Getting Started with 4G Modem Card
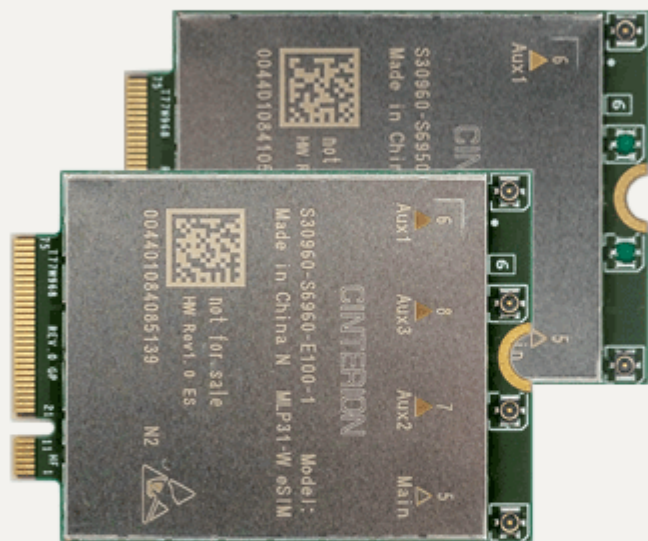
User Guide

Version: 01
DocId: MLx31_startup_guide_v01

User Guide:	**Getting Started with 4G Modem Card**
Version:	**01**
Date:	**2021-05-06**
DocId:	**MLx31_startup_guide_v01**
Status	**Confidential / Prelimenary**

Contents

0 Document History

New document: "Getting Started with 4G Modem Card" Version 01

Chapter	What is new
---	Initial document setup.

1 Introduction

This document describes a ready-to-use development and test environment for the Thales 4G Modem Card.

The development and test environment comprises the following hardware components
- 4G Modem Card MLA31-W or MLP31-W
- 4G Modem Card Adapter Board

The purpose of this document[1] is to guide you through the process of connecting the hardware, installing the supplied drivers on a Microsoft® Windows 10 system and getting started with 4G Modem Card.

1.1 Supported Products

This document applies to the following Thales 4G Modem cards:
- Cinterion® MLA31-W
- Cinterion® MLP31-W

4G Modem Card in this document refers to all of the above mentioned product variants. Where necessary a note is made to differentiate between these product variants.

1.2 Related Documents

[1] MLx31-W Hardware Interface Description

[1.] The document is effective only if listed in the appropriate Release Notes as part of the technical documentation delivered with your Thales module.

2   Getting Started with 4G Modem Cards

2.1   Technical Requirements

- MLx31-W (for details see Figure 1 and [1])[2]
- corresponding driver package (USB)
- Computer running Windows 10, USB 3.0 Interface
- Local administrator privileges on the particular Windows computer to install and uninstall the drivers
- 4G Modem Card Adapter Board USB Variant (for details see Section 3.1)
- Accessories for MLx31-W:
  - Two (MLA31-W) / four (MLP31-W) short 50 Ohms RF adapter cables with MHF4 type connectors to connect the appropriate MHF4 type connectors on the 4G Modem Card Adapter Board (supplied by Thales)
  - Two (MLA31-W) / four (MLP31-W) external 50 Ohms RF antennas with SMA connector to connect the SMA connector on the 4G Modem Card Adapter Board (supplied by Thales)
  - USB 3.0 cable (supplied by Thales)
- Appropriate application for controlling the module from within a PC's operating system. For Windows, e.g. Windows Hyperterminal
- (U)SIM from a UMTS/LTE network provider

2.2   Connecting MLx31-W to the 4G Modem Card Adapter Board

To properly connect the 4G Modem Card and all accessories to the 4G Modem Card Adapter Board please complete the steps listed below. The complete setup with the 4G Modem Card mounted onto the 4G Modem Card Adapter Board is shown in Figure 2.

