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CONFIGURAZIONE MIKROTIK - GUI

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CONNESSIONE ALL'APPARATO

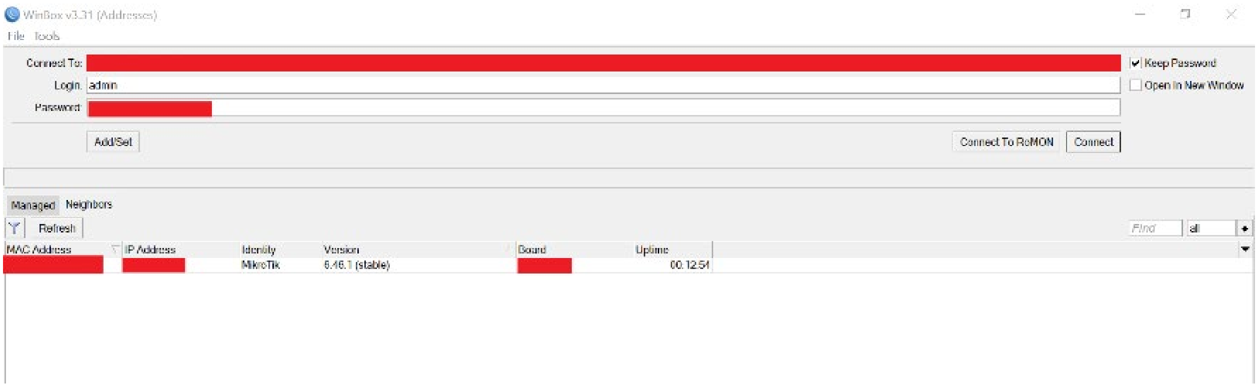
Effettuare il download di Winbox dal seguente link: https://mikrotik.com/download

Note: Verificare compatibilità con sistema operativo utilizzato. Se compatibile, procedere con gli step seguenti.

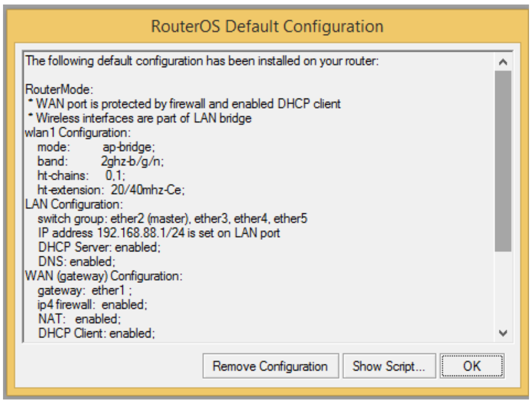
1. Collegare il router Mikrotik e il proprio PC tramite cavo RJ-45. Di default, tutte le porte del router sono attive.

2. Aprire Winbox sul device utilizzato per effettuare la configurazione e verificare che nella sezione neighbors venga rilevato il router Mikrotik

3. Effettuare il login con i parametri di default – Login: admin (no password)



4. Rimuovere la "default config" che si presenta al primo avvio come da esempio che segue e attendere il reboot. Al termine del riavvio, effettuare nuovamente il login seguendo i punti 2 e 3.



