



## SETU VFX

4/8-Port VoIP to FXS Gateway

Internet Telephony offers intrinsic benefits of cost and flexibility. At the same time legacy telephony infrastructure and habits cannot be replaced overnight. People desire the best of both worlds - lower cost offered by VoIP and convenience of using existing telephony products and methods.

Matrix SETU VFX is designed to meet these requirements of converting VoIP network to traditional telephony interfaces and vice-versa. It handles all the complexities of VoIP technology internally and provides simple telephone interfaces to make and receive calls.

Let Matrix SETU VFX be your bridge to the new world of IP Telephony!



Matrix SETU VFX is a SIP based Gateway with 8 FXS ports and 1 FXO Lifeline port. It interfaces legacy telephone devices to IP-based networks. It is specially designed for Small and Mid-sized Enterprises to offer them the advantages of low-tariff Internet Telephony for long distance and international calls. It can be used with any existing PBX providing users access to VoIP trunks. It can also be used in a stand-alone mode.

Matrix SETU VFX converts the voice traffic into data packets for transmission over the Internet. When a telephone number is dialed by a user, Matrix SETU VFX converts it into an IP call using the SIP protocol and initiates a call to the called person in any part of the globe. Using an appropriate VoIP service provider, long distance or inter-office call charges can be reduced significantly or eliminated.

Making an outgoing call is as easy as from a normal telephone. Call progress tones like Dial Tone, Ring Back Tone and Busy Tone are fed to the caller as per the called number status. The FXS ports can make outgoing calls on a common or nine different SIP accounts. In addition, number based SIP account selection is provided to select the most economical SIP account for a given outgoing number.

An incoming call from a SIP account can be routed to any one of the FXS ports. All different CLIP protocols are supported so that the user can identify the caller before answering the call.

Once a call is established, features like Call Hold, Call Transfer and Call Forward are supported to manage two calls from the same FXS port. Call Forward in different conditions and Do Not Disturb are also provided.

The FXO Lifeline port allows the user on the first FXS port to selectively dial certain numbers on the PSTN. This line can be used to make emergency or normal calls or when Internet connectivity is not required or unavailable.

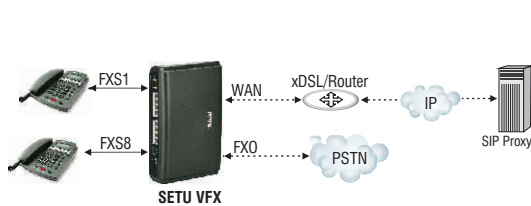
Matrix SETU VFX can be used with any existing PBX without changing the infrastructure. PBX users can make voice calls on IP to avail themselves of the low-tariff of VoIP. The users can continue to make and receive calls without worrying on which network their calls are routed.

Matrix SETU VFX is easy to install and operate. It can be configured using its built-in web pages served by the internal HTTP server.

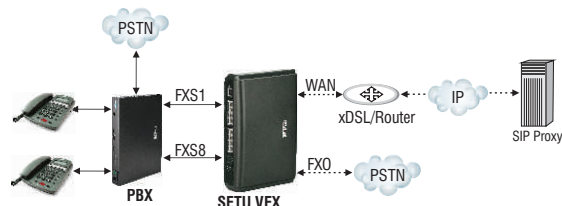
SETU VFX



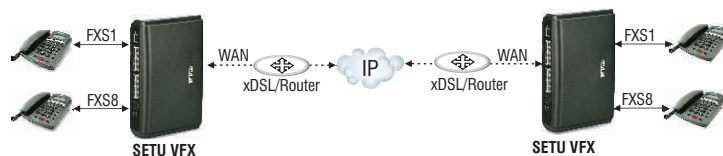
## APPLICATIONS OF SETU VFX



SETU VFX in Residential Application



SETU VFX in Business Application



SETU VFX in Peer-to-Peer Application

## ■ KEY FEATURES

### Access Codes

Matrix SETU VFX uses 3-digit short codes allowing the user to enable/disable features, dial emergency number, access the Lifeline port or to enter in the programming mode. These short codes are known as Access Code that the user dials to access specific features.

### Allowed and Denied List

Allowed and Denied Lists are used to restrict dialing of long-distance and international numbers. A number is blocked if its prefix matches with any entry in the Denied Lists. On the other hand, a number is allowed to go through if it matches with any entry in the Allowed List. This provides flexibility of allowing only specific numbers, blocking all others on FXS ports. SETU VFX offers flexibility of defining 24 such lists containing 64 numbers in each list.

