MATRIX
TELECOM SOLUTIONS

Hearty Welcome

Matrix GSM Family

- GSM FCTs (Data ,Voice and FAX Services)
- Multi-Port GSM-FXO-FXS Gateways
- Multi-Port GSM-ISDN BRI Gateways

Pre-eminent Features

- Reliable, Compact and Sturdy Design
- ETSI GSM Phase 2/2+ Compliance
- Superior Call Routing Techniques
- Quad-band 2G and Tri-band 3G Network Support
- CE, FCC15 and RoHS Certified
- Compatible With Any Make of PBX

Matrix SIMADO GFXD1111S

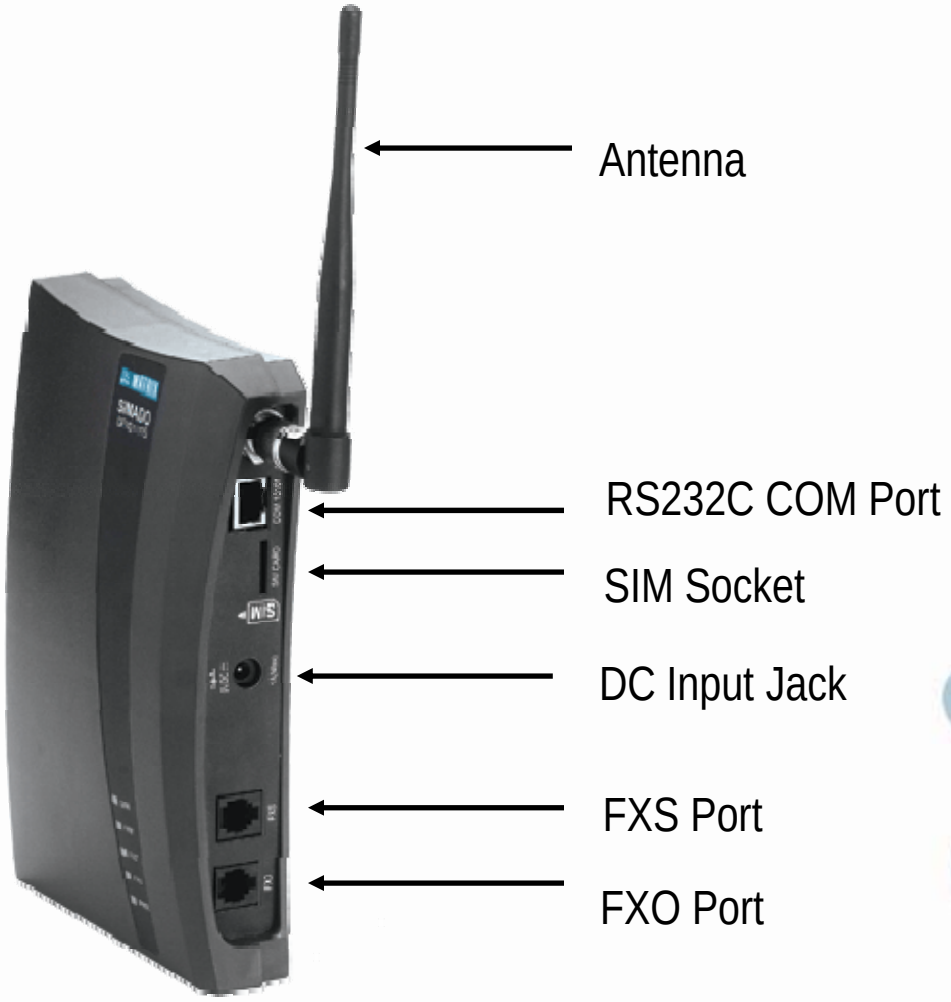
MATRIX SIMADO GFXD1111S

GSM/3G to FXS and FXO Router

Introduction

- 3G/2G Voice FCT, G3 FAX and Class 10 GPRS Data Router
- Gateway to Interface GSM and POTS Networks
- PBX Users Can Establish Calls on GSM Network Directly
- Incoming Calls on GSM Port Can Land on Desired PBX Extension
- Can be Used in Stand-alone Mode
- Can be Used With Any Brand of Existing PBX
- Powerful Least Cost Router