- Ensure that all jumpers and switches on the 4G Modem Card Adapter Board are set to their positions as shown in Table 2 and Table 3.
- Place Thermo Pad with the self adhesive side (remove protection foil) on the 4G Modem Card Adapter Board between M.2 Connector and retention screw whole for 42mm cards.
- Insert the 4G Modem Card into the M.2 connector on the 4G Modem Card Adapter Board and insert the screw to keep the 4G Modem Card in position and connected.
- Connect the MHF4 type connectors for the antennas on the 4G Modem Card Adapter Board (**MLA31-W:** MAIN, AUX1; **MLP31-W:** MAIN, AUX1, AUX2, AUX3) to the matching MHF4 type connectors on the 4G Modem Card.
- Screw the external antennas to the appropriate SMA connectors on the 4G Modem Card Adapter Board (**MLA31-W:** MAIN, AUX1; **MLP31-W:** MAIN, AUX1, AUX2, AUX3).
- Insert the (U)SIM card into the card reader for 1st SIM.
- Plug the USB 3.0 USB cable to the USB jack at the 4G Modem Card Adapter Board.

After connecting the 4G Modem Card with the 4G Modem Card Adapter Board, the 4G Modem Card can be switched on by connecting the other end of the USB cable to the PC. The initial startup and USB driver installation are described in Section 2.3.

[2.] For ordering information see [1].
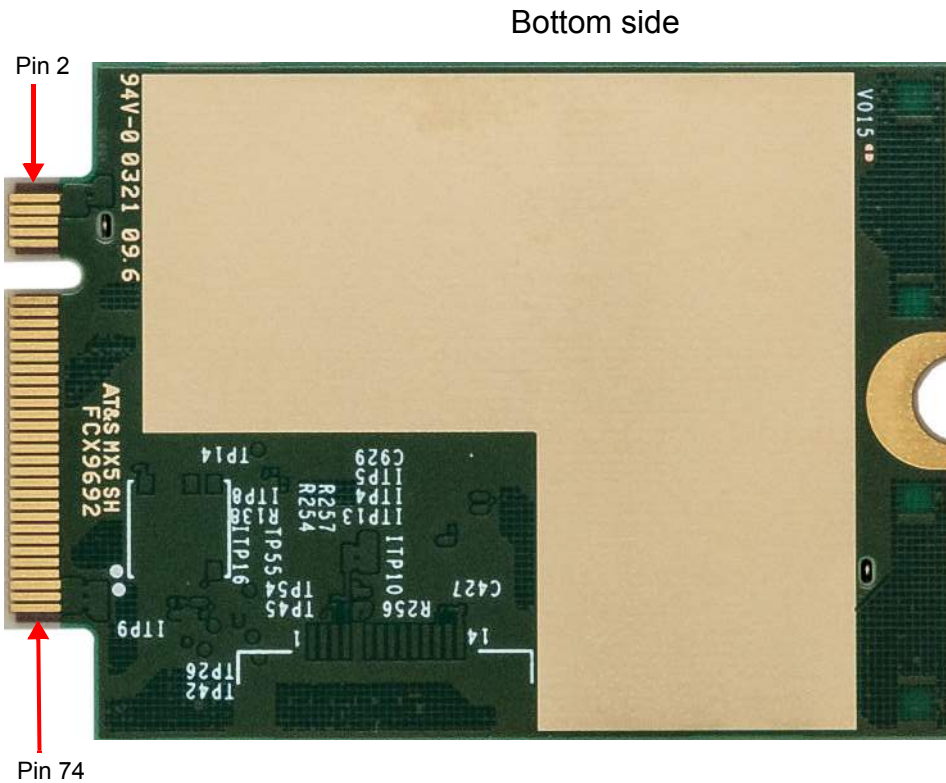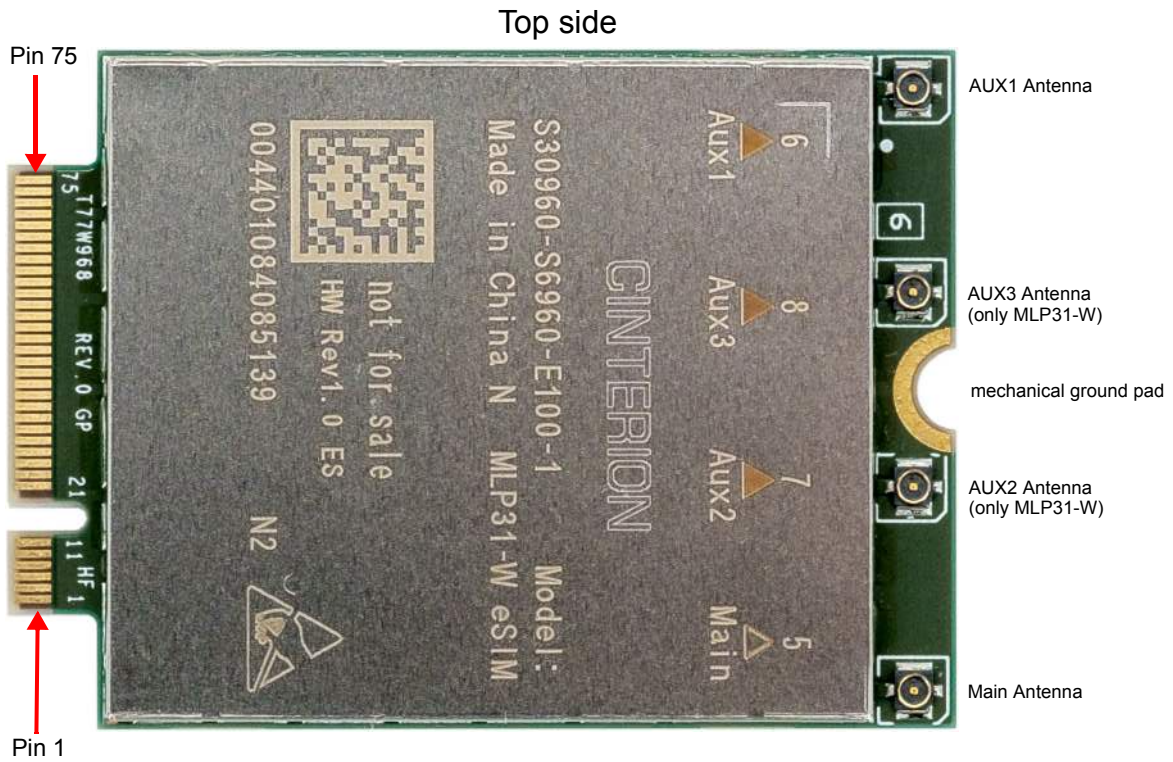
Top side

