



APN006 – SMS Gateway with Failover Detection

APN006 - 06 August, 2010

1. Introduction

Ctek's SMS Gateway application provides an out-of-band (SMS) communications path for intelligent end-point controllers such as PLCs and custom industrial control solutions. The SMS Gateway application works in tandem with the standard communications capabilities of the SkyRouter during normal operation to determine the health of the bearer channel (network IP connection) and reacts to bearer channel failures by routing controller messages over the SMS network to a far end server. As an added benefit the SMS Gateway application makes controller information available to a conventional wireless handset upon request. Figure 1 depicts the basic architecture of the application.

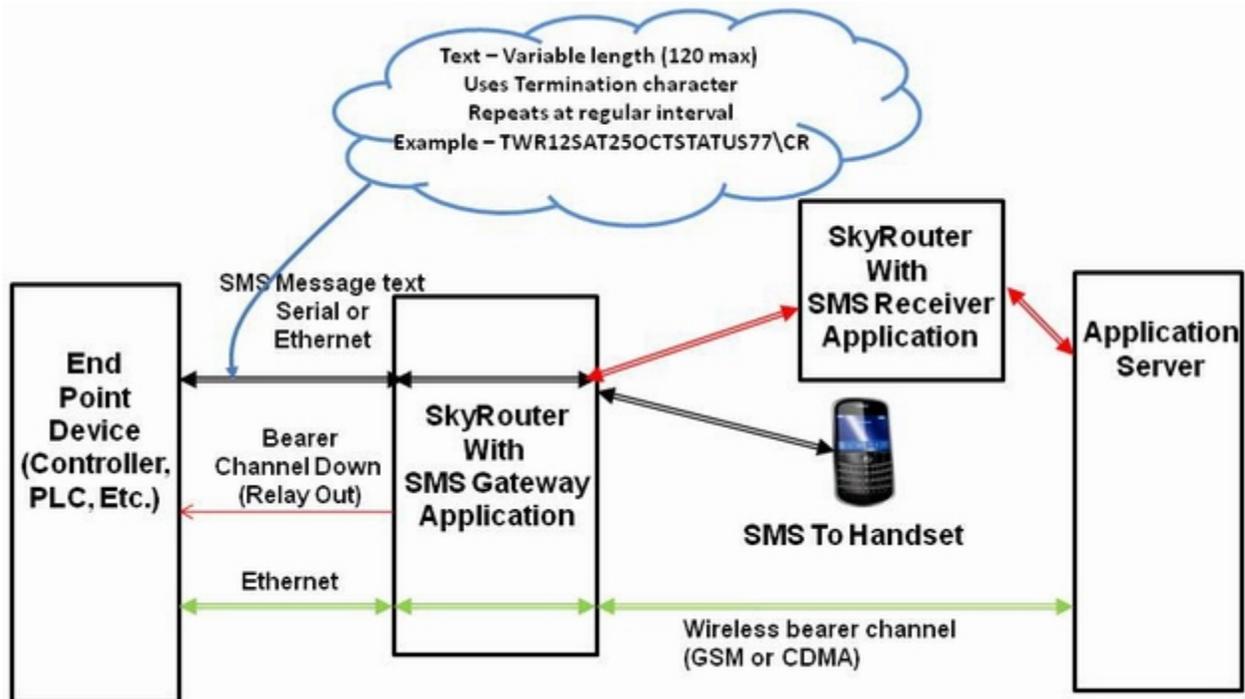


Figure 1

2. Theory of Operation

Referring to Figure 1 we see that during normal operation the endpoint controller is messaging on the wireless IP bearer channel shown in green. Simultaneously the controller is supplying a text message over



APN006 – SMS Gateway with Failover Detection

APN006 - 06 August, 2010

either a serial connection or over the TCP/IP connection. During normal operation (black) these messages are available for SMS capable terminals such as handsets but are not passed on to the far end application server.