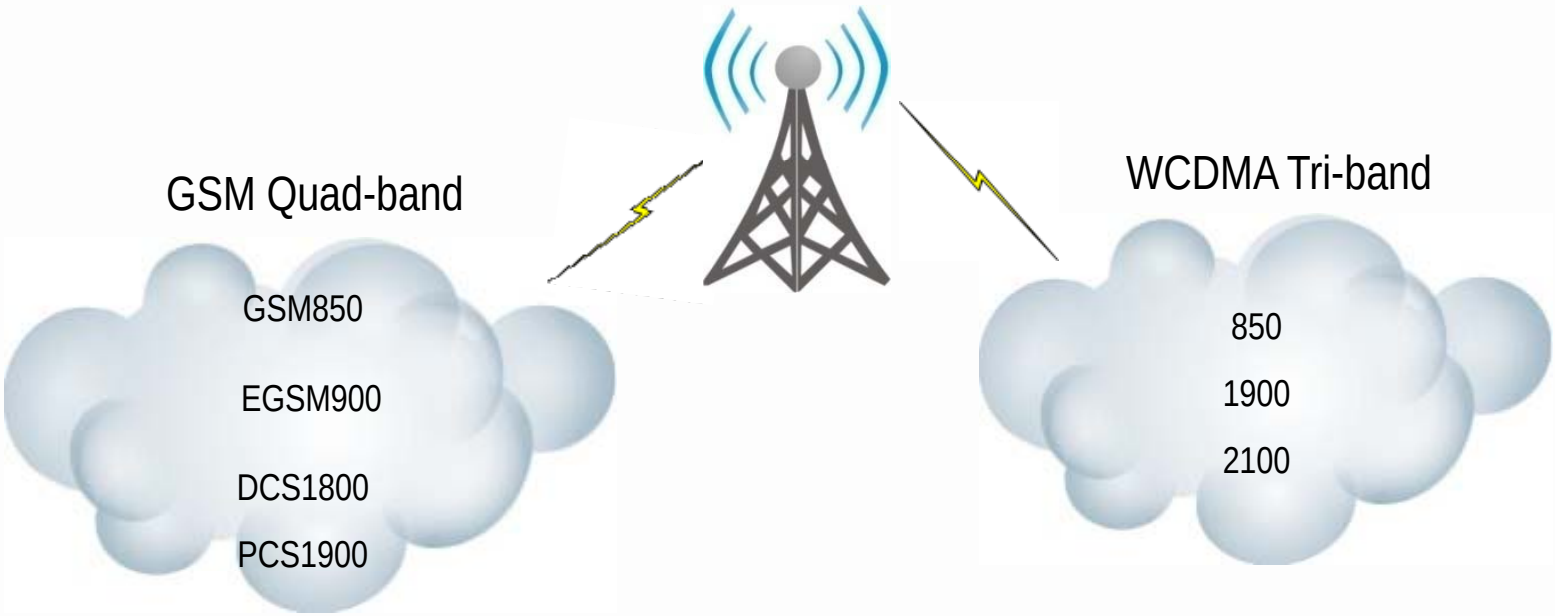
System Interfaces



System Models

SIMADO GFXD1111S	GSM FCT Router For Voice and Data Applications With 1 GSM Port, 1 FXO Port, 1 FXS Port and 1 RS232C Port
SIMADO GFXDS111S 3G	GSM/3G FCT Router For Voice Applications With 1 GSM Port, 1 FXO Port, 1 FXS Port and 1 RS232C Port With 3G Network Support

Network Support



3G Network Support

- Matrix SIMADO GFXD1111S 3G Model Supports:
  - ✓ 2G Network: Quad-band Support For GSM Network
  - ✓ 3G Network: Tri-band Support For WCDMA Network
- Call Established over 3G Network Offer:
  - ✓ Noise-free, Stanch Voice Quality
  - ✓ Enhanced Security
- Fallback Compatibility
  - ✓ In Case Preferred (3G) Network is Not Available
  - ✓ Flexibility to Switchover to Alternate Network (2G)
  - ✓ Assures Network Connectivity Round-the-Clock
  - ✓ Users Can Traverse between Regions Uninterruptedly

2001
Japan Used WCDMA as a Commercial Service, Bypassing Earlier GSM Generations
Source: Mobile Communications Systems and Security/Man Young Rhee

LED Indications

FXS	Dual-Color LED Indicating FXS Port Status
FXO	Dual-Color LED Indicating FXO Port Status
Network	1 LED to Indicate GSM Network Status
SIM	1 LED to Indicate SIM Status
Power	1 LED For On/Off Status

Real Time Clock (RTC)

- Built-in RTC Circuit
- Ensures Accurate Functioning of System Features Like:
  - ✓ Time Table (Routing Calls as per Time), Setting Alarms, Call Reports and Many Others
- The System's RTC Automatically Tunes With a Country's Day Light Saving Adjustment

Key Features

- Abbreviated Dialing
- Allowed and Denied List
- Answer Signaling on FXS Port
- Automatic Number Translation
- Call Divert
- Call Duration Display
- Calling Line Identification Presentation (CLIP)

Key Features

- Call Minutes
- Calling Party Control(CPC)
- Call Progress Tones and Rings
- Disconnect Signaling on FXS Port
- Emergency Number Dialing
- FAX Service
- GPRS
- Hotline

Key Features

- IMEI Number
- Least Cost Routing (LCR)
- Location Information Indication
- Multi-stage Dialing
- Network Selection
- Port Release Timer
- Reinstate Default Settings
- Short Message Service (SMS)

Key Features

- Signal Strength Indication
- SIM PIN
- Software Version and Revision Display
- System Programming
- System Restart
- System Reports
- System Security

Abbreviated dialing

- 32 Frequently Used Numbers Can be Stored in the System's Internal Memory
- Shorter Codes Can be Defined For these Numbers
- Shorter Codes are Easier to Remember and Dial
- Also Termed as Speed Dialing

