

ThinkTel

digium[®]

THINKTEL COMMUNICATIONS

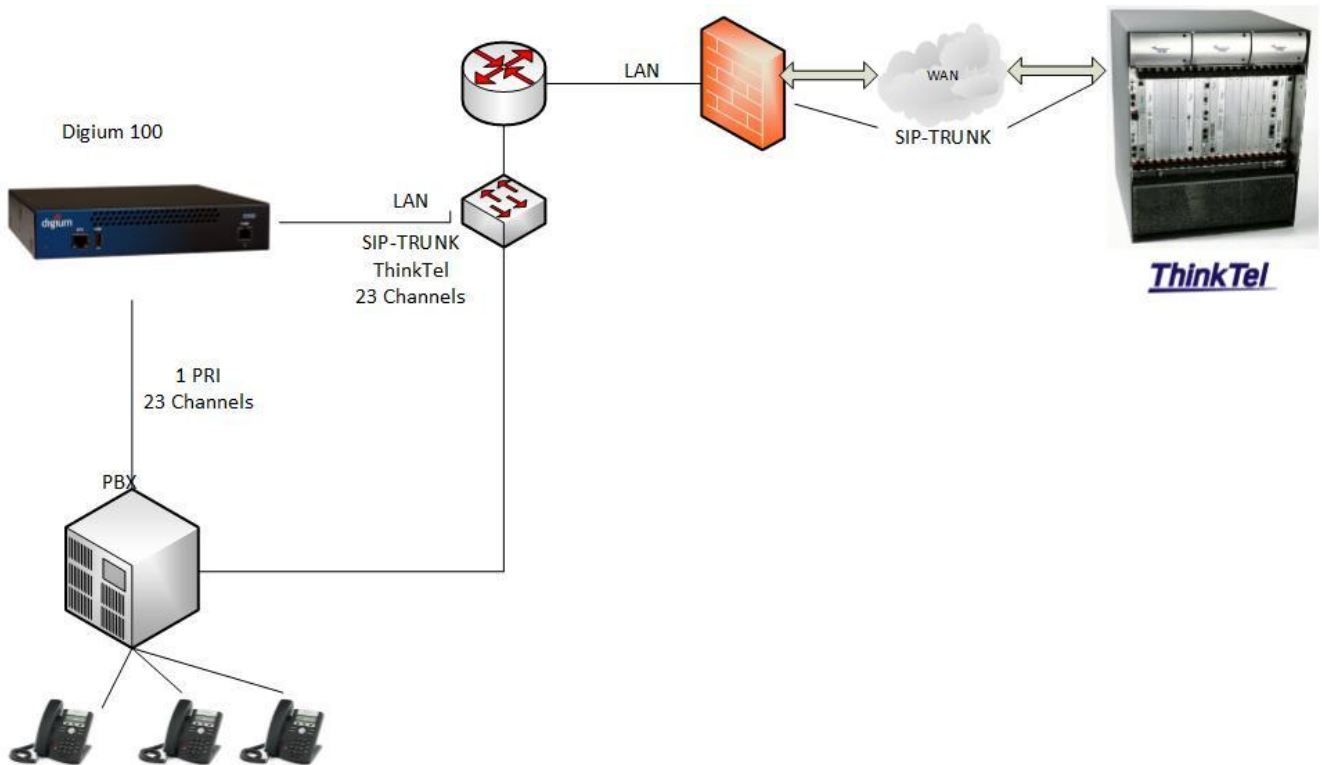
DIGIUM G100/G200

PRI OVER IP - SIP TRUNKING

TABLE OF CONTENTS

1.1	NETWORK DIAGRAM.....	3
1.2	COLLABORATION OF MONARQUE TELECOM.....	3
1.3	CONNECTING TO THE DIGIUM G100.....	4
1.4	IP CONFIGURATION	5
1.5	SIP-TRUNK CONFIGURATION	5
1.6	CALL SETTINGS	7
1.7	MEDIA SETTINGS	8
1.8	GLOBAL SIP SETTINGS	8
1.9	T1/E1 CONFIGURATION.....	10
1.10	CALL ROUTING RULES	12
1.11	CONNECTION STATUS	14
1.12	OUTGOING AND INCOMING CALLS	15
1.13	BACK UP THE CONFIGURATION	15
1.14	FIREWALL CONFIGURATION	16