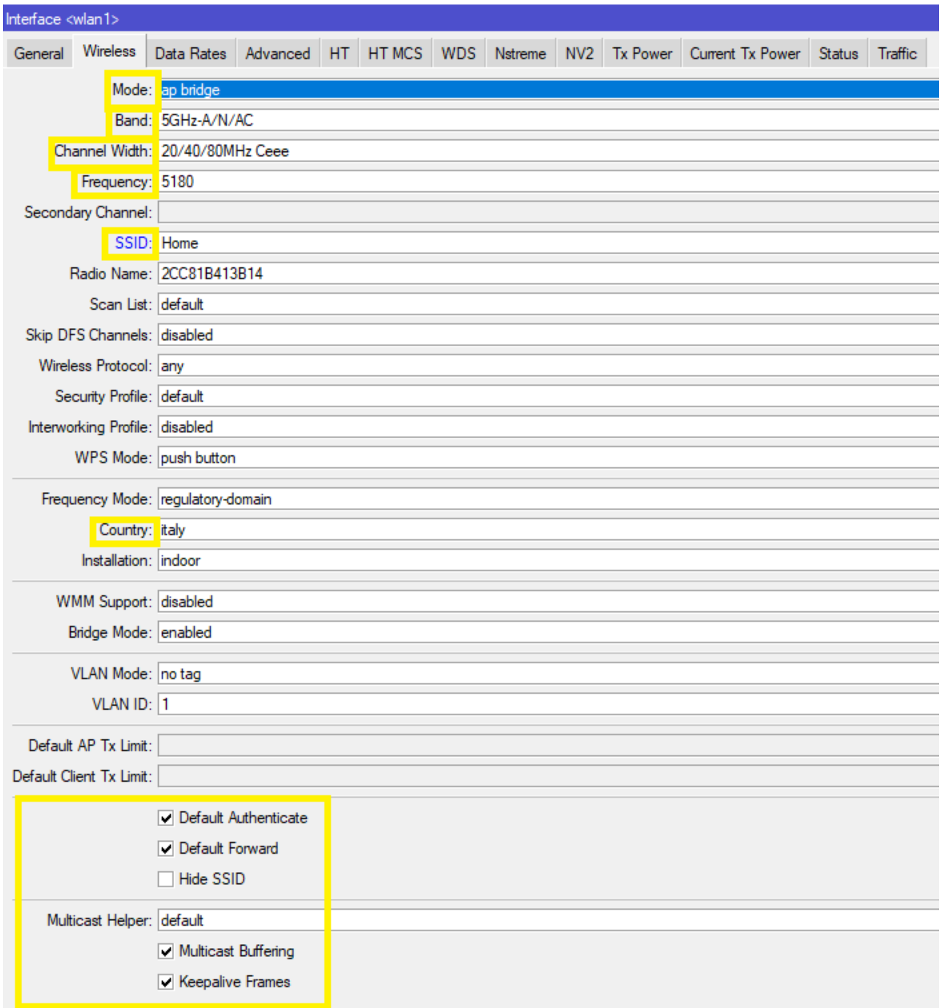
5. La schermata di winbox dovrà presentarsi come segue:

CONFIGURAZIONE INTERFACCE FISICHE/VIRTUALI E WIRELESS

6. Partendo dal punto 5:
   - Selezionare System → Packages → Selezionare ipv6 → Enable
   - Selezionare System → Reboot: Yes

7. Partendo dal punto 5:
   - Selezionare Interfaces → + → Bridge → Name : WAN → OK
   - Selezionare Interfaces → + → Bridge → Name : LAN → OK
   - Selezionare Interfaces → + → Bridge → Name : LAN-VOIP → OK
   - Selezionare Interfaces → + → VLAN → Name: WAN:836 → VLAN ID: 836 → Interface: WAN
   - Selezionare Interfaces → + → IPIPV6 Tunnel → Name: ipipv6-tunnel1 → Local Address: Dato disponibile in area personale → Remote Address: Dato disponibile in area personale → OK
   - Selezionare Interfaces → wlan1 o wlan2 → Wireless → Mode: AP bridge

   Note: Avendo la possibilità di modificare i parametri in base alle proprio esigenze, un esempio di configurazione potrebbe essere come segue:



8. Partendo dal punto 5:
   - Selezionare Wireless → doppio click su default → Mode: dynamic keys → Authentication Types: WPA PSK, WPA2 PSK → Unicast Ciphers: aes ccm,tkip → Group Ciphers: aes ccm,tkip

   Note: Nelle sezioni succcessive "WPA Pre-Shared Key" e "WPA2 Pre-Shared Key" configurare la password del WIFI associata all'SSID scelto nel punto 6

CONFIGURAZIONE BRIDGE

9. Partendo dal punto 5:
   - Selezionare Bridge → Ports → + → Interface: sfp-sfpplus1 → Bridge: WAN → OK
   - Selezionare Bridge → Ports → + → Interface: ether1 → Bridge: LAN → OK
   - Selezionare Bridge → Ports → + → Interface: ether2 → Bridge: LAN → OK
   - Selezionare Bridge → Ports → + → Interface: ether3 → Bridge: LAN → OK
   [...] fino alla porta ether9
   - Selezionare Bridge → Ports → + → Interface: wlan1 → Bridge: LAN → OK
   - Selezionare Bridge → Ports → + → Interface: wlan2 → Bridge: LAN → OK
   - Selezionare Bridge → Ports → + → Interface: ether10 → Bridge: LAN-VOIP → OK