Allowed and Denied Lists

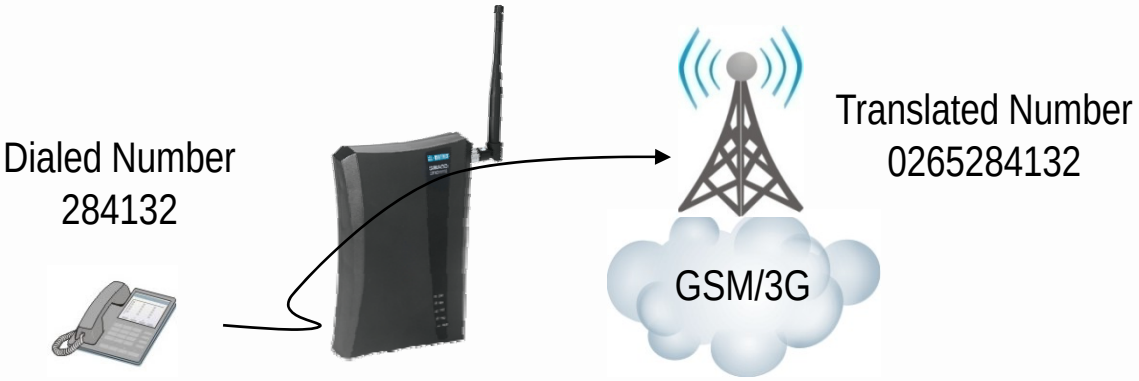
- Allow/Deny Dialing of Specific Numbers
- An Allowed/Denied Number List Can be Programmed For Each System Port
  - ✓ Each List Can be Programmed to Allow/Deny 32 Numbers
- Programmed Emergency Numbers are Excluded From Such Verification
- Useful to Control Telephone Call Cost
- Limit Use of System National/International Dialing Facility as per Requirement

Answer Signaling on FXS Port

- When Called Party Answers a Call (i.e. on Call Maturity)
- The Signal (In Form of Polarity Reversal) is Generated on FXS Port
- SIMADO GFXD1111S, When Connected With a Payphone or FXO Port of the PBX
- It is Obligatory to Generate Call Maturity Information on the FXS Port
- This Assists the Connected (Payphone or PBX) in Accurate Billing
- Ensures, All Matured Calls are Billed
- Evades Billing Unanswered/Unsuccessful Call Attempts

Automatic Number Translation

- Translates Dialed Number String to a Format Understood by the GSM/3G Network, Example:
  - ✓ While Placing Calls to Landline Numbers
  - ✓ User May Dial Only the Number
  - ✓ SIMADO GFXD1111S, Prefixes the Area Code
  - ✓ The Number String Can then be Understood by the GSM Network
- No Need to Change Habituated Dialing Practices
- Aids in Speed Dialing and Multi-stage Dialing Set-ups



Call Divert

- Divert Incoming Calls of a GSM Port to Another GSM or FXO Port under Various Conditions Such as:
  - ✓ When Called Party is Found Busy
  - ✓ In Case of No-reply
  - ✓ Called Party is in No-coverage Area
  - ✓ Divert Calls Unconditionally

Call Duration Display

- Duration of Calls Made/Received on FXS Port Can be Viewed in LCD Display of End User Equipment
- Display Options:
  - ✓ Duration of Last Dialed/Received Call
  - ✓ Total Duration of Calls Made Through the System

Calling Line Identification Presentation

- Supports CLIP on FXS, FXO and GSM Port
- Program Port to Send/Receive CLIP Using Standards Like:
  - ✓ DTMF, FSK, ITU-T and FSK Bellcore

Call Minutes

- Mobile Service Providers Offer Free Calling Schemes For a Fixed Calling Minutes
- Enable Call Minute Feature on a Mobile Port
- Calls Get Routed Through Mobile Port Programmed For Free Minutes
- Save on Call Cost , Utilizing Available Free Minutes
- On Exhaustion of Free Calling Minutes
  - ✓ Either Block the Calls
  - ✓ Else Calls Can be Allowed After Alerting the Caller
- Reallocate Calling Minutes Automatically on a Scheduled Date
- Consumed Call Minutes Can be Viewed on LCD Display of Connected Telephone Instrument

Calling Party Control(CPC)

- When a Call is Terminated by the Called Party on GSM Network
- System Generates CPC Signal on its FXS Ports
- The Signal is Sensed by the PBX (or Other Equipment) to Release the Ports
- Prevents Port Blockage
- System Detects CPC on FXO Port Also

Call Progress Tones

- Different Tones to Indicate the Progress of Call Activity
- Example: Dial Tone, Ring Back Tone, Busy Tone, Error Tone
- CPT Tones With Difference Cadence is Offered to Match With the Ones Used in a Region

