

# NR500 Series Industrial Cellular VPN Router

## Application Note 001

### Link Manager\_Dual SIM Failover Strategy

**Version:** V1.0.0  
**Date:** Jul 2018  
**Status:** Confidential



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# 1 Introduction

## 1.1 Overview

This document contains information regarding the configuration and use of dual SIM failover strategy.

This guide has been written for use by technically competent personnel with a good understanding of the communications technologies used in the product, and of the requirements for their specific application.

## 1.2 Compatibility

This application note applies to:

**Models Shown:** NR500 series.

**Firmware Version:** V1.0.0(903.0) or newer

**Other Compatible Models:** None

## 1.3 Version

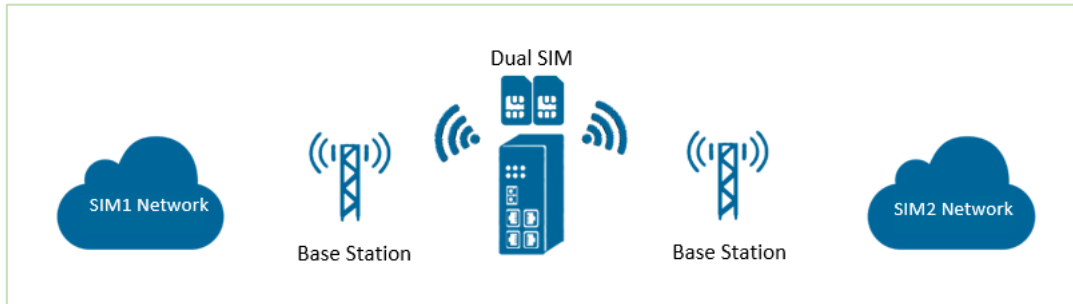
Updates between document versions are cumulative. Therefore, the latest document will include all the content of previous versions.

Release Date	Doc. Version	Firmware Version	Change Description
2018/07/28	V1.0.0	V1.0.0(903.0)	First released

## 1.4 Rectifications

Appreciate for corrections or rectifications to this application note, and if any request for new application notes please email to: **support@navigateworx.com**

## 2 Topology



1. Two SIMs cards are inserted into NR500 Pro router, SIM1 as main and SIM2 as backup.
2. If SIM1 fails to connect to Internet, then NR500 Pro will switch to SIM2 to provide continual network connection.

## 3 Configuration

### 3.1 Internet connection.

1. Insert your SIM card for internet access. Make sure your internet connection is well connected.

Active Link Information	
Link Type	WWAN1
IP Address	10.148.30.147
Netmask	255.255.255.248
Gateway	10.148.30.148

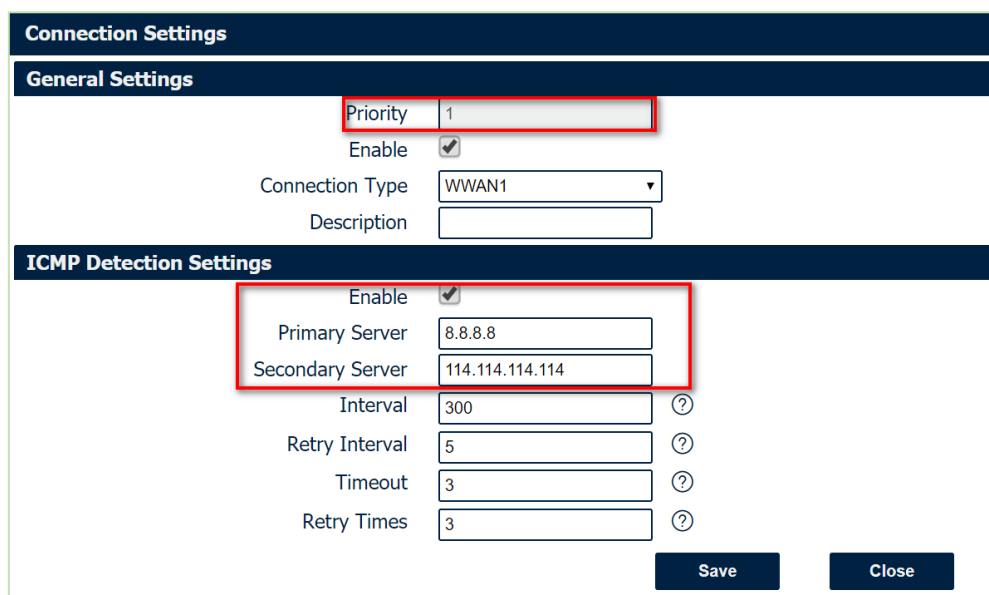
### 3.2 Dual SIMs Strategy Configuration

1. Go to Link **Management>Connection Manager>Connection**, Click the **Edit** button of WWAN1 and WWAN2.



Priority	Enable	Connection Type	Description
1	true	WWAN1	
2	true	WWAN2	

2. Specify WWAN1 as the link of Priority1, which means that the WWAN1 is primary link. Enable ICMP detection. Click **Save**.