CONFIGURAZIONE IPv4 ADDRESSING

10. Partendo dal punto 5:
   - Selezionare IP → Addresses → + → Address: Dato disponibile in area personale → Interface: ipipv6-tunnel1 →OK
   - Selezionare IP → Addresses → + → Address: 192.168.1.1/24 → Interface: LAN → OK
   Note: L'IP utilizzato è d'esempio, è possibile utilizzare qualsiasi altra classe IP privata riportata nella documentazione RFC 1597 e 1918
   - Selezionare IP → Addresses → + → Address: 192.168.2.1/24 → Interface: LAN-VOIP→ OK
   - Selezionare IP → Pool → + →Name: DHCP-LAN → Addresses: 192.168.1.2-192.168.1.254 → OK
   Note: Gli IP utilizzati sono d'esempio, è possibile utilizzare qualsiasi altra classe IP riportata nella documentazione RFC 1597 e 1918.
   - Selezionare IP → DHCP Server → + →Name: DHCP-LAN → Interface: LAN → Address Pool: DHCP-LAN → OK
   - Selezionare IP → DHCP Server → Networks → + → Address: 192.168.1.0/24 → Gateway: 192.168.1.1 → DNS Server: 8.8.8.8,8.8.4.4 → OK
   Note: Verificare che nella sezione Leases il dispositivo/dispositivi collegati abbiano ricevuto un IP dal DHCP server (in questo caso la Mikrotik)
   - Selezionare IP → Pool → + →Name: DHCP-VOIP-LAN→ Addresses: 192.168.2.2-192.168.2.254 → OK
   Note: Gli IP utilizzati sono d'esempio, è possibile utilizzare qualsiasi altra classe IP riportata nella documentazione RFC 1597 e 1918. In questa sezione è fondamentale configurare un range di IP disponibili.
   - Selezionare IP → DHCP Server → + →Name: DHCP-VOIP-LAN → Interface: LAN-VOIP → Address Pool: DHCP-VOIP-LAN → OK
   - Selezionare IP → DHCP Server → Networks → + → Address: 192.168.2.0/24 → Gateway: 192.168.2.1 → DNS Server: 8.8.8.8,8.8.4.4 → OK
   Note: Verificare che nella sezione Leases il dispositivo/dispositivi collegati abbiano ricevuto un IP dal DHCP server (in questo caso la Mikrotik)
   - Selezionare IP → Firewall → NAT → + → Chain: srcnat → Src. Address: 192.168.1.0/24 → Action → Action: masquerade → OK
   - Selezionare IP → Routes → + → Dst. Address: 0.0.0.0/0 → Gateway: ipipv6-tunnel1 → OK

CONFIGURAZIONE IPv6 ADDRESSING

11. Partendo dal punto 5:
   - Selezionare IPv6 → Addresses → + → Addresses: Dato disponibile in area personale → Interface: ipipv6-tunnel1 → OK
   - Selezionare IPv6 → DHCP Client → + → DHCP → Interface: WAN:836 → Request: Selezionare address,prefix → Pool Name: ipv6-pool → Selezionare "Use Peer DNS, Rapid Commit, Add default Route → OK → Click sulla voce "Release"
   - Selezionare IPv6 → Addresses → + → Addresses: ::192:168:1:1/64 → From Pool: : ipv6-pool → Interface: LAN → Selezionare Advertise → OK
   - Selezionare IPv6 → Addresses → + → Addresses: ::192:168:2:1/64 → From Pool: : ipv6-pool → Interface: LAN-VOIP → Selezionare Advertise → OK
   - Selezionare IPv6 → Routes → + → Dst. Address: Dato disponibile in area personale → Gateway:WAN → OK

PERSONALIZZARE CREDENZIALI DI ACCESSO ALL'APPARATO

Come best practices una volta effettuate le configurazioni, si consiglia dalla schermata di winbox (punto 5):

- New Terminal → copiare e incollare

```
/user add name=myname password=mypassword group=full
/user remove admin
```

Note: "Myname" e "mypassword" sono valori di default che devono essere cambiati con le credenziali che si vogliono utilizzare per collegarsi all'apparato.

- New Terminal → copiare e incollare

```
/ip service
set telnet disabled=yes
set ftp disabled=yes
set www disabled=yes
set api disabled=yes
set api-ssl disabled=yes
```

Per maggiori dettagli

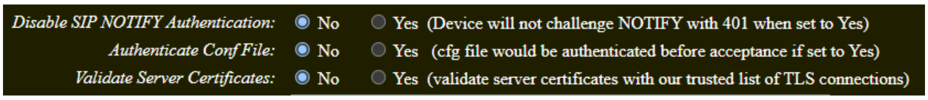
- https://wiki.mikrotik.com/wiki/Manual:Securing_Your_Router
- https://wiki.mikrotik.com/wiki/Main_Page