1.1 NETWORK DIAGRAM



-For this case we are going to use only one PRI interface on a G100, 23 concurrent calls

1.2 COLLABORATION OF MONARQUE TELECOM



- All these tests were carried out and implemented in collaboration with MONARQUE TELECOM Elite Digium Switchvox IP-Systems and DIGIUM G100/G200 distributor, a company specializing in business VoIP and hosted IP telephony
- <http://www.monarque.ca>

1.3 CONNECTING TO THE DIGIUM G100

- First the DIGIUM G100 must be connected to the mains with the power cable.
- It is recommended to connect the DIGIUM G100/G200 Via Statically assigned IP address, Connect one end of an Ethernet cable to the G100 Ethernet port, and the other end to an Ethernet connection on a computer. That computer will need to use the network configuration listed below

IP: 192.168.69.2

Netmask: 255.255.255.0

Obtain an IP address automatically

Use the following IP address:

IP address:	192 . 168 . 69 . 2
Subnet mask:	255 . 255 . 255 . 0
Default gateway:	. . .

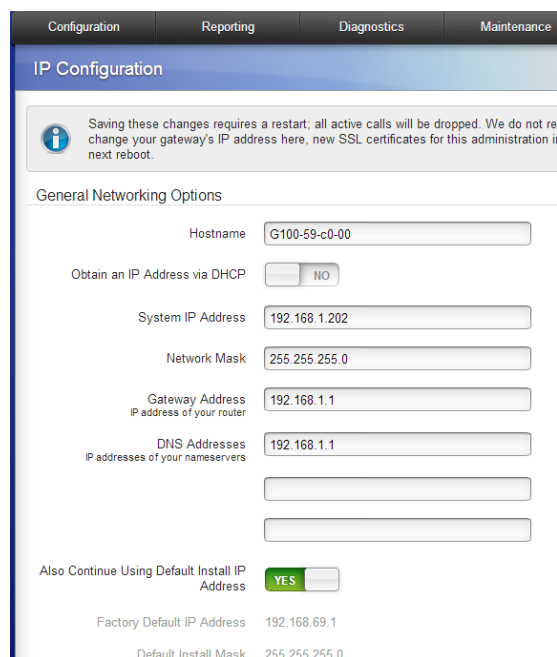
- Open a browser window and enter the default IP address for the Gateway using HTTPS
<https://192.168.69.1>
username: admin
password: admin



- It is highly recommended that the “admin” password be changed using the “System Administrators” menu on the web GUI

1.4 IP CONFIGURATION

- Click on “Configuration” >> “ IP Configuration”
- Don’t enable the parameter “Obtain an IP address via DHCP”
- Specify the static IP address for the G100 by entering a valid local IP to “System IP Address”
- Enter the Network Mask
- Enter the Gateway IP Address
- Enter the DNS IP Address
- Leave “ Also Continue Using Default IP Address” to “YES”

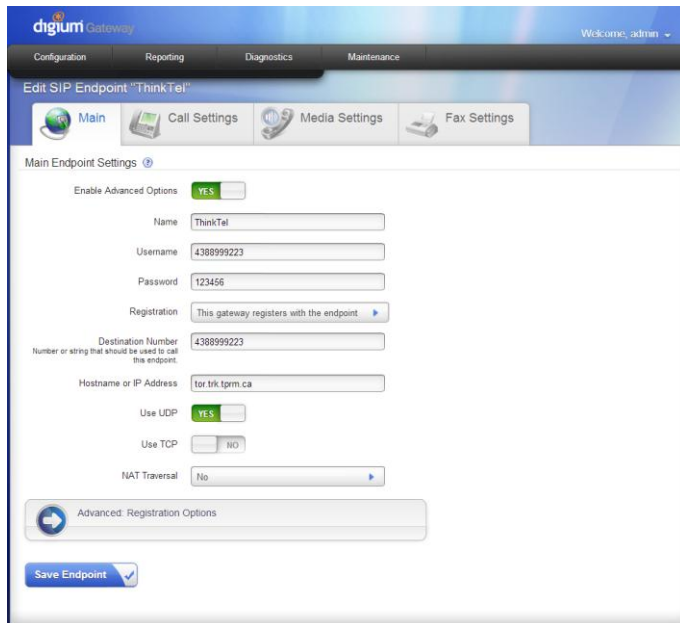


- Note : When you enter the Static IP Address the Gateway will immediately be unresponsive from its old IP address. It may take up to 15 seconds for the new IP address to be assigned and functional. The new IP address of the Gateway (For our case 192.168.1.202) must be entered into the Browser and use the following link <https://192.168.1.202>

