

NL-SW-LTE-WM14-x

Migration Overview

NimbeLink Corp.

Updated: November 2018



© NimbeLink Corp. 2018. All rights reserved.

NimbeLink Corp. provides this documentation in support of its products for the internal use of its current and prospective customers. The publication of this document does not create any other right or license in any party to use any content contained in or referred to in this document and any modification or redistribution of this document is not permitted.

While efforts are made to ensure accuracy, typographical and other errors may exist in this document. NimbeLink reserves the right to modify or discontinue its products and to modify this and any other product documentation at any time.

All NimbeLink products are sold subject to its published Terms and Conditions, subject to any separate terms agreed with its customers. No warranty of any type is extended by publication of this documentation, including, but not limited to, implied warranties of merchantability, fitness for a particular purpose and non-infringement.

Amazon Web Services, AWS, and AWS IoT are registered trademarks of Amazon Web Services

NimbeLink and Skywire are registered trademarks of NimbeLink Corp. All trademarks, service marks and similar designations referenced in this document are the property of their respective owners.

Table of Contents

Table of Contents	2
Introduction	3
Overview	3
Applicable WM14 Part Numbers	3
Recommended Alternative	3
Device Software	4
Overview	4
SMS Messaging	4
Socket Dials	4
Windows Users	4
Device Drivers	4
Data Connections over USB/UART in a Windows Environment	5
Linux Users	5
Device Drivers	5
Data Connections over USB/UART in a Linux Environment	5
PPP	5
CDC_ETHER	5
Hardware and Pinout Differences	6
Pinout Changes	6
Antenna Changes	7

1. Introduction

1.1 Overview

This document serves as a migration overview for customers who are transitioning from the NL-SW-LTE-WM14x Skywire modem to the NL-SW-LTE-S7648 Skywire modem. Provided within this document is information regarding similarities and differences for device hardware and software functionality.

Please note that the NL-SW-LTE-WM14 will be referred to in this document as the "WM14" and the NL-SW-LTE-S7648 will be referred to as the "S7648", for the sake of brevity.

1.2 Applicable WM14 Part Numbers

Orderable Device	Description	Carrier	Network Type
NL-SW-LTE-WM14	LTE CAT 1	AT&T	LTE
NL-SW-LTE-WM14-B	LTE CAT 1	AT&T	LTE
NL-SW-LTE-WM14-C	LTE CAT 1	AT&T	LTE

1.3 Recommended Alternative

Orderable Device	Description	Carrier	Network Type
NL-SW-LTE-S7648	LTE CAT 1	AT&T	LTE

2. Device Software

2.1 Overview

[Section 2.2](#) and [Section 2.3](#) contain information about SMS messaging and socket dials, respectively. These sections, and the documents referenced in these sections are common to users of Windows, Linux, and RTOS environments.

[Section 2.4](#) contains Windows-specific information for Windows users, while [Section 2.5](#) contains Linux-specific information for Linux users.

2.2 SMS Messaging

If you were using SMS messaging on the WM14, you may continue to do so on the S7648. See the guide below for detailed instructions on how to implement SMS on S7648:

https://nimbelink.com/Documentation/Skywire/30049_Skywire_SMS.pdf

2.3 Socket Dials

If you were using raw socket dials on the WM14, you may continue to do so on the S7648. The S7648 offers functionality for raw socket dials. See the guide below for detailed instructions:

https://nimbelink.com/Documentation/Skywire/4G_LTE_Cat_4/30228_NL-SW-LTE-S7588_SocketDial.pdf

2.4 Windows Users

2.4.1 Device Drivers

If you intend to use the S7648 in a Windows environment, you must first download the requisite drivers for the Skywire. Windows USB drivers for the S7648 are available on Sierra Wireless' website at the following link:

<https://source.sierrawireless.com/resources/airprime/software/hl854x-usb-drivers/>

However, please note that these drivers require the user to sign up for a free account with Sierra Wireless.