When the SMS Gateway application detects a failure on the networks bearer channel it (optionally) asserts a relay contact signal back to the controller and begins to pass the text message back to another SkyRouter configured as an SMS receiver (red path). The receiver then repackages the incoming text messages as TCP/IP messages and sends them to the configured server address and port. Text messages originating from the controller continue to be available for SMS capable handsets. An SMS receiver can serve many endpoints, the number being dependent on the amount of traffic being sent.

The text message sent from the controller can contain up to 120 valid ASCII characters and can be define during setup to be bracketed by a Start and End character which do not count against the 120 character limit. Start and End characters must be unique meaning that they cannot be used in the message payload.

3. SMS Gateway Application - End Point Configuration

Figure 2 below shows the configuration screen for the SMS Gateway End Point application. This configuration must be consistent across a network of end points that will operate with one specific SMS Receiver.

Current Status: Operating In Normal Mode

Enable SMS Failover: Yes No

MSISDN of SMS Destination:

----- Primary Failover Test -----

Ping The Following:

----- Secondary Failover Test -----

Disabled

Test Rate (Seconds):

Retry Rate (Seconds):

Retry Count:

Configure SMS Data Source

Receive SMS Traffic From: DB9 Serial Port Aux Serial Port LAN TCP Connection

TCP Port Number:

Start of Message Character (Dec):

End of Message Character (Dec):

Figure 2



APN006 – SMS Gateway with Failover Detection

APN006 - 06 August, 2010

End Point Application Setup (screen fields and settings)

Enable SMS Failover - Turn the failover detection logic on or off

MSISDN of SMS Destination - The 10-digit phone number of the SMS receiver. For shorter dialing plans this number should be padded with zeros.

Primary and Secondary Failover Test - Up to two failover tests that can be performed to assess the health of the network's bearer channel. Options are to ping (ICMP message) an IP address, to resolve a domain name, or to disable the detection.

Test Rate - The repetition rate at which the failover test will be performed.

Retry Rate - The time interval before a failover test will be performed again.

Retry Count - The number of times that a failover test will be performed before failover is determined to be necessary.

Receive SMS Traffic From - Selects the physical connection to the end point controller for SMS messages.

TCP Port Number - The TCP port that will be listened to if SMS traffic is coming in on Ethernet

Start Message Character - The numeric value of the character defined as the Start character. Value is in decimal. This character must not be used in the message payload. Must be an ASCII character but need not be a printable character. STX would be a candidate but any character can be used. If Null (00) no Start character is defined.

End Message Character - The numeric value of the character defined as the End character. Value is in decimal. This character must not be used in the message payload. Must be an ASCII character but need not be a printable character. ETX would be a candidate but any character can be used. If Null (00) no End character is defined.



APN006 – SMS Gateway with Failover Detection

APN006 - 06 August, 2010

4. SMS Gateway Application - SMS Receiver Configuration

Figure 3 below shows the configuration screen for the SMS Gateway - SMS Receiver application. This configuration may be repeated in additional SMS Receivers to add capacity as required.

The screenshot shows a configuration window titled "Configure SMS Data Destination". It contains several fields and radio buttons. The "Forward SMS Traffic To:" section has three radio buttons: "DB9 Serial Port", "Aux Serial Port", and "LAN TCP Connection", with the latter being selected. Below this are four text input fields: "Destination IP Address" with the value "192.168.1.195", "Destination Port Number" with "6000", "Start of Message Character (Dec):" with "91", and "End of Message Character (Dec):" with "93". At the bottom of the window are two buttons: "Update" and "Back".

SMS Receiver Application Setup (screen fields and settings)

Forward SMS Traffic To - Selects the physical connection to the far end application server or communications device

Destination IP Address - The IP address of the far end application server or communications device if LAN TCP connection is selected

Destination Port Number - The IP port of the far end application server or communications device if LAN TCP connection is selected

Start Of Message Character - Must be the same as the corresponding character selected at the end point.

End of Message Character - Must be the same as the corresponding character selected at the end point.