Disconnect Signaling on FXS Port

- When SIMADO GFXD1111S is Connected With a Payphone or FXO Port of the PBX
- The Signal (In Form of Polarity Reversal or Open Loop Disconnect Pulse) is Generated on FXS Port
- The Signal is an Indicator of Call Disconnection From the Called Party End
- Else Call Will be Disconnected Only When Caller Goes On-hook, Resulting in Inaccurate Billing
- Be Assured For Most Accurate Billing

Emergency Number Dialing

- Program Up to 4 Emergency (Ambulance, Police, Fire Brigade and Others) Numbers
- Place Emergency Calls From FXO/Mobile Port
- Place Calls Even if a SIM is not Inserted in the GSM Module
- Placing an Emergency Call is not Subject to Verification With the Allowed-Denied Number List
- In Case, No Emergency Number is Programmed, Emergency Number Stored in the SIM Will be Dialed
- Else Default Emergency Number Stored in the Firmware Will be Dialed

FAX Service on Mobile Port

- Get FAX Facility Activated on SIM by the Service Provider
- Fax Communication Through PC
  - ✓ Using FAX Software Utilities Like WinFax or Mighty Fax
  - ✓ Send/Receive FAX, Interfacing a PC to SIMADO GFXD1111S Via RS232 Communication Port

** This Feature is Supported in SIMADO GFXD1111S*

General Packet Radio Service(GPRS)

- SIMADO GFXD1111S Supports GPRS Class 10 Service
- Once the Service is Activated on the SIM, User Can:
  - ✓ Browse Internet
  - ✓ Check Emails
  - ✓ Chat
  - ✓ Transfer Files

** This Feature is Supported in SIMADO GFXD1111S*

Hotline

- In Cases When a Number is to be Dialed Frequently
- Just Lifting the Handset, the Number Can be Dialed-out
- Delay After Which the Fixed Number Will be Dialed is Also Programmable
- Before Programmed Delay Elapses, Any Other Number Can be Dialed
- Beneficial In Point-to-Point Connectivity Set-ups

International Mobile Equipment Identity(IMEI)

- 15/17 Digit Code Used to Identify a GSM Module on GSM Network
- When System is Switched on, the IMEI Number is Verified With the Service Providers List of Authorized Users
- In Case of Lost/Stolen Equipment
  - ✓ Get IMEI Number Blocked
  - ✓ Prevents Misuse of Information Stored in the Gateway

Least Cost Routing(LCR)

- Routes Calls Either on GSM or FXO Port
- LCR Schemes Offered:
  - ✓ Time based LCR
  - ✓ Number based LCR
  - ✓ Mixed LCR
- Minimizes Communication Cost Greatly

LCR-Time Based

LCR-TIME ZONE BASED 01-01-2009(Thu) AT 18:05

ID	START TIME	END TIME	PREFERENCE	
			1ST	2ND
01	00:00	23:59	MOB	FXO
02	00:00	23:59	MOB	FXO
03	00:00	23:59	MOB	FXO
04	00:00	23:59	MOB	FXO
05	00:00	23:59	MOB	FXO
06	00:00	23:59	MOB	FXO
07	00:00	23:59	MOB	FXO
08	00:00	23:59	MOB	FXO
09	00:00	23:59	MOB	FXO
10	00:00	23:59	MOB	FXO

- Time based LCR is Useful When Different Service Providers Offer Different Call Rates as per “Time of the Day”

LCR-Number Based

LCR-NUMBER BASED 01-01-2009(Thu) AT 18:06

NUMBER ID	NUMBER	PREFERENCE	
		1ST	2ND
001	12	MOB	FXO
002	0265	MOB	FXO
003		MOB	FXO
004		MOB	FXO
005		MOB	FXO
006		MOB	FXO
007		MOB	FXO
008		MOB	FXO
009		MOB	FXO
010		MOB	FXO

- Number based LCR is Useful When Different Service Providers Offer Different Call Rates as per “Called Area/Called Number”

LCR-Mixed

LCR-MIXED 01-01-2009(Thu) AT 18:07

ID		001		002		003	
NUMBER		98					
ID	START TIME	END TIME	SERVICE PROVIDER SP1	SERVICE PROVIDER SP2	SERVICE PROVIDER SP1	SERVICE PROVIDER SP2	SERVICE PROVIDER SP1	SERVICE PROVIDER SP2
01	00:00	23:59	MOB	FXO	MOB	FXO	MOB	FXO
02	00:00	23:59	MOB	FXO	MOB	FXO	MOB	FXO
03	00:00	23:59	MOB	FXO	MOB	FXO	MOB	FXO
04	00:00	23:59	MOB	FXO	MOB	FXO	MOB	FXO
05	00:00	23:59	MOB	FXO	MOB	FXO	MOB	FXO
06	00:00	23:59	MOB	FXO	MOB	FXO	MOB	FXO
07	00:00	23:59	MOB	FXO	MOB	FXO	MOB	FXO
08	00:00	23:59	MOB	FXO	MOB	FXO	MOB	FXO

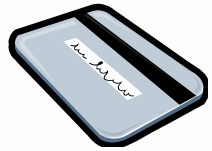
- Mixed LCR is Useful When Different Service Providers Offer Different Call Rates as per “Called Area” and “Call Timing”