2.4.2 Data Connections over USB/UART in a Windows Environment

If you were using WNC's Connection Manager tool to create a cellular data connection in Windows using the WM14, you have two options for the S7648:

- MBIM
- CDC_ECM

MBIM protocol can be used to set up a data connection on Windows 8 and 10 using the S7648. See the guide below for more information:

https://nimbelink.com/Documentation/Skywire/4G_LTE_Cat_4/1001793_NL-SW-LTE_S7xxx_MBIM.pdf

Alternatively, CDC_ECM protocol can be used on Windows 7, 8 and 10 to the same effect. Please contact NimbeLink at the email address below to learn more:

product.support@nimbelink.com

It is recommended to first try MBIM mode, as CDC_ECM can be complicated to set up.

2.5 Linux Users

2.5.1 Device Drivers

No extra drivers for the S7648 are needed for Linux users.

2.5.2 Data Connections over USB/UART in a Linux Environment

2.5.2.1 PPP

If you were using PPP on the WM14, you can continue to use PPP on the S7648. Additionally, NimbeLink offers premade scripts to help set up a PPP connection. See the link below for more information:

https://nimbelink.com/Documentation/Skywire/4G_LTE_Cat_4/30222_NL-SW-LTE-S7588_PPP.pdf

2.5.2.2 CDC_ETHER

If you were using CDC_ETHER as the primary data connection protocol on WM14, the S7648 alternative is CDC_NCM. The two protocols are similar in nature, but require different setup procedures. A guide detailing the setup procedure for CDC_NCM on the S7648 is found at the link below:

https://nimbelink.com/Documentation/Skywire/4G_LTE_Cat_4/30248_NL-SW-LTE-S7588_NCM.pdf

3. Hardware and Pinout Differences

3.1 Pinout Changes

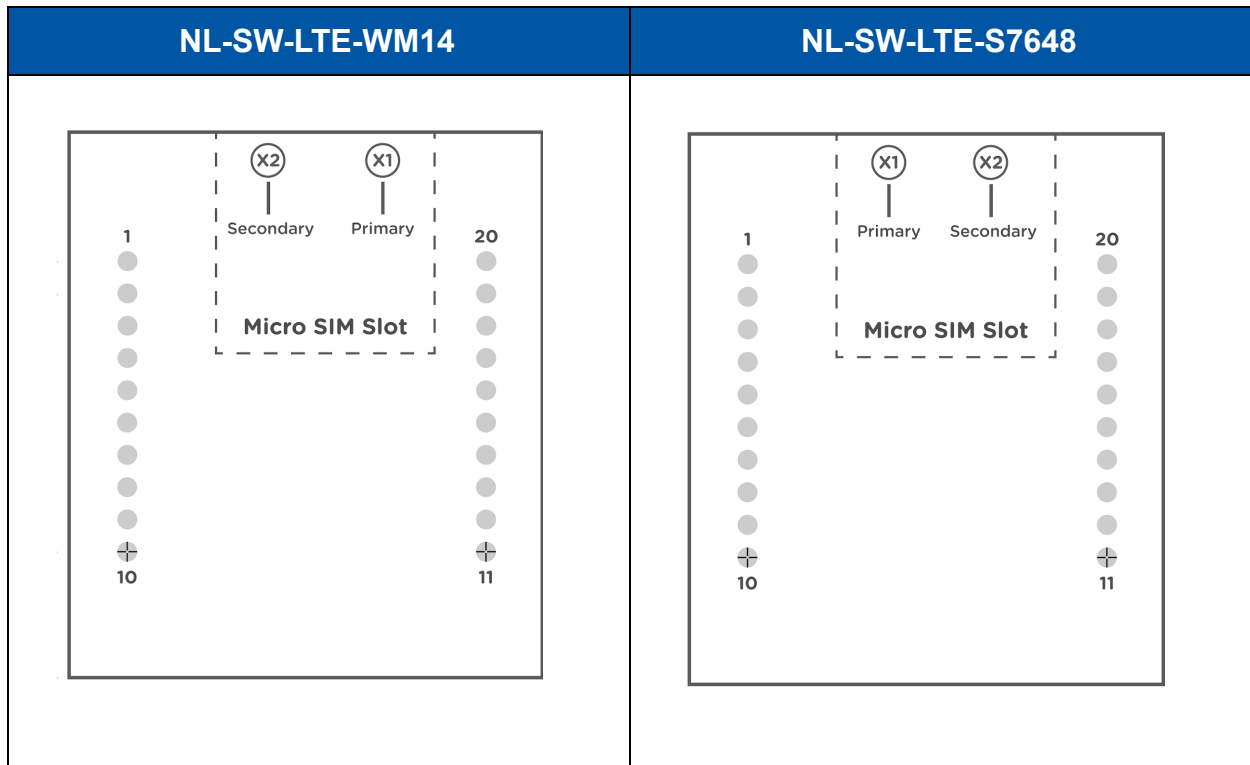
This section lists all pins that have different functionality on the S7648 relative to the WM14. Pins that have the same functionality are excluded from the table below.