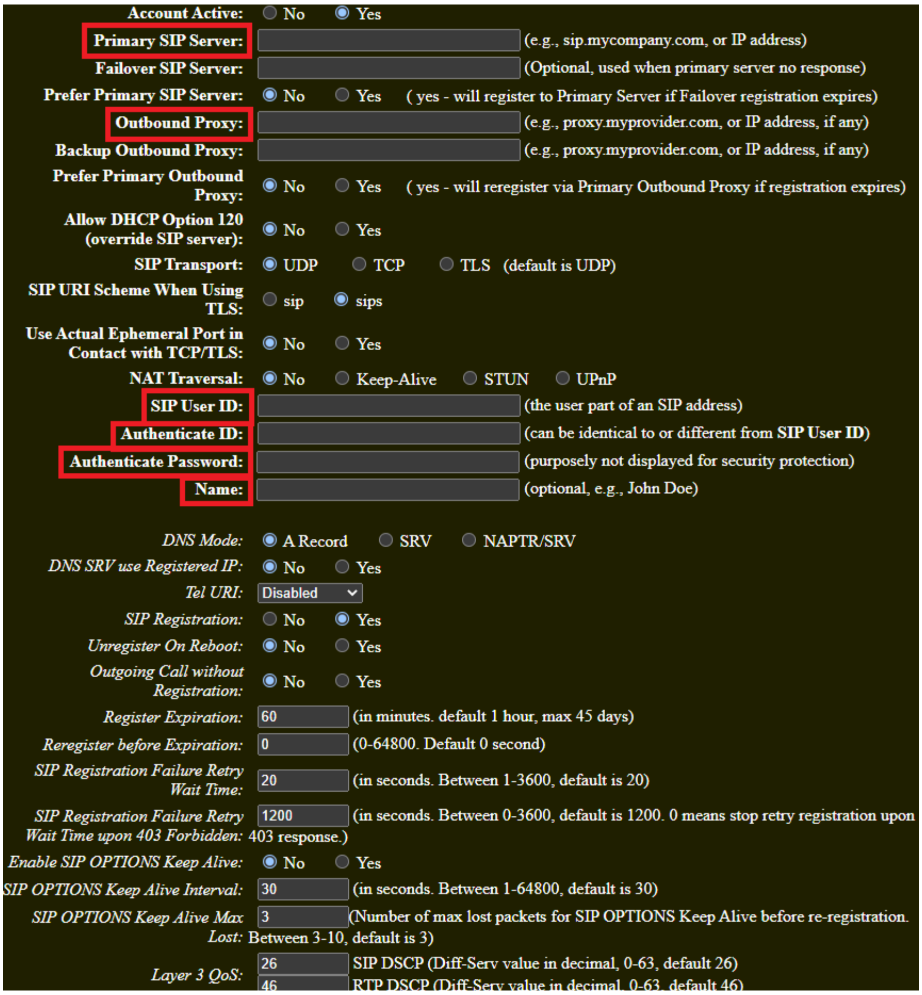
CONFIGURAZIONE VOIP – ESEMPIO CON GRANDSTREAM H813

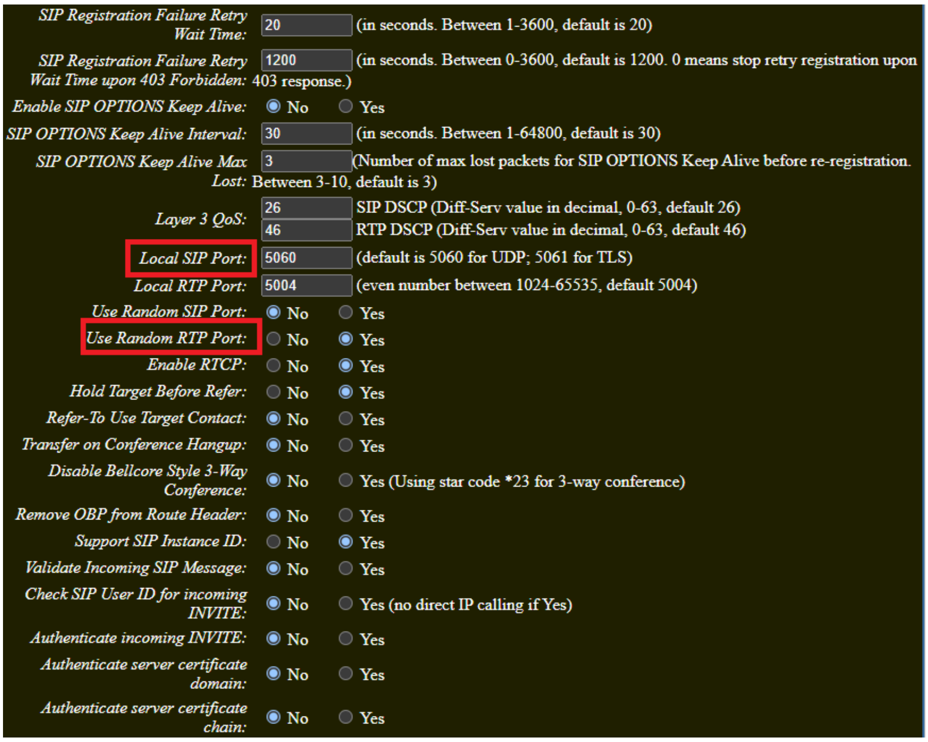
Di seguito i dati necessari per la configurazione del dispositivo e le relative schermate.