Pin 75

Aux1 — 6
Aux3 — 8
Aux2 — 7
Main — 5

S30960-S6960-E100-1 Model:
Made in China N MLP31-W eSIM

CINTERION

not for sale
HW Rev1.0 ES

0044010840085139

N2

75 T77W968 REV.0 GP 21 11 HF 1

Pin 1

AUX1 Antenna

AUX3 Antenna
(only MLP31-W)

mechanical ground pad

AUX2 Antenna
(only MLP31-W)

Main Antenna

Bottom side

Pin 2

94V-0 0321 09.6

V015

AT&S MX5 SH
FCX96692

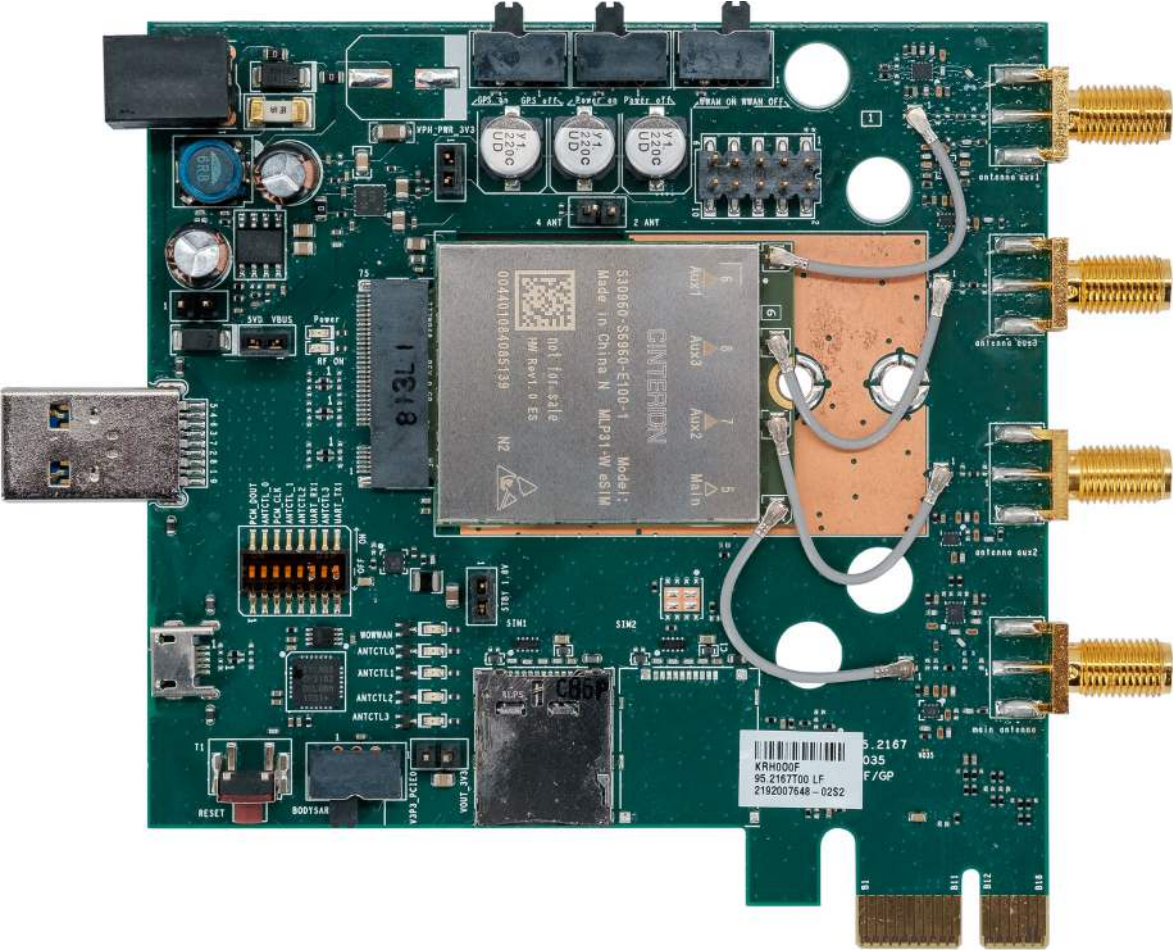Pin 74

Figure 1: 4G Modem Card

Figure 2: MLP31-W mounted on 4G Modem Card Adapter Board

2.3   Start Up the Modem Card

After connecting the 4G Modem Card to the 4G Modem Card Adapter Board as described in Section 2.2, the 4G Modem can be used.

Note: The driver package provided by Thales needs to be available. Extract and Copy the supplied driver files to a folder on the Windows computer. Be sure to use the latest driver software supplied by Thales.

2.3.1   Script based Driver Installation

The drivers can be installed by command. Therefore connect the Starter Kit with your PC first. When unpacking the driver package, don't use space character in the folder path.
Then run as "Administrator" the command "pnputil.exe /add-driver <path/inf-file> /install" for each inf-File in the sequence given in Table 1.
After running the commands the interfaces shown in Table 1 should be installed.

After successful driver installation the installed devices are listed in the Windows Device Manager (see Table 1).