Pin	Dir.	WM14 Pin Designator	Min.	Typ.	Max.	WM14 Functionality	S7648 Pin Designator	Min.	Typ.	Max.	S7648 Functionality
5	Input	RESET_nIN	0V		1.8V	Reset signal for the Skywire. Tie low for 100 ms to reset.	RESET_nIN	0V		1.8V	Reset signal for the Skywire. Tie low for 20 ms to reset.
6	Input	VUSB	4.4V	5V	5V	Supply for USB interface.	VUSB	3.2V	5V	5V	Supply for USB interface.
9	Input	nWAKE_IN	0V		5.5V	<p>This pin controls the sleeping and waking of the Skywire.</p> <p>Driving this pin low signals to the Skywire that the microcontroller needs the modem, and prevents sleep mode.</p> <p>Driving this pin high signals to the modem that the microcontroller doesn't need the Skywire, allowing the modem to enter sleep mode.</p>	DTR			<p>VIL: GND to 0.15V</p> <p>VIH: VREF-0.4V to VREF</p>	<p>"Data terminal ready" pin.</p> <p>This pin is used to signal to the modem that the microcontroller is ready for a data transmission.</p> <p>Similar to the WM14, this pin is used to control the sleep mode functionality. This pin is driven low to keep the modem awake, and is driven high to allow the modem to sleep.</p>
13	Output	nWAKE_OUT	0V		VREF	<p>This pin is used to signal to the host microcontroller that the Skywire needs the host for a data transmission.</p> <p>When this pin is driven high, this indicates that the Skywire does not need the host, which allows the host to sleep.</p> <p>When this pin is driven low, this indicates that the Skywire needs the microcontroller's attention.</p>	VGPIO	0V		1.8V	<p>This pin is driven high whenever the modem is on and operational. Furthermore, this pin is also powered when the modem is idle or in sleep mode.</p> <p>A common use for this pin is use it to power external level shifters, or to interface with the Skywire's GPIO pins.</p>
17	I/O	GPIO2	0V		1.8V	Programmable GPIO pin.	DIO5	0V		1.8V	Programmable GPIO pin.
18	I/O	GPIO3	0V		1.8V	Programmable GPIO pin.	DIO7	0V		1.8V	Programmable GPIO pin.

Pin	Dir.	WM14 Pin Designator	Min.	Typ.	Max.	WM14 Functionality	S7648 Pin Designator	Min.	Typ.	Max.	S7648 Functionality
19	Input	ADC1	0V		1.8V	On-board ADC module input.		0V		1.2V	On-board ADC module input.
20	Input	ON_OFF	0V		VREF	Modem ON/OFF signal. Must be tied low at all times to keep the modem powered on.	PWR_ON	0V		1.8V	Modem ON/OFF signal. Tie low for at least 25 ms to initiate a power on sequence.

3.2 Antenna Changes

The orientation of the primary antenna connector, X1, and the diversity antenna connector, X2, is reversed on the S7648 relative to the WM14. On the WM14, X1 is the rightmost connector. Whereas, X1 is the leftmost connector on the S7648. Refer to the figures below for clarification:



In the figures above, note the difference in orientation of the two antenna connectors, X1 and X2. As mentioned above, the antenna connector orientation on the S7648 Skywire is reversed relative to that of the WM14.