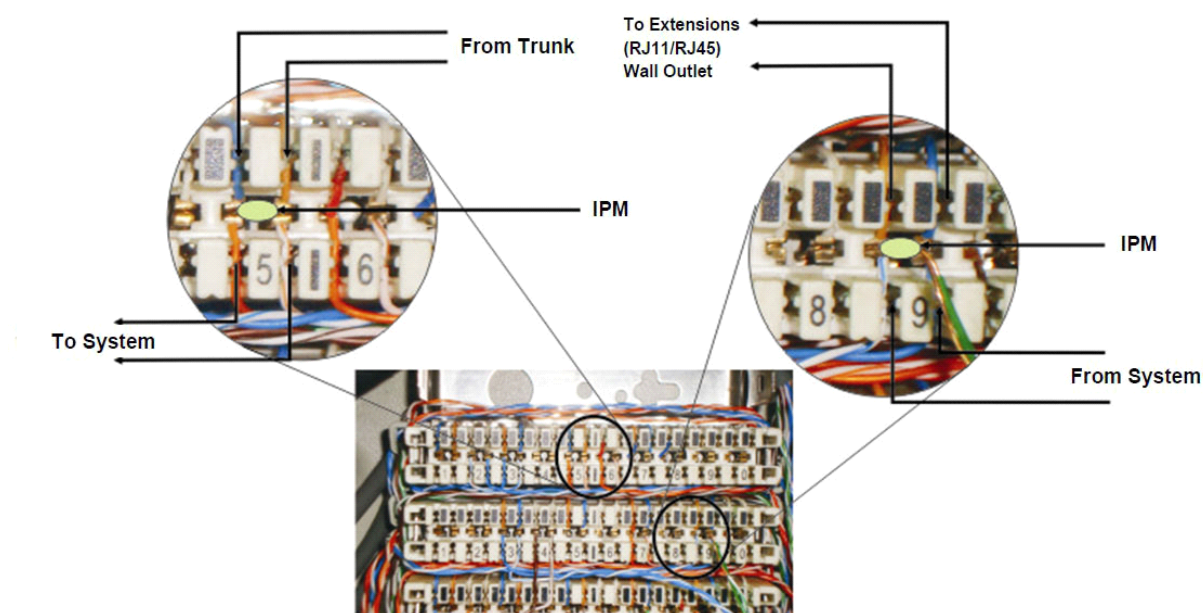
- Extend the cables terminated at the 'Station Lines' side of the MDF to the desired extensions through the circular outlet present at the bottom of the cabinet.

  Similarly, pull-out the cables of the trunk from the circular outlet present at the bottom of the cabinet to the 'Trunk Lines' side of the MDF.

Earthing
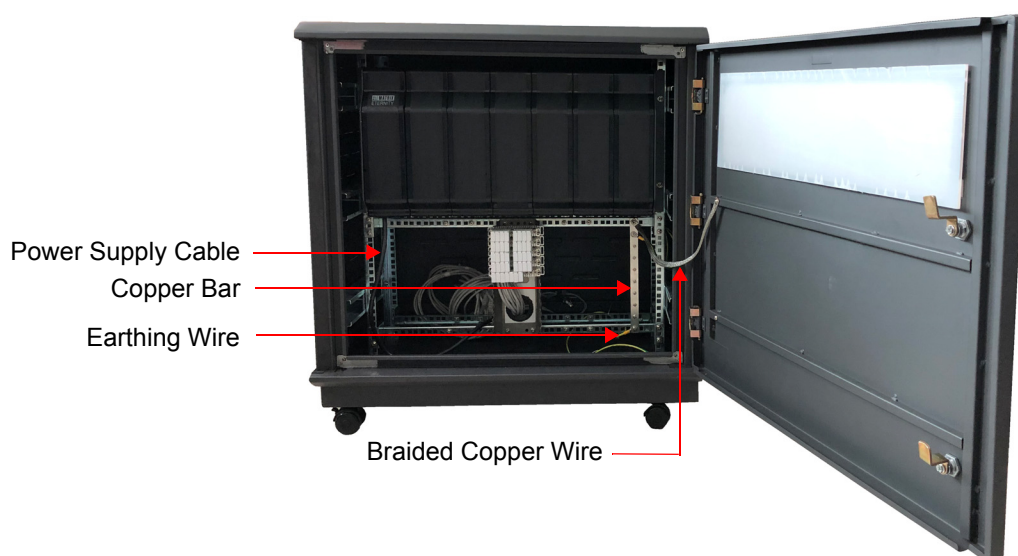
Keeping in mind, the safety of the product and the person handling it, a dedicated copper bar is provided to protect the unit from the extremely high voltage currents. The copper bar is affixed in the rack with the help of the screws.