Location Information Indication

- Displays Location Information Where SIMADO GFXD1111S is Installed Currently
- Information Can be Viewed on LCD of a Phone
- Feature Requires Activation by the Service Provider
- A Feature For the People on Move
  - ✓ Logistics and Transportation Vehicles

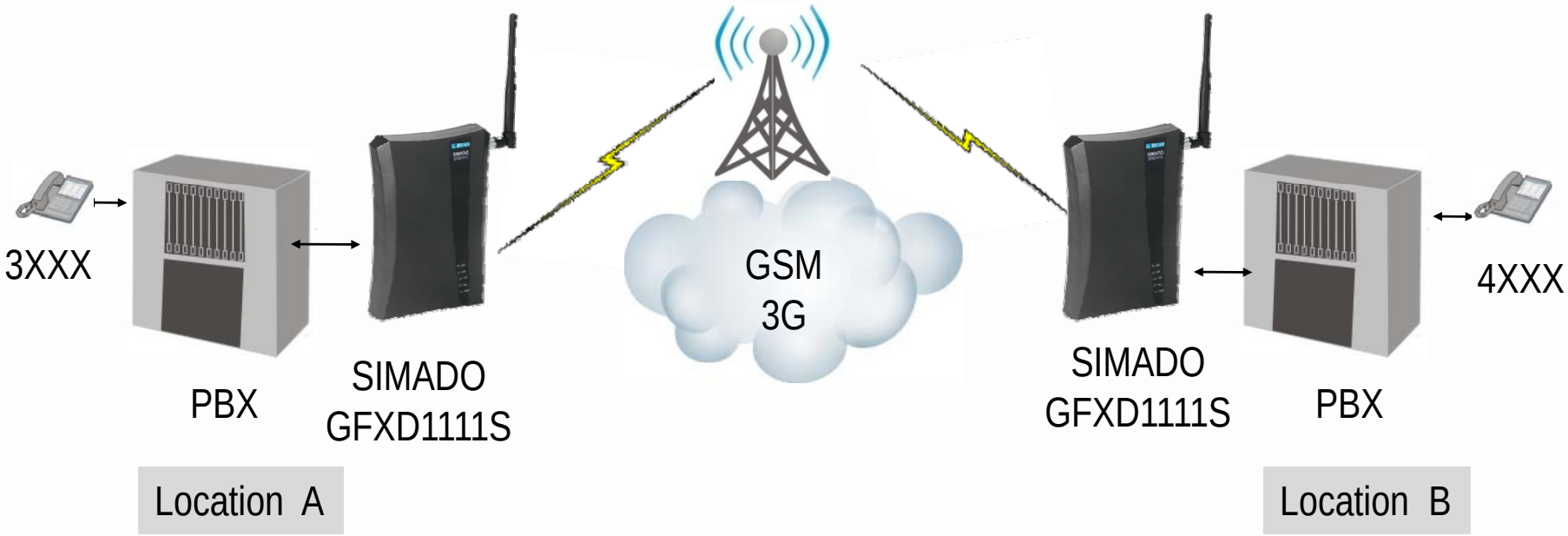
Multi-Stage Dialing

- At Times Series of Number are to be Dialed Before Dialing the Actual Number
- Example: When Using a Virtual Calling Cards (ITC Card)



  - ✓ User is Required to Dial Long Number Strings
    - ➢ A Toll-free Number Provided by the Service Provider+ ITC Card Number +Destination Number to be Called
  - ✓ With Multi-stage Dialing Feature, Eliminate Dialing the Long Number Strings
  - ✓ Program the ANT Table, Calling Card Password Table and the Calling Card Service Provider Table
  - ✓ User Will then be Required to Dial Only the Destination Number