Table 1: Installed Interfaces for USB

| Interface	Device Type	inf-File	Sequence
Generic Mobile Broadband Adapter	Network adapters	by Windows 10	
Cinterion PID 0x006D USB Modem	Modems	qcmdm.inf	3
Cinterion PID 0x006D USB Diagnostics (COM14)[1]	Ports (COM & LPT)	qcser.inf	
Cinterion PID 0x006D USB NMEA (COM15)[1]	Ports (COM & LPT)	qcser.inf	4 (last)
Cinterion PID 0x006D USB Application (COM16)[1]	Ports (COM & LPT)	qcser.inf	
Cinterion PID 0x006D USB GNSS QMUX	System devices	qmuxmdm.inf	1 (first)
Cinterion PID 0x006D USB GNSS	System devices	qcgnss.inf	2
ADB Interface	Universal Serial Bus Devices	by Windows 10	

[1.] COM Port number depends on the Host configuration

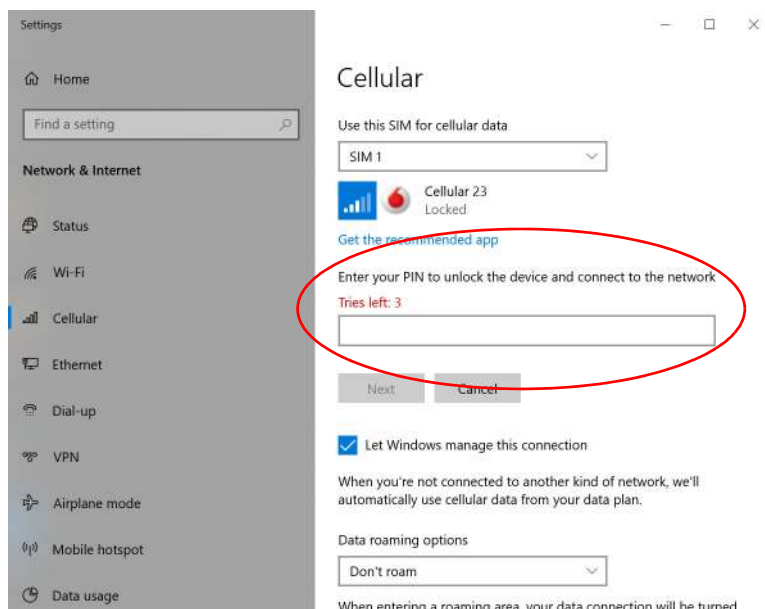## 2.3.2   Enter SIM and go Online

The following steps will show how to enter the SIM PIN for going Online with MLx31-W:

1. When the used SIM is locked by a PIN, Windows 10 will inform you, that the PIN is required. Click on this message or go to "Network Connections" (Click on "Start" with left mouse button and select "Network connection", "Cellular" (1) and then "Unlock SIM" (2).
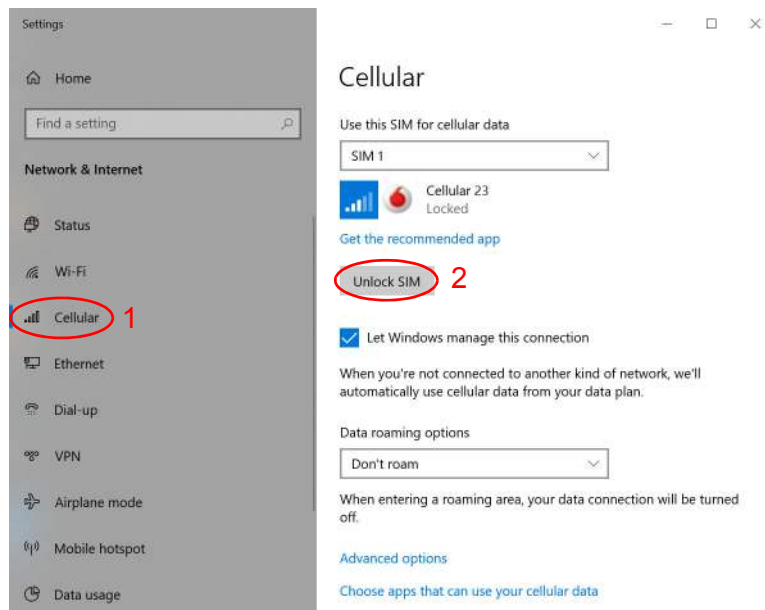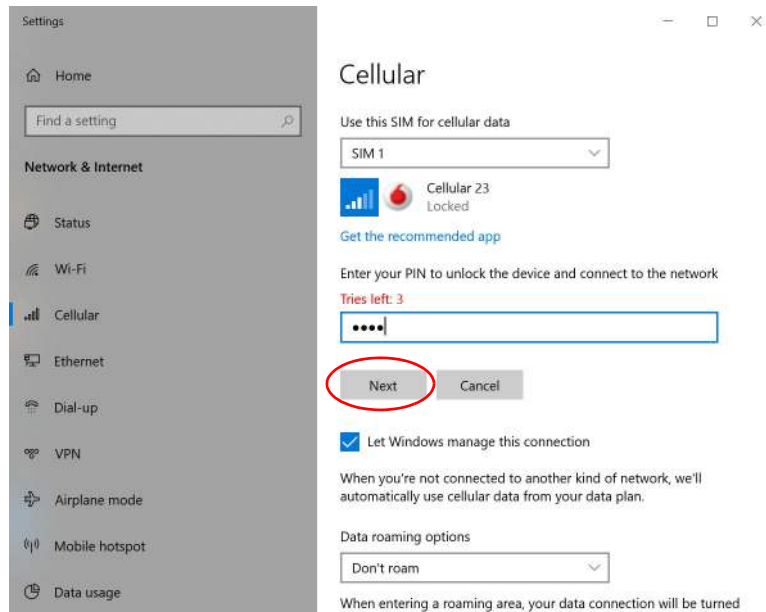