The door of the cabinet is also connected with the copper bar through a braided copper wire so as to provide proper earthing provision.

You must connect the earthing wire (yellow-green) present at the edge of the ETERNITY MENX16SDC with the copper bar. To do so, stretch the earthing wire from the system and terminate it into the copper bar and connect this copper bar with Telecom Earth (present in your premises). Now, pull-out the earthing wire from the circular outlet present at the bottom of the cabinet and connect it to the Telecom Earth (present in your premises).

> In case, you need to extend the earthing wire, then make sure you use the earthing wire that has a protective bonding copper conductor with 10/12 AWG.

The below diagram depicts the importance of earthing in electronic products.
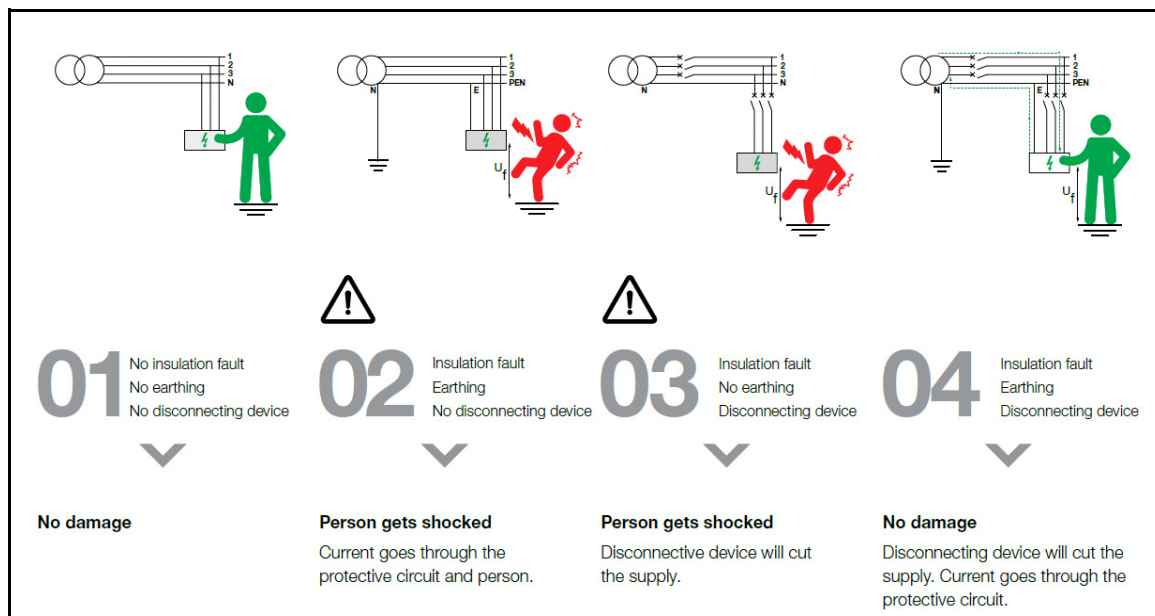
Power Supply

The System should be operated with a proper supply voltage. A dedicated Power supply outlet close to the system must be arranged. The Power supply for the system must be separate from other heavy electrical loads like Air-conditioners, heaters, welding machines, electrical motors, etc.

ETERNITY MENX16SDC[1] is designed to work with an input voltage of 48VDC(500W).

You must also pull-out the Power Supply Cable of the System from the circular outlet present at the bottom of the cabinet and connect it to a reliable Power Supply Source.

You can now configure the system to access the features and facilities provided by the system. To know how to configure the System, refer to the chapter *Configuring ETERNITY GENX* in SARVAM UCS System Manual.

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1. *ETERNITY GENX12SDC works with an input voltages of 48VDC (250W).*

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Some important precautions are listed below that must be followed while handling the System.