### Automatic Number Translation

The SETU VFX modifies the dialed number or part thereof so that it matches with the numbering plan that is understood by the ITSP. For example, if a user has dialed the number 223344 to call www.abc.com, the SETU VFX adds the appropriate access code "\*777" specified by the ITSP and dials out the number "\*777223344" instead of 223344.

### Blind Call Transfer

The SETU VFX allows the user to transfer the call without talking to the remote user to whom the call is being transferred. The SETU VFX also notifies the user about the failure or success of the transferred call.

### Block Black Listed Callers

SETU VFX allows blocking of incoming calls on SIP accounts from specific addresses, thus shielding users from unwanted junk calls.

### Call Detail Record (CDR)

The SETU VFX stores up to 2000 calls made through the gateway in its internal memory. Reports can be generated using various filters like Port, Number, Date, Time and Duration.

### Call Forward

Matrix SETU VFX provides the user flexibility to forward his calls to a desired destination number. The calls can be forwarded in various conditions like When Busy, When No Reply and Unconditionally.

### Call Hold

Matrix SETU VFX allows the user to put a party on hold to avoid transmission of speech packets as long as the other end is kept on hold.

### Call Progress Tones and Rings

Matrix SETU VFX supports user programmable tones and rings to match those of the region or country standard where it is installed.

### Calling Party Control (CPC)

CPC is required to prevent hanging of the FXS port when it is connected to a device like answering machine, voice mail system, PBX etc. When a call is disconnected from the other side of the Internet, the SIP port is released. The SETU VFX can propagate this call release on the FXS port in the form of Calling Party Control (CPC) signal. The device senses this signal and frees the FXS port.

### Call Waiting

This feature notifies the VFX88L user about another incoming call in wait during an active call.

### Class of Service

This feature allows provision of specific features to be used by specific users only while restricting others from using the same features.

### CLIP

An FXS port can be programmed for any of the three CLIP protocols - DTMF, FSK ITU-T V.23 and FSK Bellcore 212A. The Calling Party Number detected by SETU VFX is presented on the FXS port.

### Compact and Sturdy

Matrix SETU VFX is an integrated gateway equipment. It can be installed on a wall or any table surface.

### Day Light Saving Time (DST)

The Real Time Clock (RTC) of the SETU VFX moves forward or backward automatically in tune with the Day Light Saving requirement of the country where it is installed. The options like Week-Day-Month or Date-Month are provided to move the clock forward and backward automatically on the specified day, date and time.

### Dial Plan

Matrix SETU VFX provides a list of frequently called numbers or part numbers with preferred SIP account for each entry. When a user dials a number, SETU VFX finds the matching number using the "best-fit" logic. It then uses the SIP account given against this matching number to make that call. This ensures lowest cost for all the outgoing calls. SETU VFX allows the creation of 24 such lists and a maximum of 64 Numbers can be stored in each number list. Individual Number List can be created for each FXS port to be used as phone book.

### Emergency Number Dialing

This feature allows the user to dial the emergency number using FXO lifeline port. Four emergency numbers can be stored in the SETU VFX.

### Fax over IP (FoIP)

The Matrix SETU VFX user can send and receive Fax over SIP account, when the FAX machine is connected to the FXS port. The SETU VFX supports FoIP using T.38 Vocoder and Pass Through.

### FXO (PSTN Pass-Through)

SETU VFX FXO (Lifeline) port should be connected to the PSTN or PBX so that the user can make certain calls using this line. The first FXS port can use this port to dial emergency numbers, when the Internet is not available and during power failure.

### Hotline

If a particular number is dialed frequently, it can be programmed as a hotline number. Whenever a user reaches SETU VFX, it waits for some time for the user to dial a number. If the user does not dial any number, VFX88L dials out the hotline number automatically.

### Incoming Calls Routing

Call arriving from any SIP account can be routed to any of the FXS ports.

### Least Cost Routing (LCR)

The SETU VFX selects a port that is offering the least cost for an outgoing call. It supports dialed number based LCR algorithm to select the most cost-effective route.

### LED Indications

Ten dual colour LEDs are provided to represent the functionality of the gateway. Individual LEDs are provided for FXS Ports, Power and System to notify the user about different events.