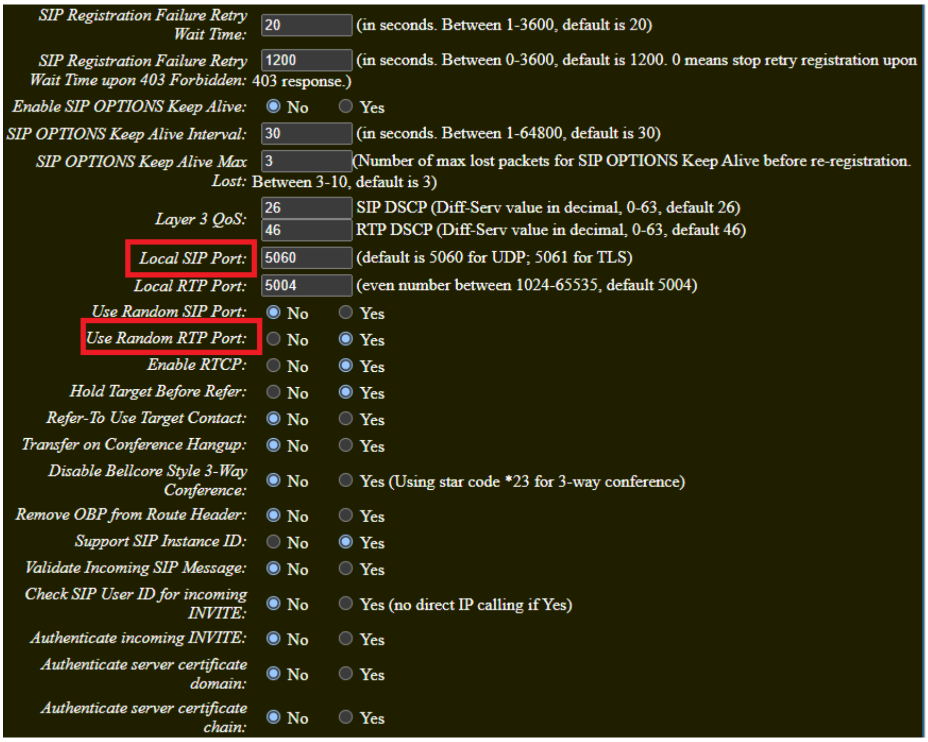
- **SIP USERNAME:** Dato disponibile in area personale
- **SIP PASSWORD:** Dato disponibile in area personale
- **SIP DOMAIN:** voip.iliad.it
- **SIP OUTBOUND PROXY:** Dato disponibile in area personale
- **SIP PORT:** 5060
- **SIP PROTOCOL:** UDP