- **Power Disconnection Warning**

  Before working on a system that has an on/off switch, turn OFF the power and unplug the power cord.

- **ISDN Connection Warning**

  The ISDN connection is regarded as a source of voltage that should be inaccessible to user contact. Do not attempt to tamper with or open any public telephone operator (PTO)-provided equipment or connection hardware. Any hardwired connection (other than by a non removable, connect-one-time-only plug) must be made only by PTO staff or suitably trained engineers.

- **Before Making Telecommunication Network Connection**

  High leakage current — permanent earth connection essential before making Telecommunication Network Connection.

- **SELV Circuit**

  To avoid electric shock, do not connect safety extra-low voltage (SELV) circuits to telephone-network voltage (TNV) circuits. LAN ports contain SELV circuits, and WAN ports contain TNV circuits. Some LAN and WAN ports both use RJ-45 connectors. Use caution when connecting cables.

- **Product Disposal**

  Ultimate disposal of this product should be handled according to all national laws and regulations.

- **Port Connections**

  For connections outside the building where the equipment is installed, the 10/100/1000 Ethernet ports must be connected through an approved network termination unit with integral circuit protection.

Appendix

Supported Cards

ETERNITY MENX16SDC	ETERNITY GENX12SDC
ETERNITY ME Card SLT32	ETERNITY GE Card SLT20
ETERNITY ME Card SLT16	ETERNITY GE Card SLT16
ETERNITY ME Card SLT8	ETERNITY GE Card SLT8
ETERNITY ME Card DKP32	ETERNITY GE Card DKP16
ETERNITY ME Card DKP16	ETERNITY GE Card DKP8
ETERNITY ME Card DKP8	ETERNITY GE Card DKP16LL
ETERNITY ME Card DKP16LL	ETERNITY GE Card DKP4+SLT16
ETERNITY ME Card CO8+SLT24	ETERNITY GE Card CO4+DKP2+SLT12
ETERNITY ME Card CO16	ETERNITY GE Card CO4+DKP2+SLT8
ETERNITY ME Card CO8	ETERNITY GE Card CO2+DKP2+SLT16
ETERNITY ME Card T1E1PRI DUAL	ETERNITY GE Card CO4+SLT16
ETERNITY ME Card T1E1PRI SINGLE	ETERNITY GE Card CO16
ETERNITY ME Card E1FOPRI DUAL	ETERNITY GE Card CO8
ETERNITY ME Card E1FOPRI SINGLE	ETERNITY GE Card T1E1PRI SINGLE
ETERNITY ME Card GSM8	ETERNITY GE Card E1FOPRI SINGLE
ETERNITY ME Card GSM8 3G	ETERNITY GE Card GSM4
ETERNITY ME Card GSM8 4G (E/AUT/A/V)	ETERNITY GE Card GSM4 3G
ETERNITY ME Card E&M8	ETERNITY GE Card GSM4 4G (E/AUT/A/V)
ETERNITY ME Card E&M4	ETERNITY GE Card E&M4
ETERNITY ME Card RIC4	ETERNITY GE Card RIC4
ETERNITY ME Card PS48VDC-500 Watts	ETERNITY GE Card PS48VDC
ETERNITY ME Card DATA4	ETERNITY GE Card DATA4
ETERNITY MENX-LENX Card CPU	ETERNITY GENX Card CPU
NX DBM VOCODER64	NX DBM VOCODER64
NX DBM VMS64	NX DBM VMS64

E-Waste Management

Disposal of Products/Components after End-Of-Life

Main components of Matrix products are given below:

- **Soldered Boards:** At the end-of-life of the product, the soldered boards must be disposed through e-waste recyclers. If there is any legal obligation for disposal, you must check with the local authorities to locate approved e-waste recyclers in your area. It is recommended not to dispose-off soldered boards along with other waste or municipal solid waste.

- **Batteries:** At the end-of-life of the product, batteries must be disposed through battery recyclers. If there is any legal obligation for disposal, you may check with local authorities to locate approved batteries recyclers in your area. It is recommended not to dispose off batteries along with other waste or municipal solid waste.

- **Metal Components:** At the end-of-life of the product, Metal Components like Aluminum or MS enclosures and copper cables may be retained for some other suitable use or it may be given away as scrap to metal industries.