### MAC Cloning

When replacing the existing hardware with other, you can simplify the installation process by copying the MAC address of your existing PC. In such a case, you do not need to delay the setup process by informing your service provider of newly installed equipment.

### Peer-to-Peer Calling

SETU VFX can make and receive calls from other VoIP users without any Registrar or Proxy servers. Numbers and IP addresses can be assigned to the other VoIP users to provide direct access across the network. SETU VFX provides two dialing options for Peer-to-Peer calling: (i) Peer-to-Peer Number Dialing (ii) IP Address Dialing. Organizations having multiple locations like branch offices and factories can use this feature to provide direct dialing between these end-points.

### PPPoE

Matrix SETU VFX supports PPPoE client and hence can be used with xDSL modems.

### Quality of Service (QoS)

Matrix SETU VFX supports TOS and DiffServe to facilitate improved voice quality.

### Remote Programming

It is possible to change the configuration of the SETU VFX from anywhere in the world if it is assigned a global IP address. The only thing the system engineer needs is access to the internet and a password.

### SIP Accounts

A maximum of 9 SIP accounts can be programmed and each FXS user can be assigned one of the SIP accounts for outgoing calls. Dynamic allocation of SIP account is also possible using the Dial Plan. These SIP accounts can be from multiple service providers or all from a single service provider.

### STUN

This capability allows Matrix SETU VFX to work behind asymmetrical NAT.

### V-LAN Tagging

A Virtual Local Area Network (VLAN) may be defined as a group of LANs that have different physical connections, but which communicate as if they are connected on a single network segment. VLANs increase overall network performance by grouping users and resources that communicate most frequently with each other.

### Web Based Programming

Matrix SETU VFX incorporates built-in HTTP server and web pages for configuration parameters. This web based programming feature helps the user to configure the gateway from any part of the world once it is connected with the IP network.

## TECHNICAL SPECIFICATIONS

### VoIP Channels

Protocol	: SIP v2, SDP, RTP, RFC 2833
Network Protocol	: Ipv4, TCP, UDP, DHCP, SNTP, STUN, HTTP, PPPoE
SIP	: 9 SIP Accounts, Out Bound Proxy Support Display Name, User Name, Password, URL, Proxy URL, Register URL, Register Interval
NAT	: STUN and NAT Keep Alive
Voice Codecs	: G.711 A-Law, m-Law, G.723.1, G.729AB, iLBC, GSM-FR
Line Echo Cancellation	: G.168 with 128ms Tail Length
Call Progress Tones	: Dial Tone, Ring Back Tone, Busy Tone, Error Tone
Voice	: Dynamic Jitter Buffer (Adaptive), Comfort Noise Generation and Voice Activity Detection
Fax	: T.38 and Pass Through
Quality of Service	: Layer 3 Diffserv and TOS
Data Network	: Ethernet Port (RJ45), Auto MDIX 10/100 BaseT
Security	: Password Protected Administration

### FXS (SLT) Port

Connection	: 8 nos. (RJ11)
Off Hook Impedance	: 600W
Loop Limit	: 270W (Max) Excluding telephone set
Loop Feed	: 39mA (Max)
Ringing Voltage	: 55Vrms @25Hz, 3REN
Pulse Dialing	: 10 PPS and 20PPS @ 1:2, 2:3 and 1:1
DTMF Dialing and Reception	: ITUT Q.23 and Q.24
Caller ID Presentation (CLIP)	: DTMF, FSK ITU-T V.23 and FSK Bellcore 212A
Call Maturity	: Polarity Reversal
Protection	: Solid state (Over Voltage and Over Current) built-in Secondary Protection
FXO (Lifeline) Port	: 1no. (RJ11)
LED Indication	: 1 LED for Power, 1 LED for each FXS port and 1 LED for System Status

### Power Supply

Input	: 12VDC @2A through External Adaptor (90-265VAC, 47-63Hz)
Power Consumption	: 5W (Typical)
Connector	: DC Power Jack

### Mechanical

Dimensions (WxHxD)	: 15.5x22.0x3.5cm (6.1"x8.7"x1.4")
Unit Weight	: 1.00Kgs (2.21lbs) Approx.
Shipping Weight	: 2.50Kgs (5.5 lbs) Approx.
Material	: ABS Plastic
Installation Mounting	: Wall and Table-Top