1.5 SIP-TRUNK CONFIGURATION

- Click on “Configuration” >> “SIP Endpoints”
- Click on “Create SIP Endpoint”
- On the Tab “MAIN” set “Enable Advanced Options” to “YES”
- On “Name” enter “ThinkTel”
- On “Username” enter the pilot number provided by ThinkTel
- On “Password” enter the password provided by ThinkTel
- On “Registration” choose “This gateway registers with the endpoint”

- On “ Destination Number” enter the same number as the pilot number provided by ThinkTel
- On “Hostname or IP Address” enter the FDQN or the IP Address of the SIP Proxy server provided by ThinkTel
- On “Use UDP” choose “YES”
- On “Use TCP” choose “NO”



digium Gateway

Welcome, admin

Configuration Reporting Diagnostics Maintenance

Edit SIP Endpoint "ThinkTel"

Main Call Settings Media Settings Fax Settings

Main Endpoint Settings

Enable Advanced Options YES

Name ThinkTel

Username 4388999223

Password 123456

Registration This gateway registers with the endpoint

Destination Number 4388999223

Hostname or IP Address tor.trk.tprm.ca

Use UDP YES

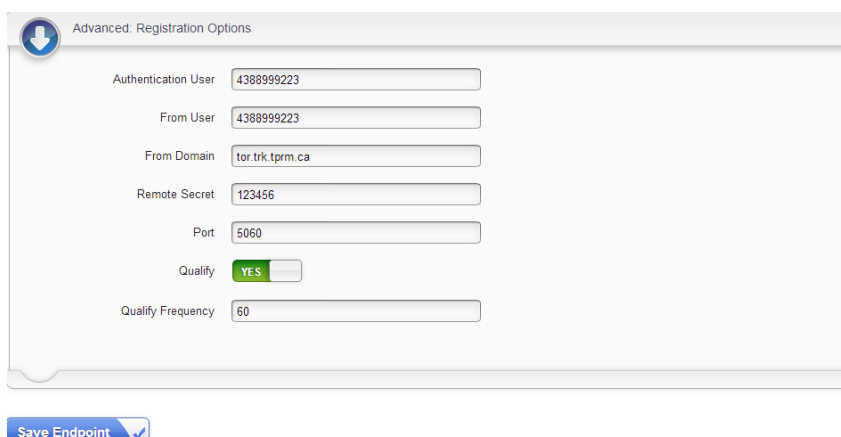
Use TCP NO

NAT Traversal No

Advanced: Registration Options

Save Endpoint

- On “Authentication User” same as pilot number
- On “From User” same as pilot number
- On “From Domain” same as “Hostname”
- On “Remote Secret” same as “Password”
- On “Port” 5060
- On “Qualify” enabled “YES”
- On “Qualify Frequency” 60
- Click on “Save Endpoint”



Advanced: Registration Options

Authentication User 4388999223

From User 4388999223

From Domain tor.trk.tprm.ca

Remote Secret 123456

Port 5060

Qualify YES

Qualify Frequency 60

Save Endpoint

1.6 CALL SETTINGS

- Click on TAB “Call Settings”
- Configure all Parameters as shown below

Edit SIP Endpoint "ThinkTel"

 Main
 Call Settings
 Media Settings
 Fax Settings

DTMF Settings [?](#)

DTMF Mode:

Caller ID Settings [?](#)

Trust Remote-Party-ID: NO

Send Remote-Party-ID:

Caller ID Presentation:

Signaling Settings [?](#)

Advanced: Signaling Settings

Progress Inband:

Allow Overlap Dialing: NO

Append user=phone to URI: NO

Add Q.850 Reason Headers: NO

Honor SDP Version: YES

Allow Transfers: YES

Authenticate Incoming Calls: NO

Allow Promiscuous Redirects: NO

Max Forwards:

Send TRYING on REGISTER: NO

Outbound Proxy:

Save Endpoint

Capture Rectangular Area Ctrl+R

Timer Settings [?](#)

Advanced: Timer Settings

Default T1 Timer:

Call Setup Timer:

Session Timers:

Minimum Session Refresh Interval:

Maximum Session Refresh Interval:

Session Refresher:

Save Endpoint

- Click on “Save Endpoint”

1.7 MEDIA SETTINGS

- Click on Tab “Media Settings”
- Enable “ULAW” and “G729”
- Disable “ALAW”, “G722”, “G726”, “GSM”

The screenshot shows the configuration page for SIP Endpoint "ThinkTel" in the digium Gateway. The "Media Settings" tab is active. Under "Available Media Types", ULAW and G729 are enabled (ON), while ALAW, G722, G726, and GSM are disabled (OFF). The "Media Preferences" section shows a "Codec Priority" table with ULAW at priority 1 and G729 at priority 2. The "Codec Options" section includes settings for packetization rates (all set to 20 milliseconds) and various suppression options (all set to NO).

Available Media Types

ULAW (Default)	<input checked="" type="checkbox"/> ON	ALAW (Default)	<input type="checkbox"/> OFF	G722 (Default)	<input type="checkbox"/> OFF
G726 (Default)	<input type="checkbox"/> OFF	G729 (Default)	<input checked="" type="checkbox"/> ON	GSM (Default)	<input type="checkbox"/> OFF

Media Preferences

Codec Priority

Move	Priority	Codec
↕ ₁	1	ULAW
↕ ₂	2	G729

Codec Options

- ALAW Packetization Rate: 20 milliseconds
- ULAW Packetization Rate: 20 milliseconds
- GSM Packetization Rate: 20 milliseconds
- G722 Packetization Rate: 20 milliseconds
- G726 Packetization Rate: 20 milliseconds
- G726 Nonstandard: NO
- G729 Packetization Rate: 20 milliseconds
- Silence Suppression (G729 only): NO
- Voice Activity Detection (G729 only): NO
- Use Preferred Codec Only: NO

Save Endpoint ✓

- Click on “Save Endpoint”

1.8 GLOBAL SIP SETTINGS

- Click on “Configuration” >> “Global SIP Settings”
- Configure all Parameters as shown below



Note: These settings apply to all SIP traffic and are for experienced administrators. Please take care when modifying any of these settings. The default values should be sufficient for many applications.

General [?](#)

UDP Bind Port

Enable TCP NO

TCP Bind Port

TCP Authentication Timeout

TCP Authentication Limit

Enable Hostname Lookup YES

NAT Settings [?](#)

Local Network
Format: 192.168.0.0/255.255.0.0 or 172.16.0.0/12

Local Network List

Local Network
None

Subscribe Network Change Event NO



Advanced: NAT Settings

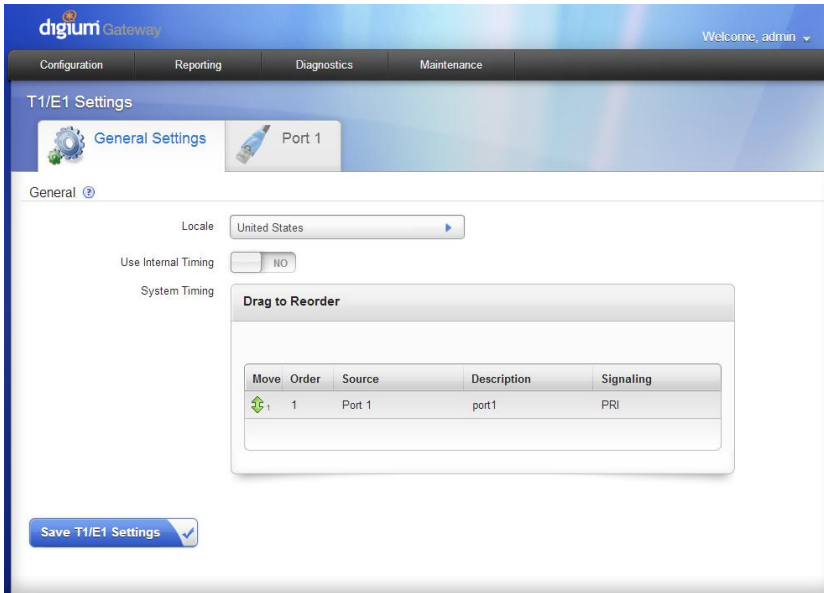
RTP Settings [?](#)