**Connection Settings**

**General Settings**

Priority: 1

Enable:

Connection Type: WWAN1

Description:

**ICMP Detection Settings**

Enable:

Primary Server: 8.8.8.8

Secondary Server: 114.114.114.114

Interval: 300

Retry Interval: 5

Timeout: 3

Retry Times: 3

Save Close

3. Specify WWAN2 as the link of Priority2, which means that the WWAN2 is

backup link. Enable ICMP detection. Click **Save**.

Connection Settings	
<b>General Settings</b>	
Priority	<input type="text" value="2"/>
Enable	<input checked="" type="checkbox"/>
Connection Type	<input type="text" value="WWAN2"/>
Description	<input type="text"/>
<b>ICMP Detection Settings</b>	
Enable	<input checked="" type="checkbox"/>
Primary Server	<input type="text" value="8.8.8.8"/>
Secondary Server	<input type="text" value="114.114.114.114"/>
Interval	<input type="text" value="300"/> ?
Retry Interval	<input type="text" value="5"/> ?
Timeout	<input type="text" value="3"/> ?
Retry Times	<input type="text" value="3"/> ?
<input type="button" value="Save"/> <input type="button" value="Close"/>	

4. Click **Save>Apply**.

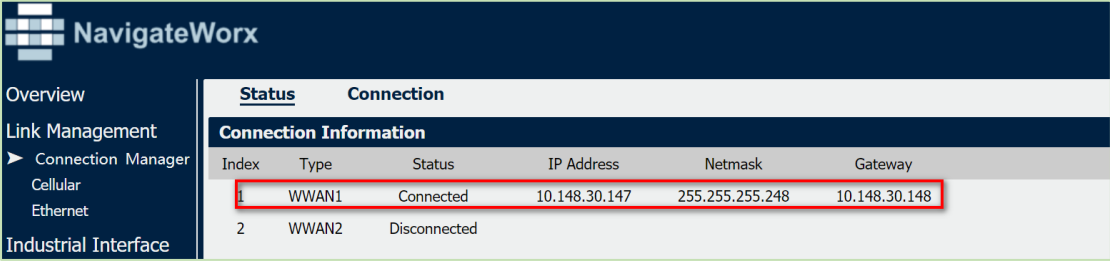
## 4 Testing

### 4.1 Internet Status

1. Go to **Overview>Overview>Active Link Information**, the current Link is WWAN1.

Active Link Information	
Link Type	WWAN1
IP Address	10.148.30.147
Netmask	255.255.255.248
Gateway	10.148.30.148

2. Go to **Link Management>Connection Manager>Status**, only show the information of WWAN1.

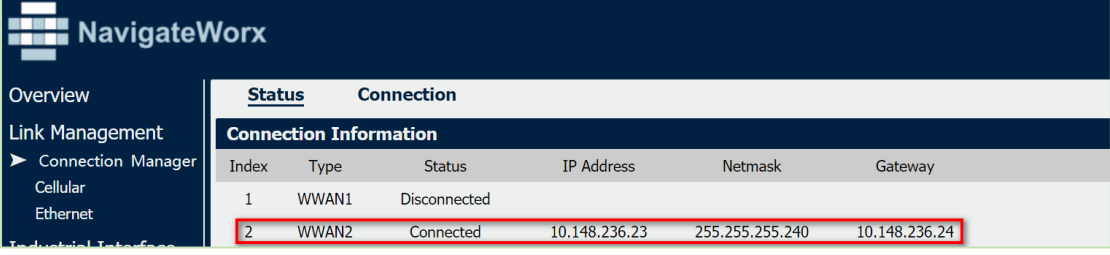


Status		Connection			
Connection Information					
Index	Type	Status	IP Address	Netmask	Gateway
1	WWAN1	Connected	10.148.30.147	255.255.255.248	10.148.30.148
2	WWAN2	Disconnected			

### 4.2 Test Result

1. When WWAN1 fail to connect to Internet(ICMP ping fail), WWAN2 will be active and connect to Internet. Check the Internet status after switching the SIM card.