Important Note - When settings are made or changed on any SkyRouter configuration screen the screens update button must be pushed and then a Restart (top menu) must be performed.



APN006 – SMS Gateway with Failover Detection

APN006 - 06 August, 2010

5. Relay Output Management Screen

Log in to the SkyRouter using Ethernet at 192.168.1.10, UID = ctek, password = ctek and select the Relay Output screen. The screen is shown in figure 5 below.

The screenshot shows the 'Relay Output Configuration' web interface. At the top left is the Ctek logo. The title 'Relay Output Configuration' is in red. Below the title are three settings: 'Set Relay Output State' with radio buttons for 'Off' (selected) and 'On'; 'Relay Initial Value' with a dropdown menu set to 'On'; and 'Relay Shut Off Timer' with a dropdown menu set to 'Never'. A large rectangular box contains four more settings: 'Allow SMS Control Of Relay' with radio buttons for 'Yes' and 'No' (selected); 'Allow Web Browser Control Of Relay' with radio buttons for 'Yes' and 'No' (selected); 'Web Browser Display Polarity' with radio buttons for 'Normal' (selected) and 'Reversed'; and 'Text For Web Link To Relay' with an empty text input field. At the bottom are two buttons: 'Update' and 'Home'.

Figure 3



APN006 – SMS Gateway with Failover Detection

APN006 - 06 August, 2010

Set Relay Output State - Used to turn the relay on or off. Select desired setting and then click on the update button at bottom of screen.

Relay Initial Value - Sets the initial condition of the relay on power up. Setting choices are *On*, *Off*, or *Last* where last will cause the relay to be restored to the state it was in when the unit powered down.

Relay Shut Off Timer - Provides a watch dog timer to turn relay off after a prescribed length of time. Select *Never* to disable timer.

Allow SMS Control of Relay - Enable or disable the ability to change the state of the relay using SMS (text messaging) commands.

Allow Web Browser Control of Relay - Enable or disable the ability to change the state of the relay using the Relay Output web screen.

Web Browser Display Polarity - Using the web link text field below the user can create a relay control link that appears on the initial login screen. This is called advertising the resource or simply advertising. As an example figure 6 shows an advertising screen where the text entered into the Relay Output screen was *Power Control Relay*. The IP Camera advertising link comes from a text field on the Routing screen and the Admin Facilities link takes you to the standard SkyRouter administration menu. For text advertised from the Relay Control screen the button on the advertised link displays either OFF or ON depending on the state of the relay. However a closed relay is sometimes an ON and sometimes an OFF. The polarity setting allows the user to address this issue when setting up the relay link.



98.129.165.7



Figure 4



APN006 – SMS Gateway with Failover Detection

APN006 - 06 August, 2010

Text For Web Link To Relay - Used to enter the text to be used for a relay advertising link. If blank relay advertising will not occur.

Note - Changes to fields and selections other than Set Relay Output State require that the change be followed by an update and then by a restart of the unit. Set Relay Output State is unique in that it only requires an Update to toggle the relay.

6. SMS (text messaging) Commands

SMS commands provide an economical method of communicating with the SkyRouter for simple status and management activities. SMS has the added advantage of not requiring the bearer channel (IP data) to be working. Therefore it can be thought of as an out of band management tool. Complete documentation on all SkyRouter SMS commands can be found in TechNote TN0009 available on www.ctekproducts.com. SMS commands sent to SkyRouters on GSM networks (GPRS/EDGE/UMTS/HSPA) must be preceded by three equals signs as in ===STATUS. On CDMA networks the equal signs are optional. The first letter of a SMS command must be upper case, all others can be upper or lower case.

Action	SMS Command Text
Get SkyRouter Status	===STATUS
Reboot SkyRouter	===Boot
Have SkyRouter update DDNS	===WAKE
Turn Relay On	===R1
Turn Relay Off	===R0
Get last text message sent to SMS Gateway application by end point controller	===GET