### Environmental

Operating Temperature	: -10°C to +50°C (14°F to +122°F)
Storage Temperature	: -40°C to +85°C (-40°F to +185°F)
Operating Humidity	: 5-95% RH (Non-Condensing)
Storage Humidity	: 0-95% RH (Non-Condensing) at 40°C

## ■ FEATURES LIST

### Hardware Features

- 1 FXO Lifeline Port
- 1 WAN Port (10/100 BaseT)
- 8 FXS Ports
- Compact and Sturdy Design
- Real Time Clock (RTC)
- Wall and Table-top Mounting

### Software Features

- 9 SIP Accounts (Trunks)
- Access Codes
- Automatic Number Translation
- Block Black Listed Calls
- Call Detail Record (CDR)
- Calling Party Control (CPC)
- CLIP (DTMF, FSK-ITU-T V.23, Bellcore 212A)
- Comfort Noise Generation
- Day Light Saving
- DHCP Client
- Dial Plan
- Echo Cancellation Tail Length 128ms
- Emergency Number Dialing
- Fax over IP (T.38 and Pass Through)
- Flexible Incoming Call Routing
- Forward Error Correction (FEC)
- Hotline
- LED Indications
- MAC Cloning

- Password Protection
- Peer-to-Peer Calling
- PPPoE Client
- Programmable Call Progress Tones
- Programmable Ring Tones
- Remote Programming
- Supplementary Services
- Call Forward On Busy
- Call Forward On No Reply
- Call Forward Unconditionally
- Call Hold
- Caller ID
- Call Transfer-Blind
- Call Toggle
- Call Waiting
- Do Not Disturb (DND)
- STUN
- Symmetric RTP
- VLAN Tagging
- Voice Activity Detection
- Web Based Programming

## ■ COMPLIANCES

### EMI/EMC

Conducted Emission	: CISPR 22 Class B
Radiated Emission	: CISPR 22 Class B
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 & Dips	: IEC 61000-4-11

### FCC

Conducted Emission	: FCC Part 15 Sub Part B Class B
Radiated Emission	: FCC Part 15 Sub Part B Class B

### EC Directives

R&TTE 1999/5/EC  
LVD 73/23/EEC  
EMC 89/336EEC

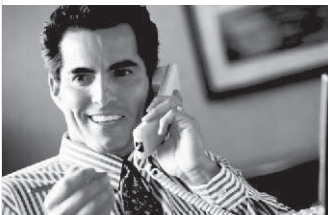
### Safety

IEC 60950 3rd Edition (1999)



## VoIP PRODUCTS FROM MATRIX

ETERNITY IP-PBX	The IP-PBX with Universal Connectivity and Seamless Mobility
SAPEX	All-in-One Embedded IP-PBX Server
VYOM CCX	High-Density SIP Gateway
ETERNITY	The Universal Telephony Gateway
SETU VGFX	Multi-Port SIP based VoIP to GSM-FXO-FXS Gateway
SETU VFXTH	Multi-Port SIP based VoIP to FXO-FXS Gateway
SETU VFX	Multi-Port SIP based VoIP to FXS Gateway
SETU ATA1S	SIP based Analog Telephone Adaptor with 1 FXS Port and 2 Ethernet Ports
SETU ATA2S	SIP based Analog Telephone Adaptor with 2 FXS Ports and 2 Ethernet Ports
SETU ATA211	SIP based Analog Telephone Adaptor with 1 FXO, 1 FXS and 2 Ethernet Ports
SETU ATA211G	SIP based Analog Telephone Adaptor with 1 FXS, 1 GSM and 2 Ethernet Ports
SETU VP248PE	The High-Definition IP-Phone with 6 Lines x 24 Characters LCD Display and PoE
SETU VP248SE	The High-Definition IP-Phone with 2 Lines x 24 Characters LCD Display and PoE
SETU VP248P	The High-Definition IP-Phone with 6 Lines x 24 Characters LCD Display
SETU VP248S	The High-Definition IP-Phone with 2 Lines x 24 Characters LCD Display



## ABOUT MATRIX



An ISO 9001 Company, 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 telecom products like IP-PBX, Universal Gateways, VoIP Gateways and Terminals, GSM Gateways, Access Control and Time-Attendance Systems 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 more than 150,000 customers representing the entire spectrum of industries. Matrix has won many awards for its innovative products.

For further information contact:



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