- **Plastic Components:** At the end-of-life of the product, plastic components must be disposed through plastic recyclers. If there is any legal obligation for disposal, you may check with local authorities to locate approved plastic recyclers in your area.

After end-of-life of the Matrix products, if you are unable to dispose-off the products or unable to locate e-waste recyclers, you may return the products to Matrix Return Material Authorization (RMA) department.

Make sure these are returned with:
- proper documentation and RMA number
- proper packing
- pre-payment of the freight and logistic costs.

Such products will be disposed-off by Matrix.

"SAVE ENVIRONMENT SAVE EARTH"

E-Waste Management and Handling Rules

E-waste is a popular, informal name for electronic products nearing the end of their useful life. E-wastes are considered dangerous, as certain components of some electronic products contain materials that are hazardous, depending on their condition and density. The hazardous content of these materials pose a threat to human health and environment. Discarded electronics products such as circuit boards, batteries, wires and other electronic accessories if improperly disposed can leach lead and other substances into soil and groundwater. Many of electronic products can be reused, refurbished or recycled in an environmentally sound manner so that they are less harmful to the ecosystem.

Benefits of E-waste Recycling leach

Electronics Recycling Conserves Natural Resources

There are many materials that can be recovered from old electronic products. These materials can be used to make new products, thus reducing the need for the new raw materials. For instance, various metals can be recovered from circuit boards and other electronics can be recycled.

Electronics Recycling Supports the Community

Donating your old electronics plays an important role in the provision of refurbished products which can be of great help to certain industries, small organizations and non-profitable organizations. It also helps individuals gain access to technology that they could not have otherwise afforded.

Electronics Recycling Creates Employment Locally

Considering that around 90 percent of electronic equipment is recyclable, electronics recycling can play a significant role in creating employment. This is because new firms dealing with electronics recycling will form and existing firms will look to employ more people to recover recyclable materials. This can be triggered by the increase in the demand for electronics recycling.

Electronics Recycling Helps Protect Public Health and the Environment

Many electronics have toxic or hazardous materials such as mercury and lead, which can be harmful to the environment if disposed in trashcans. Reusing and recycling electronics safely helps in keeping the hazardous materials from harming humans or the environment. For example, certain electronic components and batteries are hazardous since they have lead in them. Printed circuit boards contain harmful materials such as cadmium, lead, mercury and chromium.

Instead of keeping old electronics or dumping them in landfills, recycling or reusing them is an appropriate option that should be supported by individuals and organizations. Considering the benefits of electronics recycling, it is very important that people in various parts around the world embrace this concept.

Creates Jobs

E-waste recycling creates new jobs for professional recyclers and creates a second market for the recycled materials.

Do's & Don'ts

Do's:

- Always look for information on the catalogue with your product for end-of-life equipment handling.
- Ensure that only Authorized Recyclers/Dismantler handle your electronic products.
- Always call at our toll-free No's to Dispose products that have reached end-of life.
- Always drop your used electronic products, batteries or any accessories, when they reach the end of their life at your nearest Authorized E-Waste Collection Points.
- Always disconnect the battery from product and ensure any glass surface is protected against breakage.

Don'ts:

- Do not dismantle your electronic Products on your own.
- Do not throw electronics in bins having "Do not Dispose" sign.
- Do not give e-waste to informal and unorganized sectors like Local Scrap Dealer/ Rag Pickers.
- Do not dispose your product in garbage bins along with municipal waste that ultimately reaches landfills.

E-Waste Management Plan

M/s. MATRIX COMSEC PVT LTD has partnered with **E-Waste Recyclers India (EWRI)** to comply with the new India E-Waste management and handling rules in providing drop-of centers and environmentally sound management of end of life electronics.

EWRI has obtained authorizations from the appropriate governmental agency for their processing facilities. EWRI will receive and recycle customer returned equipment, including all the e-waste. Customers can drop their e-waste in the drop-box provided at various collection centers of EWRI.

A list of collection centers along with the address is mentioned below.

The customers can also call on the following toll free number (1800-102-5679) from Monday to Friday between 10:00 AM to 5:30 PM to get details about the collection centers.