Start of RTP Port Range

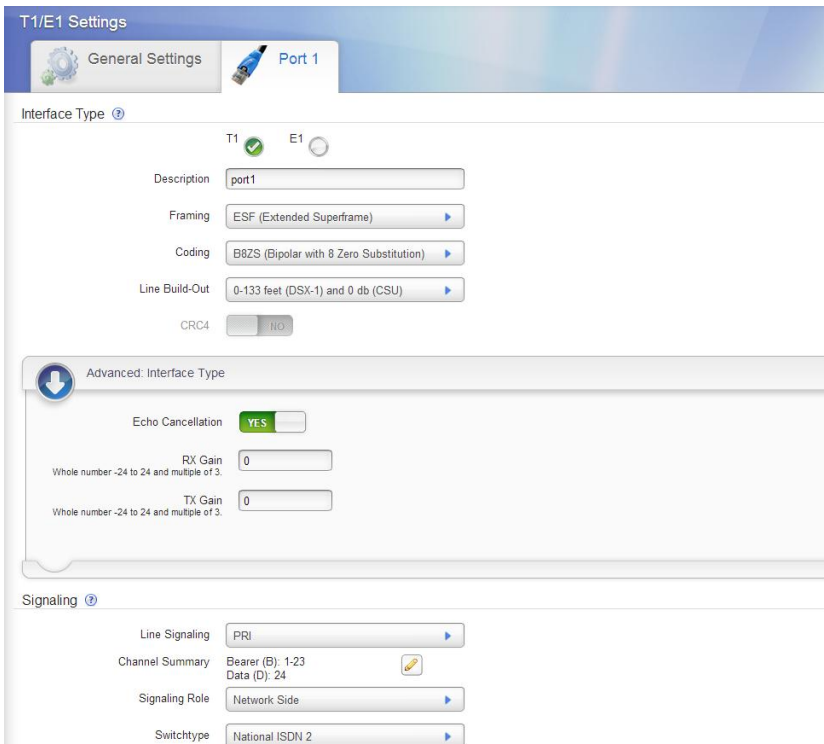
End of RTP Port Range

1.9 T1/E1 CONFIGURATION

- Click on “Configuration” >> “T1/E1”



