



# Mediatix® Sentinel 400 and RS

The Sentinel 400 and Sentinel RS bundle the capabilities of a Session Border Controller, Virtualization server and Media Gateway, featuring E1/T1 PRI, ISDN BRI, FXS, and FXO interfaces. Robust, field-upgradable, and ready for third-party software integration, this multi-service business platform is designed for medium and large enterprises. Sentinel 400 is ideally targeting applications for up to 2000 users, while the RS supports up to 6000 users.

The Sentinel 400 and RS deliver a flexible architecture designed to address a variety of applications including security, demarcation point, SIP normalisation, and survivability.

The Sentinel series is Microsoft Teams certified for Direct Routing and takes full advantage of the current security features, such as a firewall with DDoS prevention and signaling, media and data encryption capabilities.



## Survivability

Sentinel ensures service continuity by establishing external calls through the PSTN or the secondary trunk and by routing internal calls when the primary network is temporarily unavailable.

## SIP Normalisation

Sentinel normalises major vendor SIP signaling protocols into a single well-defined interface that can be adapted to any specific IMS or Softswitch implementation.

## Network Demarcation

Create a clear separation between the enterprise and the operator networks by hiding the topologies and credentials, and by blocking unauthorised users.

## Integration with Third-Party Applications

Sentinel provides an open environment for system integrators to bundle their own applications into a business-class multi-service platform, increasing CPE investment profitability while addressing customer needs.

## Mass Management

Featuring advanced provisioning capabilities for a smooth integration into mass management systems, ensuring service and reducing operational costs.

## Remote Users

Sentinel solves far-end NAT traversal problems and supports SIP manipulations, providing communication service access to branch offices, home workers, or travellers as if they were on the same site.

## Applications

### Operators

- ✓ Provide a demarcation point with QoS and remote troubleshooting for a cost-effective network management and customer service.
- ✓ Provide service continuity in Hosted Unified Communications/PBX deployments with phone survivability, failover to geo-redundant core servers, and QoS traffic shaping.
- ✓ Secure communications inside or outside on both the operator and customer networks
- ✓ Facilitate TDM replacement projects, fully migrating to SIP or integrating the current legacy equipment

### System Integrators

- ✓ Safely connect branch offices and mobile workers to the enterprise PBX or UC system
- ✓ Integrate 3rd-party applications in a single box for niche markets
- ✓ Perform SIP normalisation translating any vendor implementation into a single well-defined SIP interface
- ✓ Protect the IP network of the Enterprise by controlling all incoming and outgoing media, signaling and data
- ✓ Create a shield of confidentiality between the enterprise and the public network

## Key Features

### Carrier-Grade Features

T.38 and clear channel fax over IP  
High performance processing of up to 240 voice channels

### Robust Security

Enterprise communication encryption  
SIP-enabled firewall inspects and authorises communications and prevents DoS attacks

### Networking

Dual-stack IPv6 and IPv4  
Multiple IP addresses and VLANs  
NAT, firewall, and router capabilities

### Easy Configuration and Management

Intuitive Web GUI  
Customisable factory settings

### Field Upgradability

Scalable and modular design allows adding interface cards as enterprise needs to evolve  
Third-party application integration  
Open environment allows easy integration of third-party software

## Benefits

- ✓ High quality built and carrier-grade validation standards contribute to the industry's most reliable platform
- ✓ Microsoft Teams Certified for Direct Routing
- ✓ Superior rule-based SBC with dynamic routing and manipulations for solving complex deployment scenarios

# Technical Specifications

## Session Border Controller

Back-to-Back user agent  
SIP header manipulation  
SIP registrar  
SIP authentication  
SIP failover  
Registration throttling/caching  
Call forking  
Advanced, rule-based, call routing  
Dynamic call routing based on:  
• Peer monitoring state  
• Registration cache  
Call Admission Control (CAC), per trunk, based on:  
• Call volume  
• Bandwidth usage  
• Concurrent calls  
Near and far-end NAT traversal  
SIP and media encryption  
UDP/TCP/TLS interworking  
Topology Hiding

## Concurrent calls and registrations

Feature	400	RS
Concurrent calls	400	2000
Registered users	2000	6000

*A licence is needed for each concurrent call*

*No extra licence required per user*

## SIP Mediation

Request-URI modifications  
Modify From / To / User / Host  
Substitution expressions  
Add, remove, whitelist and blacklist headers  
Transfer methods: pass-thru, reject or internal  
INVITE with Replaces handling  
Transparent Dialog IDs  
Translate reply code  
Via-HFs and Contact-HF handling