https://www.grandstream.com/hubfs/Product_Documentation/HT813_User_Guide.pdf






SIP Registration Failure Retry Wait Time: 20 (in seconds. Between 1-3600, default is 20)
SIP Registration Failure Retry Wait Time upon 403 Forbidden: 1200 (in seconds. Between 0-3600, default is 1200. 0 means stop retry registration upon 403 response.)
Enable SIP OPTIONS Keep Alive: No Yes
SIP OPTIONS Keep Alive Interval: 30 (in seconds. Between 1-64800, default is 30)
SIP OPTIONS Keep Alive Max Lost: 3 (Number of max lost packets for SIP OPTIONS Keep Alive before re-registration. Between 3-10, default is 3)
Layer 3 QoS: 26 SIP DSCP (Diff-Serv value in decimal, 0-63, default 26)
46 RTP DSCP (Diff-Serv value in decimal, 0-63, default 46)
Local SIP Port: 5060 (default is 5060 for UDP; 5061 for TLS)
Local RTP Port: 5004 (even number between 1024-65535, default 5004)
Use Random SIP Port: No Yes
Use Random RTP Port: No Yes
Enable RTCP: No Yes
Hold Target Before Refer: No Yes
Refer-To Use Target Contact: No Yes
Transfer on Conference Hangup: No Yes
Disable Bellcore Style 3-Way Conference: No Yes (Using star code *23 for 3-way conference)
Remove OBP from Route Header: No Yes
Support SIP Instance ID: No Yes
Validate Incoming SIP Message: No Yes
Check SIP User ID for incoming INVITE: No Yes (no direct IP calling if Yes)
Authenticate incoming INVITE: No Yes
Authenticate server certificate domain: No Yes
Authenticate server certificate chain: No Yes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Use Random RTP Port: No Yes
Enable RTCP: No Yes
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Refer-To Use Target Contact: No Yes
Transfer on Conference Hangup: No Yes
Disable Bellcore Style 3-Way Conference: No Yes (Using star code *23 for 3-way conference)
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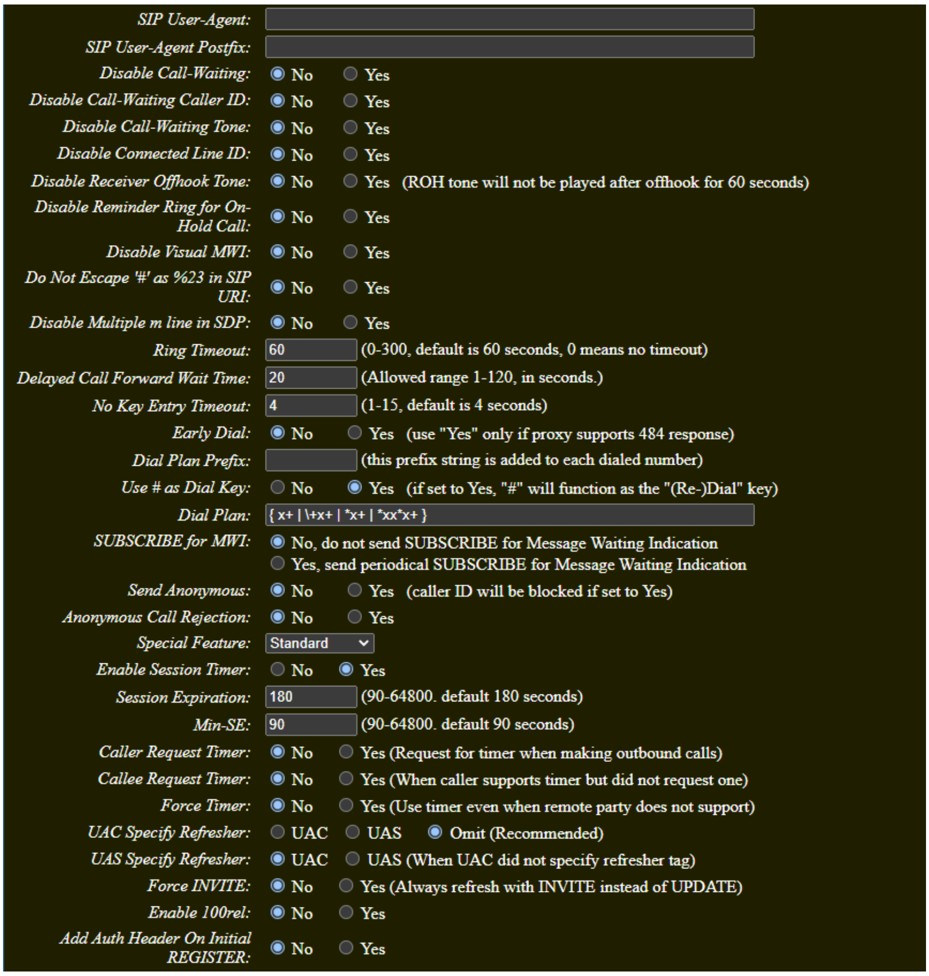
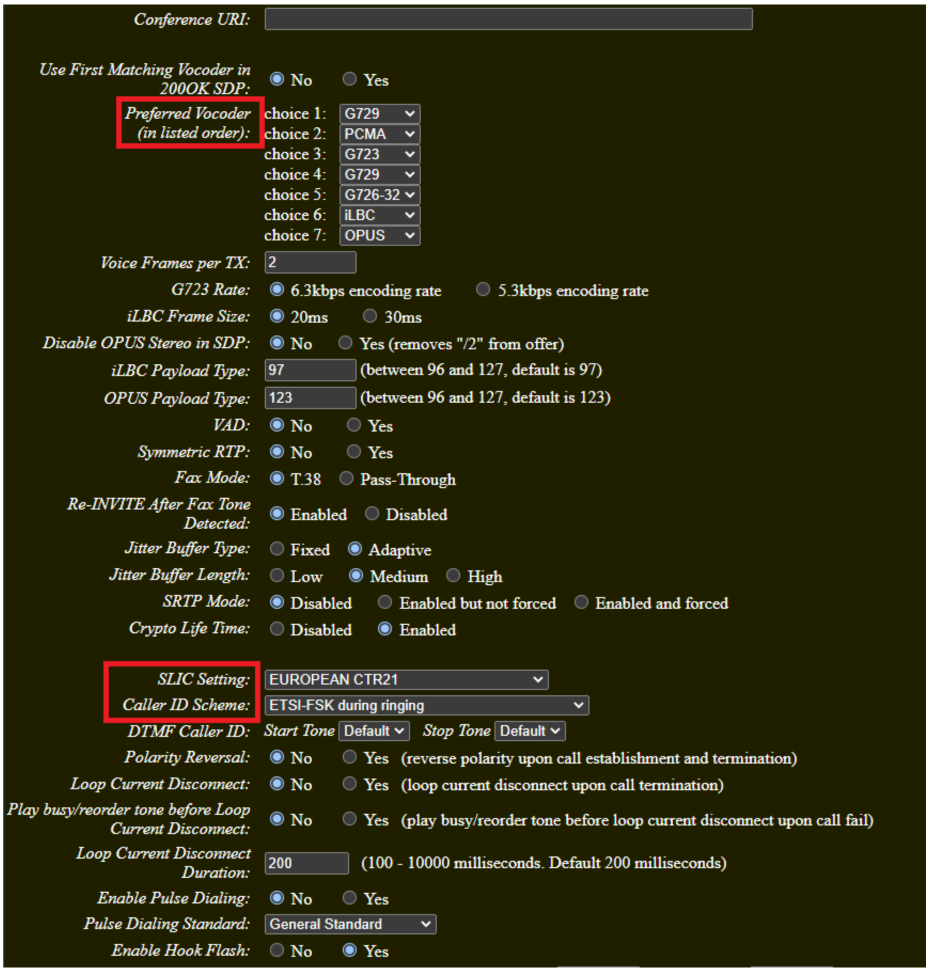
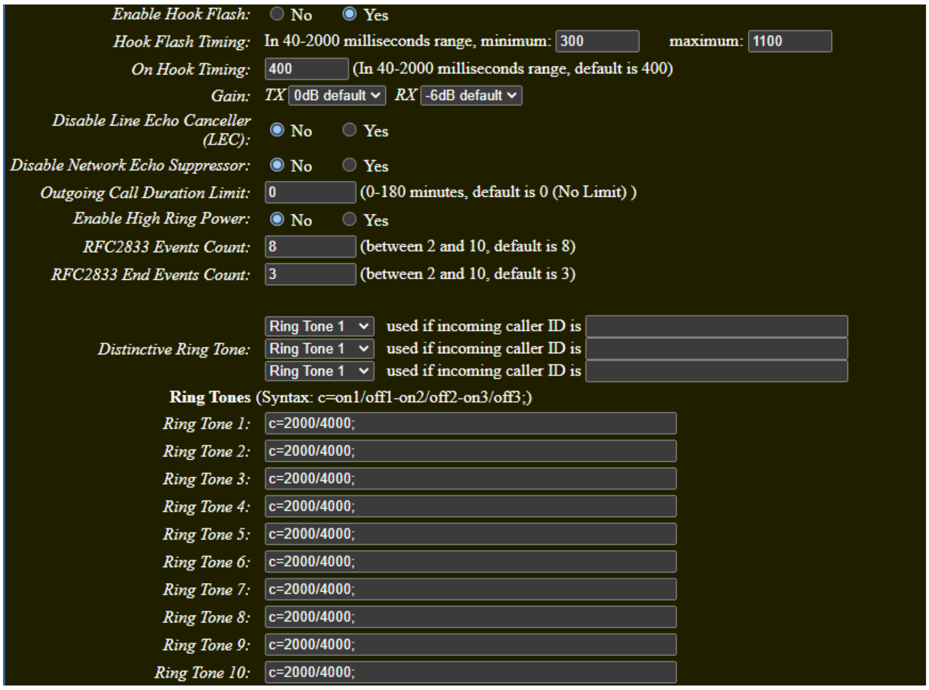