Active Link Information	
Link Type	WWAN2
IP Address	10.148.236.23
Netmask	255.255.255.240
Gateway	10.148.236.24



Status		Connection			
Connection Information					
Index	Type	Status	IP Address	Netmask	Gateway
1	WWAN1	Disconnected			
2	WWAN2	Connected	10.148.236.23	255.255.255.240	10.148.236.24

## 4.3 Syslog

Syslog shows the SIM card switch process, only the information relevant above configuration will be explain below:

```
=====
Jun 12 08:00:07 navigatworx user.debug modem[1185]: modem init with SIM1
Jun 12 08:00:07 navigatworx user.debug modem[1185]: power on the modem
Jun 12 08:00:08 navigatworx user.debug modem[1185]: AT command port(/dev/ttyUSB4) was
opened
Jun 12 08:00:08 navigatworx user.debug modem[1185]: ATZ
Jun 12 08:00:09 navigatworx user.debug modem[1185]: ATZ^M
Jun 12 08:00:09 navigatworx user.debug modem[1185]: OK
Jun 12 08:00:09 navigatworx user.debug modem[1185]: ATE0
Jun 12 08:00:09 navigatworx user.debug modem[1185]: ATE0^M
Jun 12 08:00:09 navigatworx user.debug modem[1185]: OK
Jun 12 08:00:09 navigatworx user.debug modem[1185]: AT+GMM
Jun 12 08:00:09 navigatworx user.debug modem[1185]: EC25
Jun 12 08:00:09 navigatworx user.debug modem[1185]: OK
Jun 12 08:00:09 navigatworx user.debug modem[1185]: AT+CFUN=1
Jun 12 08:00:10 navigatworx user.debug modem[1185]: OK
Jun 12 08:00:10 navigatworx user.debug modem[1185]: AT+CGMR
Jun 12 08:00:10 navigatworx user.debug modem[1185]: EC25EFAR06A01M4G
Jun 12 08:00:10 navigatworx user.debug modem[1185]: OK
Jun 12 08:00:10 navigatworx user.debug modem[1185]: AT+CPIN?
Jun 12 08:00:10 navigatworx user.debug modem[1185]: +CPIN: READY
Jun 12 08:00:10 navigatworx user.debug modem[1185]: OK
Jun 12 08:00:10 navigatworx user.debug modem[1185]: AT+CIMI
Jun 12 08:00:10 navigatworx user.debug modem[1185]: 460018084095242
Jun 12 08:00:10 navigatworx user.debug modem[1185]: OK
Jun 12 08:00:10 navigatworx user.debug modem[1185]: AT+CGREG=2
Jun 12 08:00:10 navigatworx user.debug modem[1185]: OK
Jun 12 08:00:10 navigatworx user.debug modem[1185]: AT+CGDCONT=1,"IP"
Jun 12 08:00:10 navigatworx user.debug modem[1185]: OKJun 12 08:00:27 navigatworx
user.debug connection_manager[1115]: modem is ready, ifname=wwan1 sim=1
Jun 12 08:00:27 navigatworx user.debug connection_manager[1115]: start dhcp for wwan1
Jun 12 08:00:27 navigatworx daemon.err udhcpc[1575]: started, v1.25.1
Jun 12 08:00:27 navigatworx daemon.err udhcpc[1575]: sending discover
Jun 12 08:00:27 navigatworx daemon.err udhcpc[1575]: sending select for 10.44.201.229
Jun 12 08:00:27 navigatworx daemon.err udhcpc[1575]: lease of 10.44.201.229 obtained, lease
time 7200
Jun 12 08:00:27 navigatworx user.debug udhcpc: dhcpc get configuration of wwan1
Jun 12 08:00:27 navigatworx user.debug connection_manager[1115]: connection of wwan1 is
connected
Jun 12 08:00:27 navigatworx user.debug connection_manager[1115]: setup active link wwan1
```



**Jun 12 08:00:27 navigateworx user.debug connection\_manager[1115]: start ICMP detecting(wwan1->8.8.8.8/114.114.114.114)**

Jul 29 11:18:40 navigateworx user.debug modem[1185]: +CGREG: 2,1,"2508","6016C02",7

Jul 29 11:18:40 navigateworx user.debug modem[1185]: OK

Jul 29 11:18:40 navigateworx user.debug connection\_manager[1115]: connection\_manager proc\_icmp\_detection

**Jul 29 11:18:40 navigateworx user.debug connection\_manager[1115]: WWAN1 ICMP detecting failed (1/3)**

Jul 29 11:18:43 navigateworx user.debug connection\_manager[1115]: timer proc status = 2