Multi-Stage Dialing: Application Scenario

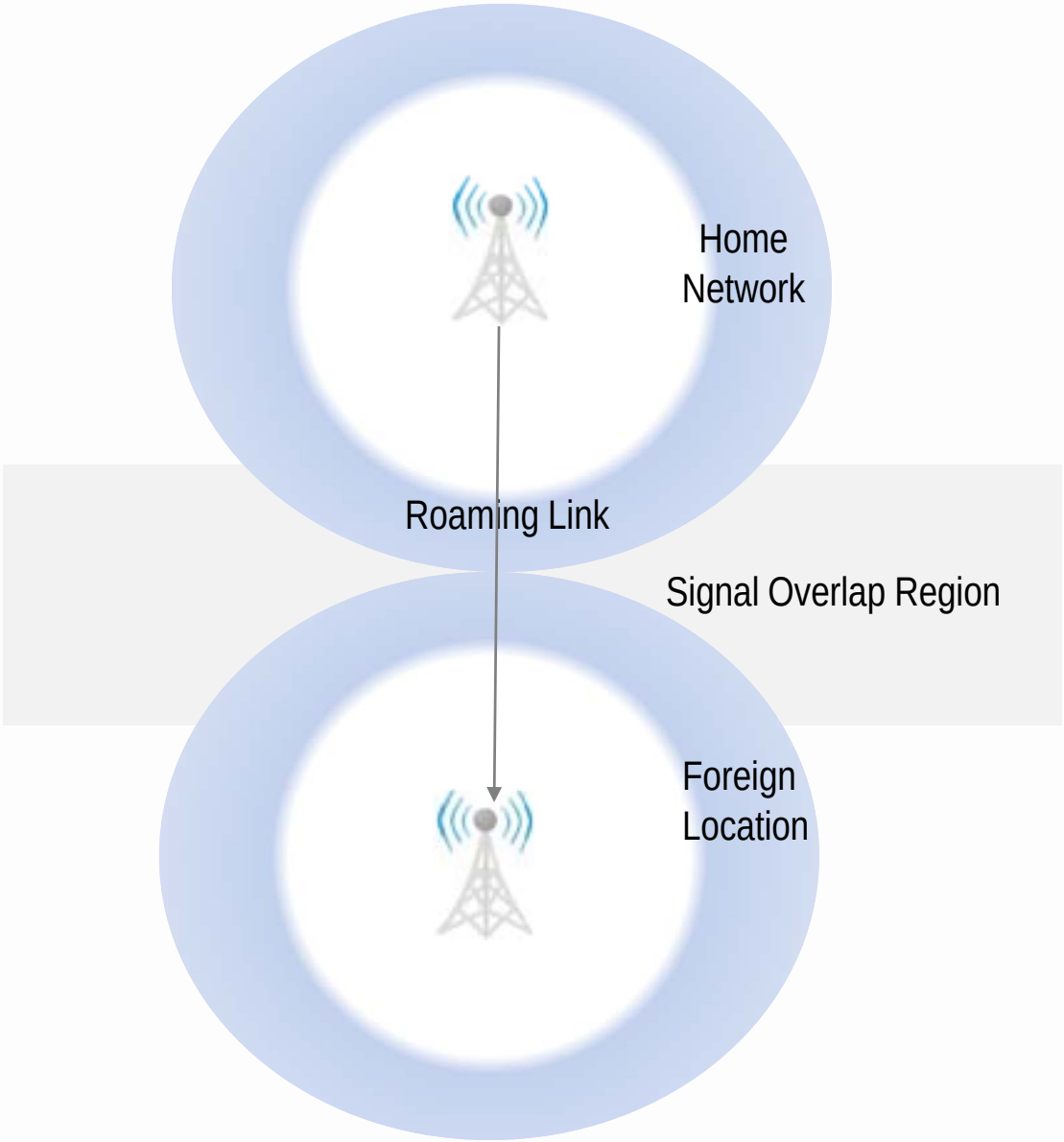


- For Organizations With Multiple Branch Offices
- Link Various Locations Via GSM Network
- Connect SIMADO GFXD1111S in Front of the Pre-installed PBX System
- Avail CUG (Closed User Group) Services From the Service Provider For Free Dialing Between the Offices
- Call Originated For 4XXX Destination, From Location A , Lands on 4XXX at Location B
- Call Originated For 3XXX Destination, From Location B , Lands on 3XXX at Location A
- System Supports Differentiated Tones to Indicate Various Dialing Stages

Network Selection

- At Each Power-On, System Auto Searches and Registers With Available Network (Automatic Network Selection Mode)
  - ✓ Network is Selected as per Network Signal Strength
  - ✓ Ensures Round-the-Clock Connectivity by Registering With the Available Network
- System Can be Programmed For Manual Network Selection Mode
  - ✓ Avoids Unnecessary Charges Due to Registration With Unwanted Networks
  - ✓ Network is Selected as per Assigned Priority in a Priority Table
- The GSM Port Can be Programmed For Maximum of 4 Networks
- Multiple Attempts are Made to Register With an Available Network

Network Selection



- Network Signals may Overlap in the Expanse of a National Border
- Set the System For Manual Network Selection Mode
- Avoid False Roaming Charges, Due to Registration With a Foreign Network

Port Release Timer

- Port Release Timer is Started When a Call Gets Matured
- When the Timer Expires, Ports Involved in the Call are Released
- Prevents Port Blockage, In Case:
  - ✓ Disconnect Signal Sent by the Network is Not Sensed by the System (Mobile/FXO) Port

Reinstate Default Settings

- SIMADO GFXD1111S is Supplied With Default Settings For Various Parameters
- A Programming Error or an Operating Mistake may Necessitate Defaulting the System
  - ✓ Default the System, After Entering SE Mode From a Telephone Instrument
- Minimizes Programming Labor

Short Message Service(SMS)

- Send/Receive SMSs
- SMSs Can be Read on PC/LCD of a Telephone Instrument

** This Feature is Supported in SIMADO GFXD1111S*

Signal Strength Indication

- 15 Step Indication of Signal Strength on Telephone Instrument's LCD (FXS Port)
- Telephone Instrument Should be FSK/DTMF CLI Compatible