- Click on Tab “Port 1”
- Configure all Parameters as shown below



Advanced: Signaling

Q.SIG Channel Mapping

Enable Caller ID

PRI Options

PRI Dial Plan for Dialed Number

PRI Dial Plan for Dialing Number

International Prefix

National Prefix

Local Prefix

Private Prefix

Unknown Prefix

Network Specific Facility (NSF) Messages

Idle Bearer Reset

Idle Bearer Reset Period

Overlap Dialing

Allow Progress When Call Released

Out-of-Band Indications

Facility-based ISDN Supplementary Services

Exclusive Channel Selection

Outbound Channel Selection

Ignore Remote Hold Indications

Block Outbound Caller ID Name

Wait for Caller ID Name

ISDN Timers

Layer 2 Outstanding Unacknowledged I-Frames - K

Layer 2 Number of Frame Retransmissions - N200

Layer 2 Frame Retransmission Time - T200

Layer 2 Time Without Frame Exchange - T203

Disconnect Acknowledge - T305

Release Acknowledge - T308

Enable Maintain Calls on Layer 2 Disconnection

Maintain Calls on Layer 2 Disconnection - T309

Connect Acknowledge - T313

E&M Options

Answer on Polarity Switch

Hangup on Polarity Switch

Polarity on Answer Delay

Pre-Wink Time

Wink Time

Start Time

Receiver Wink Time

Pre-Flash Time

Flash Time

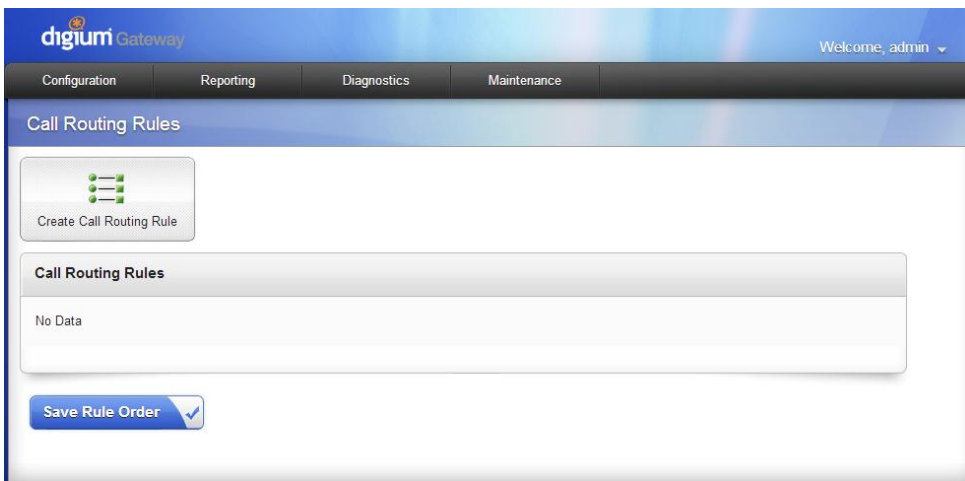
Receiver Flash Time

De-Bounce Timing

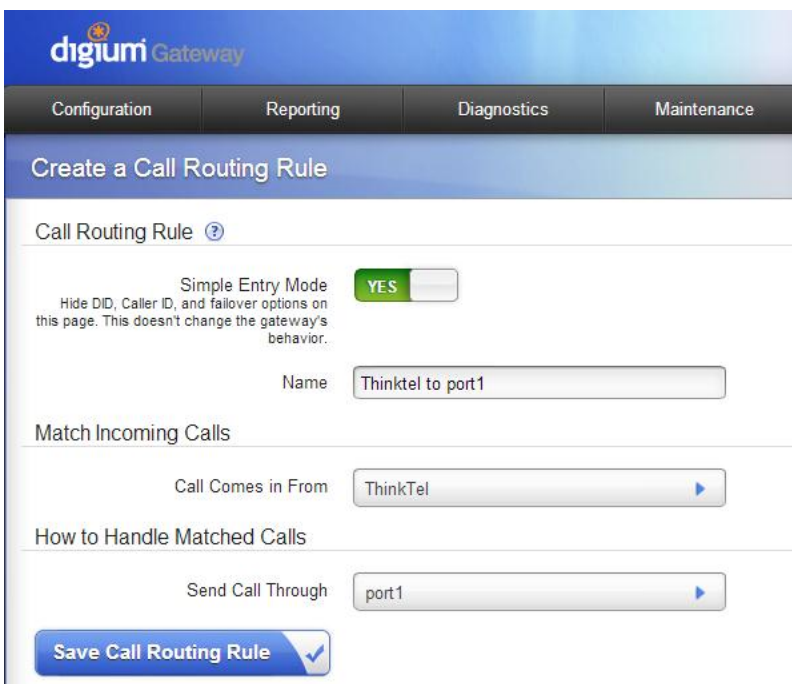
- Click on “Save T1/E1 Settings”

1.10 CALL ROUTING RULES

- Click on “Configuration” >> “Call Routing Rules”



- Click on “Create Call Routing Rule”



- Enable “Simple Entry Mode”
- On “Name” enter a name for this incoming rule example “ThinkTel to Port1”
- On “Call Comes in From” enter the name of the SIP Endpoint already created “ThinkTel”
- On “Send Call Through” enter “Port1”
- Click on “Save Call Routing Rule”
- Click again on “Create Call Routing Rule”

digium Gateway

Configuration Reporting Diagnostics Maintenance

Create a Call Routing Rule

Call Routing Rule ?

Simple Entry Mode YES
Hide DID, Caller ID, and failover options on this page. This doesn't change the gateway's behavior.