Collection Centers:

State/ City	Location	Logistic	Address	Toll-Free Number
Delhi	Rangpuri	Professional Logistics	Rangpuri, Milakpur Kohi Rangpuri, Rangpuri, New Delhi - 110037	1800-102-5679
Gurugram	Gurugram	Professional Logistics	295, LIG Colony, Sector 31, Gurugram, Haryana - 122022	1800-102-5679
Jharkhand	Dhanbad	Professional Logistics	Sardar Patel Nagar, Dhanbad, Jharkhand - 826004	1800-102-5679
Noida	Salarpur Khadar	Professional Logistics	2, Gejha Rd, Goyal Colony, Salarpur Khadar, Sector 102, Noida, Uttar Pradesh - 201304	1800-102-5679
Mumbai	Vashi	Professional Logistics	Plot-92,gala no 01,Sector 19C Vashi Navi, Mumbai - 400705	1800-102-5679

State/ City	Location	Logistic	Address	Toll-Free Number
Pune	Vallabh Nagar	Professional Logistics	No.3/20,Near Ashok Sah Bank, Vallabh Nagar, S.T.Stand Road, Pimpri, Pune - 302021	1800-102-5679
Odisha	Cuttack	Professional Logistics	Cuttack, Odisha	1800-102-5679
Hyderabad	Secunderabad	Professional Logistics	4,Block-3,4th Shatter at 179, MPR Estates Near Old Check Post Old Bowaenpally Secunderabad, Hyderabad - 500011	1800-102-5679
Bangalore	Yeshwanthpur	Professional Logistics	No.44 1st floor 2nd main D.D.U.T.T.L. Yeshwanthpur, Bangalore - 560022	1800-102-5679
Mangalore	Bhathery Road Boloor	Professional Logistics	Opp. Hindustan Lever Ltd, Sulthan, Bhathery Road Boloor, Mangalore (KA) - 575003	1800-102-5679
Jharkhand	Ranchi	Professional Logistics	Ranchi, Jharkhand	1800-102-5679
Chennai	Sennerkuppam	Professional Logistics	27,Sakthi Nagar Phase-II, Sennerkuppam, Near Bisleri Water Plant, Chennai - 600056	1800-102-5679
Rajasthan	Jaipur	Professional Logistics	A-81, 200 ft. By Pass, Heerapura, Jaipur, Rajasthan - 302021	1800-102-5679
Bokaro	Odisha	Professional Logistics	Cuttack, Odisha, India	1800-102-5679
Guwahati	Kundil	Professional Logistics	HN-34, Kundil Nagar Basistha Chariali, Near Parbhat Apartment, Guwahati - 781029	1800-102-5679
Lucknow	Kanpur Road	Professional Logistics	S-175,Ist Floor Transport Nagar Near RTO Kanpur Road Lucknow - 226004	1800-102-5679
Madhya Pradesh	Indore	Professional Logistics	284 AS-3 Scheme No.-78,Vijay Nagar, Indore, Madhya Pradesh	1800-102-5679
Ahmedabad	Pushp Penament	Professional Logistics	Shop No D-18, Pushp Penament, Behind Mony Hotel, Isanpur, Ahmedabad	1800-102-5679
Patna	Malyanil buddha	Professional Logistics	Dr. A.K Pandey (IPS) Malyanil buddha Colony, Patna (Bihar) - 800001	1800-102-5679
Andhra Pradesh	Vishakapatnam	Professional Logistics	Shop No.8, New Gajuwaka, Opp. High School Road, Vishakapatnam, Andhra Pradesh - 530026	1800-102-5679
Chandigarh	Pharbhat Road	Professional Logistics	Shop no:-19, Pharbhat Road, Opp:- Tennis Academy, Zirakpur, Chandigarh, Punjab	1800-102-5679

State/ City	Location	Logistic	Address	Toll-Free Number
Kolkata	B.T. ROAD DUNLOP	Professional Logistics	156A/73, Northern Park, B.T. Road Dunlop, Kolkata -700108	1800-102-5679
Odisha	Bhubaneswar	Professional Logistics	Acharya Vihar - jaydev Vihar Rd, Bhubaneswar, Odisha	1800-102-5679
West Bengal	Asansol	Professional Logistics	Shop No-4 Asansol Station Bus Stand Road, Munshi Bazar, Asansol, West Bengal - 713301	1800-102-5679

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