SIP User-Agent:
SIP User-Agent Postfix:
Disable Call-Waiting: No Yes
Disable Call-Waiting Caller ID: No Yes
Disable Call-Waiting Tone: No Yes
Disable Connected Line ID: No Yes
Disable Receiver Offhook Tone: No Yes (ROH tone will not be played after offhook for 60 seconds)
Disable Reminder Ring for On-Hold Call: No Yes
Disable Visual MWI: No Yes
Do Not Escape '#' as %23 in SIP URI: No Yes
Disable Multiple m line in SDP: No Yes
Ring Timeout: 60 (0-300, default is 60 seconds, 0 means no timeout)
Delayed Call Forward Wait Time: 20 (Allowed range 1-120, in seconds.)
No Key Entry Timeout: 4 (1-15, default is 4 seconds)
Early Dial: No Yes (use "Yes" only if proxy supports 484 response)
Dial Plan Prefix: (this prefix string is added to each dialed number)
Use # as Dial Key: No Yes (if set to Yes, "#" will function as the "(Re-)Dial" key)
Dial Plan: { x+ | \+x+ | *x+ | *xx*x+ }
SUBSCRIBE for MWI: No, do not send SUBSCRIBE for Message Waiting Indication
Yes, send periodical SUBSCRIBE for Message Waiting Indication
Send Anonymous: No Yes (caller ID will be blocked if set to Yes)
Anonymous Call Rejection: No Yes
Special Feature: Standard
Enable Session Timer: No Yes
Session Expiration: 180 (90-64800. default 180 seconds)
Min-SE: 90 (90-64800. default 90 seconds)
Caller Request Timer: No Yes (Request for timer when making outbound calls)
Callee Request Timer: No Yes (When caller supports timer but did not request one)
Force Timer: No Yes (Use timer even when remote party does not support)
UAC Specify Refresher: UAC UAS Omit (Recommended)
UAS Specify Refresher: UAC UAS (When UAC did not specify refresher tag)
Force INVITE: No Yes (Always refresh with INVITE instead of UPDATE)
Enable 100rel: No Yes
Add Auth Header On Initial REGISTER: No Yes