## Media control (SBC)

Audio and video media relay  
Media encryption, SRTP and RTP interworking  
Early media (drop SDP from 1xx)  
DTMF interworking (RFC4733/RFC2833, SIP INFO)  
Codec enforcement and re-prioritization  
Codec whitelist and blacklist  
Voice codecs: G.711, G.722, G.722.2, G.723, G.726, G.729, AMR, GSM, iLBC, OPUS, SILK and others\*  
Video codecs: H.261, H.263, H.264, VP\* and others\*  
\* Supported codecs are dependent on the IP-PBX and VoIP endpoints technical specifications

## Enhanced Security

Signaling and media topology hiding  
Denial of Service (DoS) protection of core and enterprise networks  
Call rate limitation  
SIP over TLS  
SRTP with AES cipher – 128 bits

SDS key management protocol (RFC 4568)  
TLS-encrypted configuration and management  
X.509 certificate management  
OCSP revocation status verification  
TLS Version 1.2 and 1.3  
Secure TLS ciphers such as AES-256-GCM, SHA384 with RSA 4096-bit and ECDSA-384 signatures.

## Quality of Service (QoS)

Bandwidth limitation and traffic shaping  
TOS/DiffServ  
IEEE 802.1p/Q

## Networking

Multiple IP addresses per link or VLAN  
Multiple VLANs per link  
DHCP client / DHCP Server  
PPPoE (RFC 2516)  
IEEE 802.1q + DSCP QoS tagging (media, signaling, and mgmt)  
IEEE 802.1x wired authentication  
LLDP-med (ANSI/TIA-1057)  
QoS traffic shaping  
Firewall with stateful inspection, rate-limitation, and automatic black-listing  
IP forwarding, SNAT / DNAT  
Static routing and advanced IP Routing  
NAPT  
VRRP  
Ethernet failover on Eth4-Eth5

## Management (SBC)

Web GUI, SSH and TELNET  
SNMP v1, v2c, and v3  
Scripts/firmware files uploaded via HTTP, HTTPS, FTP, and TFTP  
Multiple levels of management access rights  
Event notifications via Syslog, SIP, log file, and SNMP traps  
Remote activation of service licenses  
Radius Authentication

## Monitoring and Troubleshooting

Alarms and traps  
Event Log  
Subscriber's active registration and call monitoring  
System: CPU and memory usage  
IP network capture  
Diagnostic traces

## IP Telephony Protocol

SIP (RFC 3261) over UDP, TCP, and TLS  
IMS (3GPP TS 24.229)  
RTP (RFC 3550)  
SDP (RFC 4566)  
Multi-part body support  
Redundancy support via DNS SRV  
Multiple trunk support  
Survivability for IP-Phones

# Telephony Specifications

## Telephony Ports

1 to 8 x RJ-48 E1/T1 connectors\*  
4, 8, 12, 16, 20, 24, or 28 x RJ-48 BRI S/T connectors\*  
4, 8, 12, 16, 20, 24, or 28 x RJ-11 FXS connectors\*  
4, 8, 12, 16, 20, 24, or 28 x RJ-11 FXO connectors\*  
(\*Depending on configuration)

## Digital Telephony

Euro ISDN EDSS-1/ETSI PRI/NET5 BRI/NET3  
ISDN NI-2, DMS 100 and 5ESS (US T1 PRI)  
Supports NT, TE, port pinout switching, autosensing  
Line coding: B8ZS, HDB3, AMI  
Line Framing: SF(D4), ESF, CRC4, NoCRC4  
Configurable channel range and allocation strategy  
Inband tone and DTMF generation  
ISDN speech, audio, and data (Fax Gr 4, UDI 64, and RDI 64)  
Configurable progress indicators  
Caller ID with DMS100, ROSE or Facility Services  
Configurable CLIP, CLIR, COLP, COLR  
Overlap dialing  
ECMA-143 (QSIG-BC)  
CFU, CFNR, CFB Call Diversion and Rerouting (ETS 300 207)  
Advice of Charge AOC-D and AOC-E (ETS 300 182)  
Malicious Call Identification (MCID) (ETS 300 128 and EN 300 130-1)  
T1/E1 E&M (Immediate, Wink-Start, Feature Group-B, and Feature Group-D), MF-R1, DTMF  
E1 R2 digital line signaling (ITU-T Q.421)  
E1 R2 MFC inter-register signaling (ITU-T Q.441)  
Presets for: Brazil, Argentina, Mexico, Saudi Arabia, Venezuela, Philipines, and ITU-T

## Analog Telephony

Support for call forward, call transfer, conference call, call waiting, CCNR, and CCBS  
Two line (Centrex) or single line (IP Phone) behavior  
Multiple country presets  
Customisable tones and ring patterns  
Distinctive ring (Bellcore-dr)  
Configurable DTMF maps and timeouts  
Echo cancellation  
Configurable Loop current (20-32 mA)  
Configurable Flash Hook Detection timing and actions  
Message Waiting Indication (MWI), via FSK and voltage (80v)  
Caller ID detection (name & number) as per Bell-core FSK  
On-hook/off-hook caller ID generation (name & number) as per Bell-core DTMF or FSK and Telebras BINA  
Answer and disconnect signaling  
Configurable Digital Hybrid filter  
Configurable line supervision mode