Name

Match Incoming Calls

Call Comes in From

How to Handle Matched Calls

Send Call Through

Save Call Routing Rule ✓

- Enable “Simple Entry Mode”
- On “Name” enter a name for this outgoing rule example “Port1 to ThinkTel”
- On “Call Comes in From” enter “port1”
- On “Send Call Through” enter the name of the SIP Endpoint already created “ThinkTel”
- Click on “Save Call Routing Rule”

digium Gateway Welcome, admin

Configuration Reporting Diagnostics Maintenance

Call Routing Rules

Create Call Routing Rule

Move	Order	Rule Name	From	To	Match	DID Manipulation	Actions
↕ 1	1	Thinktel to port1	ThinkTel	port1	All	None	
↕ 2	2	Port1 to Thinktel	port1	ThinkTel	All	None	

Save Rule Order ✓

1.11 CONNECTION STATUS

- Click on “Diagnostics” >> “Connection Status”
- On the Tab “Network” verify the connection status of the interface ETH1 (Connected)

The screenshot shows the digium Gateway interface with the 'Connection Status' section. The 'Network' tab is selected, showing 'Network Connection Status'. Below this, there is a 'Network Interfaces' section with a table listing the status of network interfaces.

Interface Name	Speed	IP Address	Interface Status
eth1	100Mb/s	192.168.1.202	Connected

- On the Tab “SIP Endpoints” verify the connection status of the SIP-TRUNK (registered)

The screenshot shows the digium Gateway interface with the 'Connection Status' section. The 'SIP Endpoints' tab is selected, showing 'SIP Endpoint Connection Status'. Below this, there is a 'SIP Endpoints' section with a table listing the status of SIP endpoints.

Endpoint Name	Registration	Hostname	Registration Status	Latency
ThinkTel	out	206.80.250.100	Registered	Unmonitored

- On the Tab “T1/E1 Interfaces” verify the connection status of the PRI (UP,Active)

The screenshot shows the digium Gateway interface with the 'Connection Status' section. The 'T1/E1 Interfaces' tab is selected, showing 'T1/E1 Status'. Below this, there is a 'T1/E1 Interface' section with a table listing the status of T1/E1 interfaces.

Port	Name	Signaling	Status	ERRORS
1	port1	PRI	Up, Active	Timing Slips: 1

1.12 OUTGOING AND INCOMING CALLS

- Make outgoing and incoming calls
- Click on “Reporting” >> “Statistics”
- Verify the Active Calls
- Verify the Calls Processed

The screenshot shows the digium Gateway interface. The top navigation bar includes Configuration, Reporting, Diagnostics, and Maintenance. The 'Reporting' tab is active, and the 'Statistics' sub-tab is selected. The main content area displays the following statistics:

- Active Calls: 3
- Calls Processed: 24

Below the statistics is a section titled 'Active Calls' with a sub-header 'Showing: ThinkTel (SIP) to port1 (T1/E1) (3 total)'. It contains a table with the following data:

In	Out	Dialed Number
ThinkTel (SIP)	port1 (T1/E1)	4388999223
ThinkTel (SIP)	port1 (T1/E1)	4388999248
port1 (T1/E1)	null (T1/E1)	

1.13 BACK UP THE CONFIGURATION

- Click on “Maintenance” >> “Backups”
- Click on “Download Backup” , Save the zipped File

The screenshot shows the digium Gateway interface. The top navigation bar includes Configuration, Reporting, Diagnostics, and Maintenance. The 'Maintenance' tab is active, and the 'Backups' sub-tab is selected. The main content area displays two buttons: 'Download Backup' and 'Restore Backup'.

1.14 FIREWALL CONFIGURATION

- If you are connected to the proxy edm.trk.tprm.ca (208.68.17.52) Primarily assigned to Western Canada base PBX trunks you will need to allow :
 - 1- UDP port 5060 for SIP signaling
 - 2- UDP ports 10000-65500 for 208.68.17.32/27 , 206.80.250.96/27 & 209.197.133.0/26
- If you are connected to the proxy tor.trk.tprm.ca (206.80.250.100) Primarily assigned to Eastern Canada base PBX trunks you will need to allow :
 - 1-UDP port 5060 for SIP signaling
 - 2-UDP ports 10000-65500 for 208.68.17.32/27, 206.80.250.96/27 & 209.197.133.0/26