SIM PIN

- SIM is a Smart Card With Subscriber Specific Data Stored in it
- SIM PIN is a Security Feature Used by the GSM Network
- A PIN (Personal Identification Number) Check Can be Enabled in the SIM
- At Each Power-On, System is Authenticated For PIN
- This PIN Should Match With the One Stored in SIM as SIM PIN
- System Will Attempt Registration to a GSM Network After Correct SIM PIN is Issued
- Prevents Misuse of the SIM Card

Software Version/Revision Display

- Regular Adherence to Customer Feedbacks Directs Software Upgradation
- Current Software Version Should be Known Before Upgrading to the Higher One
- No Need to Open the System
- View the Software Revision of Current System Software on LCD Screen of Connected Telephone Instrument

System Programming

- Program the System Via:
  - ✓ Program through COM Port
  - ✓ Program through FXS Port
  - ✓ Program through Mobile Port
  - ✓ Programming Via SMS
- Remote Programming:
  - ✓ Program the Port to be Used For Remote Programming, For its Routing Type
  - ✓ Place Call on System Port
  - ✓ System Can be Programmed After Authentication For SE (System Engineer) Password
  - ✓ Diverse Tones to Indicate Various Programming Stages

System Restart

- When Physical Reach to System is Difficult
- Restart the System From the Telephone Instrument (FXS Port)