2. Enter your PIN

3. After entering the PIN press button "Next"

4. After successful registration to the network Windows 10 will show "Connected"
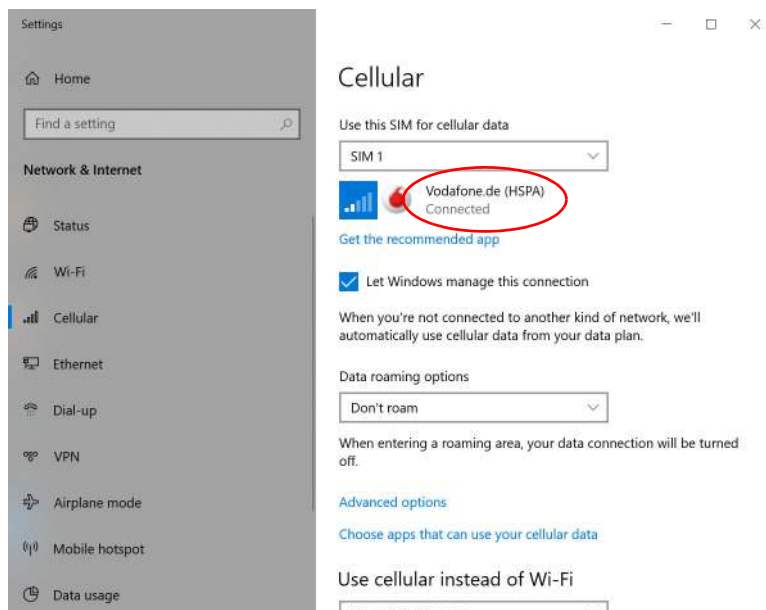
Now you can open a Internet Browser and go Online.