## Fax and Modem Support

Group 3/super G3 fax real-time fax over IP  
T.38 fax relay (9.6 k and 14.4 k)  
Clear channel (G.711) fax and modem pass-through

## International standards support

Certified for North America, Europe, Brazil, Mexico, Eurasian Customs Union, Australia and New Zealand.  
Supports over 27 country specifications  
Brazil, Denmark and Saudi Arabia DTMF Caller ID  
Supports fixed (600 ohm) and complex impedances  
Configurable Dial tone detection and answering delay assuring compatibility with most Paging and emergency devices.

## Long loop and secondary lightning protection

2 km loop length  
Secondary lightning protection with PTC and Thyristor  
60 Vrms ring voltage  
*\* Features available on the LP 4-FXS card*

## Media Processing (Gateway)

G.711 (A-law and  $\mu$ -law), G.722, G.726, and G.729a/b;  
G.168 echo cancellation  
Configurable packetization time  
DTMF detection and generation  
Carrier tone detection and generation  
Silence detection/suppression and comfort noise  
Configurable de-jitter buffer and packet length  
Packet loss concealment  
Customizable input and output gain  
Music on hold

## Advanced SIP Features

Dual stack IPv4/IPv6 for signaling and media  
Alternative Network Address Types (ANAT) (RFC4091)  
PRACK (RFC 3262)  
Security Mechanism Agreement (Mediasec) (RFC 3329)  
Key Press Stimulus (KPML) (RFC 4730)  
Call quality reporting (eMOS) (RTCP-XR as per RFC 6035)  
Diversion Indication (RFC 5806)  
Q.850 Codes in Reason Header Fields (RFC 6432)  
ISDN ISUP to SIP mapping (RFC 3398)  
SIP INFO (choudhuri)  
Advice of Charge (AOC)

## Call Routing

Local switching  
Call filtering and blocking  
Calling/called number manipulation using regular expressions  
Routing criteria:

- Interface
- Calling/called party number
- Calling/called URI
- Time of day, day of week, and date
- Many others

Mapping and transformation of call properties to/from SIP headers  
Hunt groups

## Telephony interfaces management

Zero-touch provisioning  
TR-069, TR-104, and TR-111  
Customisable Call Details Record (CDR)  
Media quality statistics  
PCM capture

### Virtual Machine Support

Sentinel 400: up to 3 VMs, Sentinel RS: up to 7 VMs.  
Intel VT and AMD-V acceleration  
Virtio network with access to WAN and LAN interfaces  
Support for USB inside VMs.

### System specifications

Feature	400	RS
CPU	Intel Celeron N2930 1.83/2.16 Ghz	AMD Ryzen V1605B 2.0/3.6 Ghz
RAM	2, 4 or 8 GB DDR3	16 GB DDR4
SSD	16/64/128 GB mSATA	128 GB M.2 SATA

(Other configurations available on request)



### Physical Interfaces

5 x 10/100/1000 BaseT Ethernet RJ-45 connectors  
2 x TDM sync RJ-45 connectors  
2 x USB 2.0 Type-A connectors (2 x USB 3.1 on RS)  
8 Telephony slots

### Power Supply

Single or dual internal 100-240 VAC power supply  
Optional 48 VDC PSU available

### Operating Environment

Operating temperature: 0°C to 40°C  
Storage temperature: -20°C to 70°C  
Humidity: up to 85%, non-condensing

### Dimensions

Standard 1U Rackmount (front mount)  
Height: 4.4 cm  
Width (mounting brackets): 48.5 cm  
Depth: 33 cm  
Weight: 7Kg approx.

### Ordering

Customers can order individual modules or a combination of them assembled from factory into a Sentinel base unit.  
SBC licences can be later uploaded for service activation. Sentinel also offers optional redundant power supply and 48 VDC unit.

Module	Description
Base Unit	1 WAN + 4 LAN 10/100/1000 Ethernet 8 slots for telephony cards
Telephony Cards	1 x PRI port card 4 x BRI port card 4 x FXS port card 4 x FXO port card DSP card (when using FXS/FXO/BRI)
Mounting	19 inch Rack (1U), ears and screws included

*This datasheet applies to model: S.*



## A Trusted Partner

M5 Technologies is a global supplier of multimedia communication solutions, offering a complete set of IP-based products and technologies.

With a focus on innovation and excellence in customer support, we deliver highly adaptive hardware and ready-to-market software components. This allows our customers and partners to take advantage of secure, reliable, and comprehensive communication solutions.

Present in more than one hundred countries, Media5 has its headquarters in Canada and local representatives in North and Latin America, Europe, and the Middle East.

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