Conference URI:
Use First Matching Vocoder in 200OK SDP: No Yes
Preferred Vocoder (in listed order):
choice 1: G729
choice 2: PCMA
choice 3: G723
choice 4: G729
choice 5: G726-32
choice 6: iLBC
choice 7: OPUS
Voice Frames per TX: 2
G723 Rate: 6.3kbps encoding rate 5.3kbps encoding rate
iLBC Frame Size: 20ms 30ms
Disable OPUS Stereo in SDP: No Yes (removes "/2" from offer)
iLBC Payload Type: 97 (between 96 and 127, default is 97)
OPUS Payload Type: 123 (between 96 and 127, default is 123)
VAD: No Yes
Symmetric RTP: No Yes
Fax Mode: T.38 Pass-Through
Re-INVITE After Fax Tone Detected: Enabled Disabled
Jitter Buffer Type: Fixed Adaptive
Jitter Buffer Length: Low Medium High
SRTP Mode: Disabled Enabled but not forced Enabled and forced
Crypto Life Time: Disabled Enabled
SLIC Setting: EUROPEAN CTR21
Caller ID Scheme: ETSI-FSK during ringing
DTMF Caller ID: Start Tone Default Stop Tone Default
Polarity Reversal: No Yes (reverse polarity upon call establishment and termination)
Loop Current Disconnect: No Yes (loop current disconnect upon call termination)
Play busy/reorder tone before Loop Current Disconnect: No Yes (play busy/reorder tone before loop current disconnect upon call fail)
Loop Current Disconnect Duration: 200 (100 - 10000 milliseconds. Default 200 milliseconds)
Enable Pulse Dialing: No Yes
Pulse Dialing Standard: General Standard
Enable Hook Flash: No Yes


Enable Hook Flash: No Yes
Hook Flash Timing: In 40-2000 milliseconds range, minimum: 300 maximum: 1100
On Hook Timing: 400 (In 40-2000 milliseconds range, default is 400)
Gain: TX 0dB default RX -6dB default
Disable Line Echo Canceller (LEC): No Yes
Disable Network Echo Suppressor: No Yes
Outgoing Call Duration Limit: 0 (0-180 minutes, default is 0 (No Limit))
Enable High Ring Power: No Yes
RFC2833 Events Count: 8 (between 2 and 10, default is 8)
RFC2833 End Events Count: 3 (between 2 and 10, default is 3)
Distinctive Ring Tone:
Ring Tone 1 used if incoming caller ID is
Ring Tone 1 used if incoming caller ID is
Ring Tone 1 used if incoming caller ID is
Ring Tones (Syntax: c=on1/off1-on2/off2-on3/off3;)
Ring Tone 1: c=2000/4000;
Ring Tone 2: c=2000/4000;
Ring Tone 3: c=2000/4000;
Ring Tone 4: c=2000/4000;
Ring Tone 5: c=2000/4000;
Ring Tone 6: c=2000/4000;
Ring Tone 7: c=2000/4000;
Ring Tone 8: c=2000/4000;
Ring Tone 9: c=2000/4000;
Ring Tone 10: c=2000/4000;

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