**Jul 29 11:18:43 navigateworx user.debug connection\_manager[1115]: start ICMP detecting(wwan1->8.8.8.8/114.114.114.114)**

Jul 29 11:18:49 navigateworx user.debug connection\_manager[1115]: connection\_manager proc\_icmp\_detection

**Jul 29 11:18:49 navigateworx user.debug connection\_manager[1115]: WWAN1 ICMP detecting failed (2/3)**

Jul 29 11:18:50 navigateworx user.debug modem[1185]: OK

Jul 29 11:18:52 navigateworx user.debug connection\_manager[1115]: timer proc status = 2

**Jul 29 11:18:52 navigateworx user.debug connection\_manager[1115]: start ICMP detecting(wwan1->8.8.8.8/114.114.114.114)**

Jul 29 11:18:55 navigateworx daemon.info urandom\_seed[1338]: Seed saved (/etc/urandom.seed)

Jul 29 11:18:58 navigateworx user.debug connection\_manager[1115]: connection\_manager proc\_icmp\_detection

**Jul 29 11:18:58 navigateworx user.debug connection\_manager[1115]: WWAN1 ICMP detecting failed (3/3)**

Jul 29 11:18:59 navigateworx user.debug modem[1185]: link wwan1 disconnected

Jul 29 11:18:59 navigateworx daemon.err udhcpc[1593]: entering released state

Jul 29 11:18:59 navigateworx user.debug connection\_manager[1115]: connection of wwan1 is disconnected

Jul 29 11:18:59 navigateworx user.debug connection\_manager[1115]: optimal connection wwan2 health state 1 cs 0, current connection wwan1 health state 4 cs 0

**Jul 29 11:18:59 navigateworx user.debug connection\_manager[1115]: SIM switch from SIM1 to SIM2, reload modem with SIM2**

Jul 29 11:18:59 navigateworx user.debug connection\_manager[1115]: ll wwan2 modem[1185]: modemd exit

Jul 29 11:19:09 navigateworx user.debug modem[2360]: modem init with SIM2

Jul 29 11:19:09 navigateworx user.debug modem[2360]: power on the modem

Jul 29 11:19:09 navigateworx user.debug modem[2360]: searching AT command port

Jul 29 11:19:23 navigateworx user.debug modem[2360]: ATZ

Jul 29 11:19:23 navigateworx user.debug modem[2360]: ATZ^M

Jul 29 11:19:23 navigateworx user.debug modem[2360]: OK

Jul 29 11:19:23 navigateworx user.debug modem[2360]: ATE0

Jul 29 11:19:23 navigateworx user.debug modem[2360]: ATE0^M

Jul 29 11:19:23 navigateworx user.debug modem[2360]: OK

```
Jul 29 11:19:23 navigatworx user.debug modem[2360]: AT+GMM
Jul 29 11:19:24 navigatworx user.debug modem[2360]: EC25
Jul 29 11:19:24 navigatworx user.debug modem[2360]: OK
Jul 29 11:19:24 navigatworx user.debug modem[2360]: AT+CFUN=1
Jul 29 11:19:24 navigatworx user.debug modem[2360]: OK
Jul 29 11:19:24 navigatworx user.debug modem[2360]: AT+CGMR
Jul 29 11:19:24 navigatworx user.debug modem[2360]: EC25EFAR06A01M4G
Jul 29 11:19:24 navigatworx user.debug modem[2360]: OK
Jul 29 11:19:24 navigatworx user.debug modem[2360]: +QIND: SMS DONE
Jul 29 11:19:25 navigatworx user.debug modem[2360]: OK
Jul 29 11:19:26 navigatworx user.debug modem[2360]: modem is ready
Jul 29 11:19:41 navigatworx user.debug connection_manager[1115]: modem is ready,
ifname=wwan2 sim=2
Jul 29 11:19:41 navigatworx user.debug connection_manager[1115]: start dhcp for wwan2
Jul 29 11:19:41 navigatworx daemon.err udhcpc[3000]: started, v1.25.1
Jul 29 11:19:41 navigatworx daemon.err udhcpc[3000]: sending discover
Jul 29 11:19:41 navigatworx daemon.err udhcpc[3000]: sending select for 10.148.236.23
Jul 29 11:19:41 navigatworx daemon.err udhcpc[3000]: lease of 10.148.236.23 obtained, lease
time 7200
Jul 29 11:19:41 navigatworx user.debug udhcpc: dhcpc get configuration of wwan2
Jul 29 11:19:41 navigatworx user.debug connection_manager[1115]: connection_manager
proc_connected
```