System Reports

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CONFIGURATION                                              01-01-2009(Thu) AT 09:11
-------------------------------------------------------------------------------
(01) SYSTEM MODE                          :MOB FXS FXO
(02) CALL PROGRESS TONE COUNTRY TYPE      :India
(03) RING COUNTRY TYPE                    :India
(04) SYSTEM PORT RELEASE TIMER            :255 Min
(05) MOB FXO MODE:MOB ROUTING TYPE        :CONNECT & DIAL
(06) MOB FXO MODE:MOB DEST. NUMBER        :
(07) MOB FXO MODE:FXO ROUTING TYPE        :DIAL & CONNECT
(08) MOB FXO MODE:FXO DEST. NUMBER        :
(09) PCO APPLICATION STATUS               :DISABLED
(10) CALL PROGRESS TONE                   :NETWORK TONE
(11) MODIFIED ROUTING                     :DISABLED
(12) SMS BASED CONFIGURATION              :ENABLED
(13) SMS+INT+FAX+DATA MODE-BAUD RATE      :0 (Autobauding)
-------------------------------------------------------------------------------
```

- Generate Reports of Programmed System and Port Parameters
- Eases-out the Troubleshooting Process

System Security

- SIMADO GFXD1111S is Secured With Passwords at Two Levels:
  1) System Engineer (SE) Level
  2) System Administrator (SA) Level
- System Engineer Can Alter SA Password if Required
- Technique to Default SE Password in Case of Forgotten Password
- Prevents Unauthorized Alterations and Misuse of System Features and Facilities

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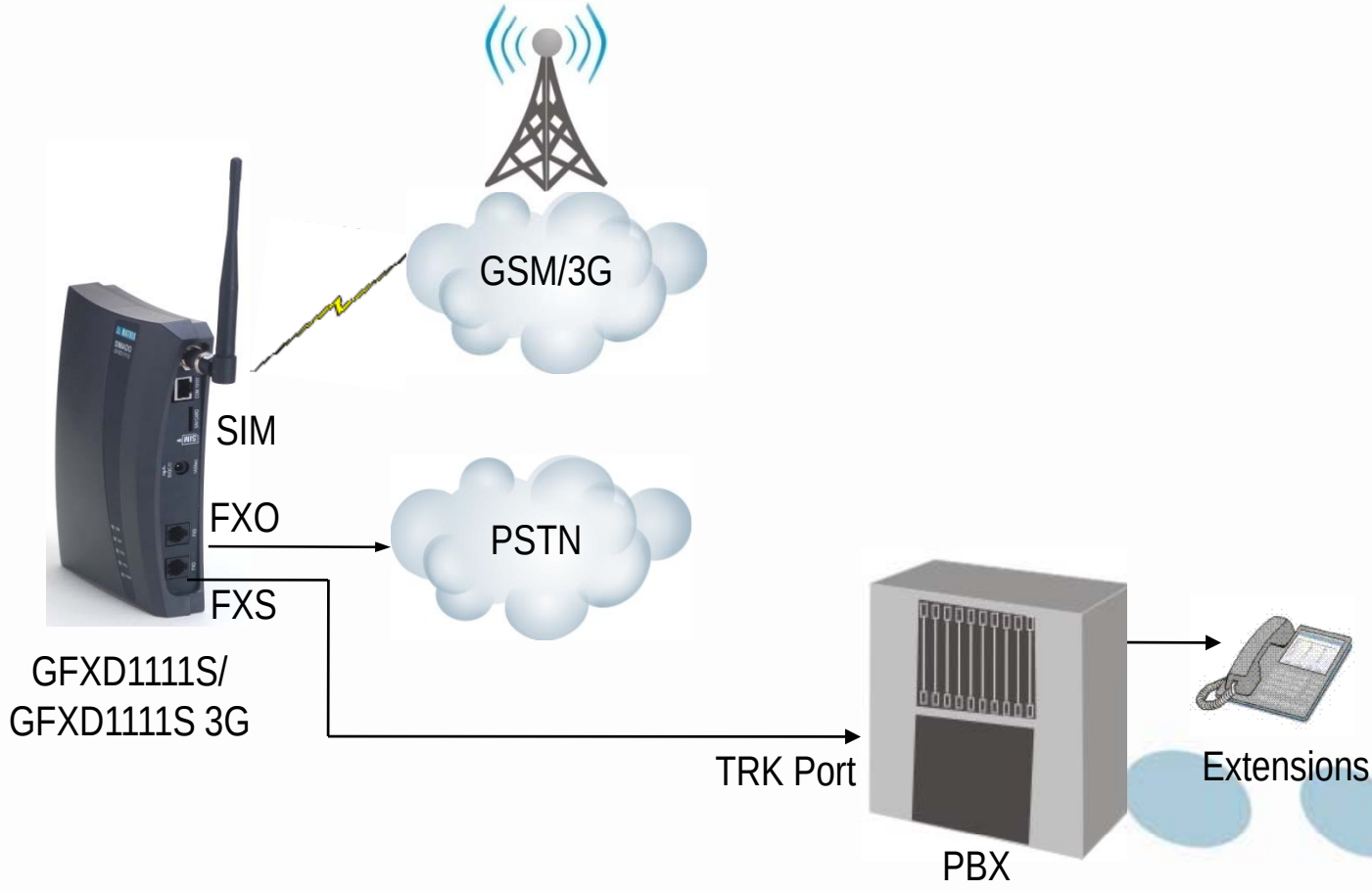
Applications

Stand-alone Application

- Home Users Can Connect to GSM/3G and PSTN Network

With PBX Application



- PBX Users Can Access GSM/3G and PSTN Network, Dialing Trunk Access Codes
- Mobile Users Can Easily Reach-out to the PBX Extensions

Data Application

GFXD1111S

- Use the GSM Network For Internet Connection
- Use PC to Send Bulk SMSs

Technical Specifications

Power Supply	External Adaptor 12V DC/1.25A (Universal input range 90-265VAC, 47- 63Hz)
Power Consumption (Typical)	5 Watt
RF Sensitivity	Better than -106dBm at GSM850/EGSM900/DCS1800/PCS1900 Better than -106dBm at WCDMA 850 Better than -108dBm at WCDMA 1900/2100
Dimensions (W X H X D)	5.26”x7.80”x1.76”
Unit Weight	1200 Grams
Mounting Options	Wall Mount and Table Top
Antenna Connector	TNC(Male)

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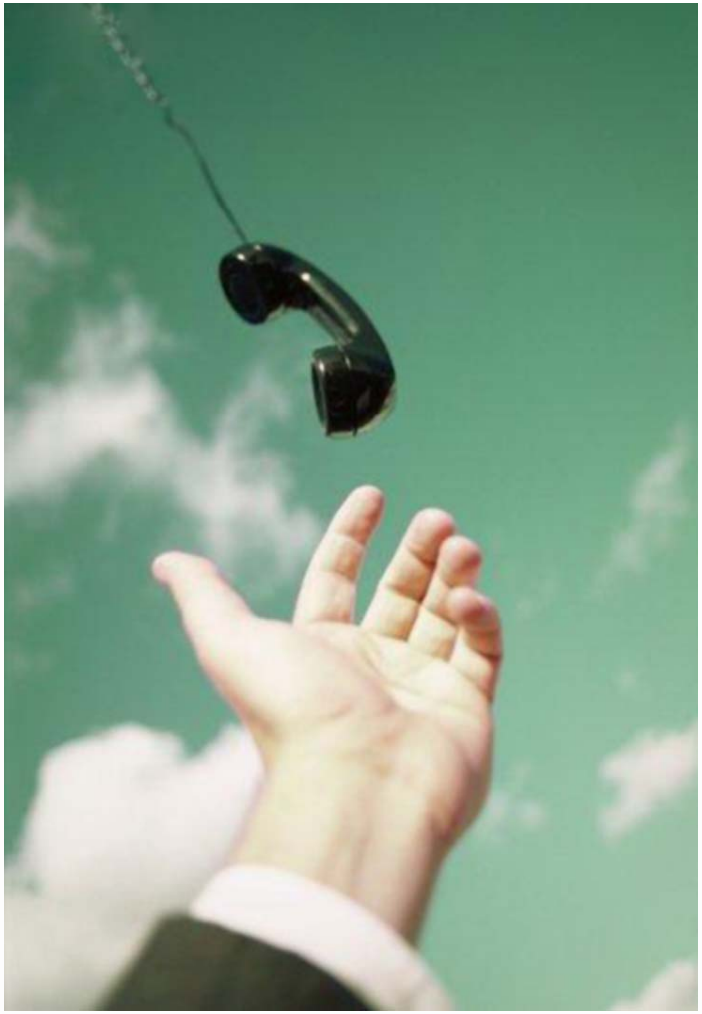

Thank You