2.3.3   Reading MLx31-W Properties

To read the properties (Firmware version, IMEI, ...) of MLx31-W go to "Network Connections" (Click on "Start" with left mouse button and select "Network connection" and then, "Cellular" (1). Under "Advanced Option" (2) the firmware version of the MLx31-W will be shown.
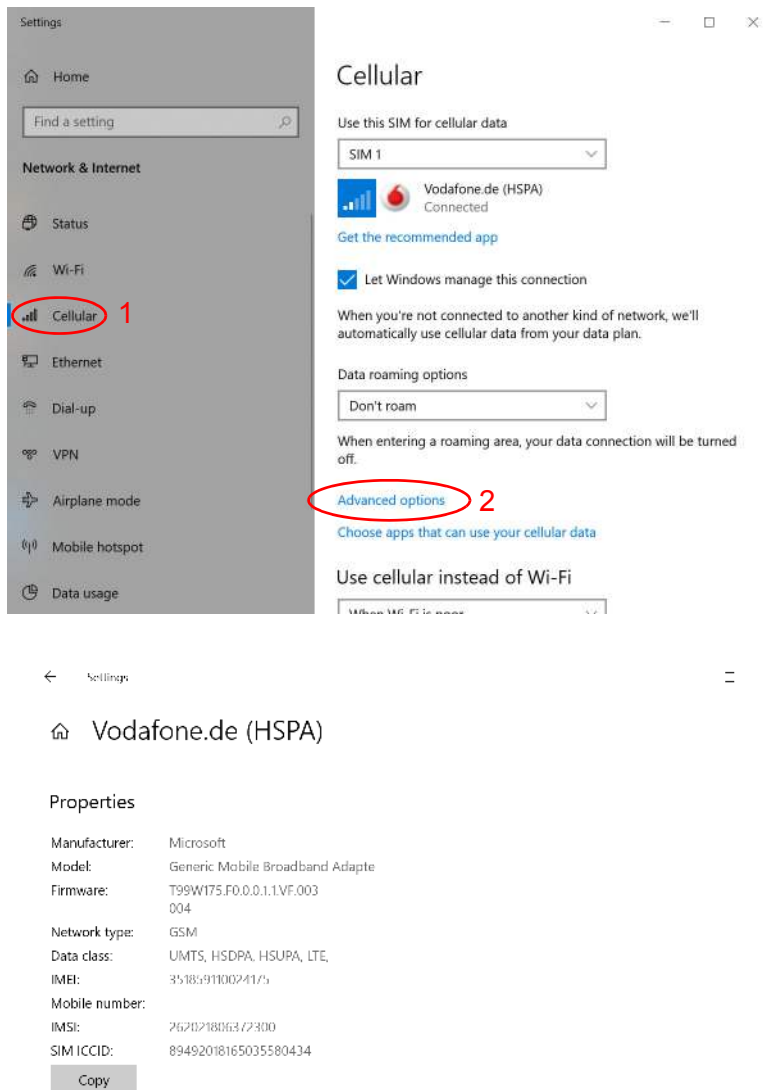
Additionally "Metered Connection", "APN settings" can be configured and the SIM PIN can be changed or removed too.

3   Appendix

3.1   4G Modem Card Adapter Board

3.1.1   Package Content

The 4G Modem Card Adapter Board (Figure 3 A) will be delivered together with

- 1 USB 3.0 cable (Figure 3 B)
- 1 USB cable with USB-C connector (Figure 3 C)
- 4 MHF4 type antenna cables (Figure 3 D)
- 4 UMTS/LTE/NR antennas (Figure 3 E)
- 1 Thermal Pad (Figure 3 F)
- 1 Screw to fix M.2 Card (Figure 3 G)
- 4 MHF4 to SMA antenna cables including washers and nuts (Figure 3 H)

GNSS Antenna and Power supply are not part of the 4G Modem Card Adapter Board delivery.
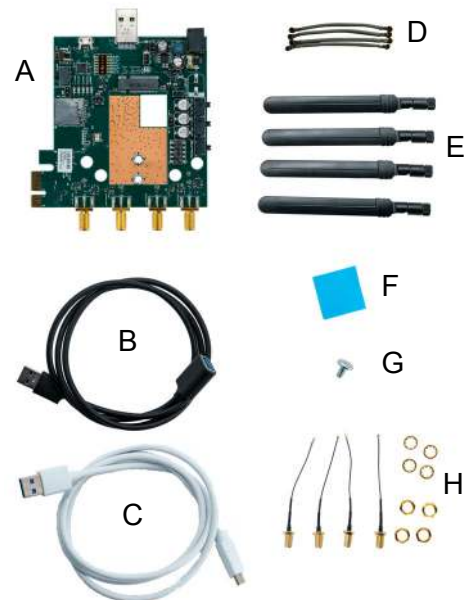
Ordering Number: L30960-N6951-A100

Figure 3: 4G Modem Card Adapter Board Kit
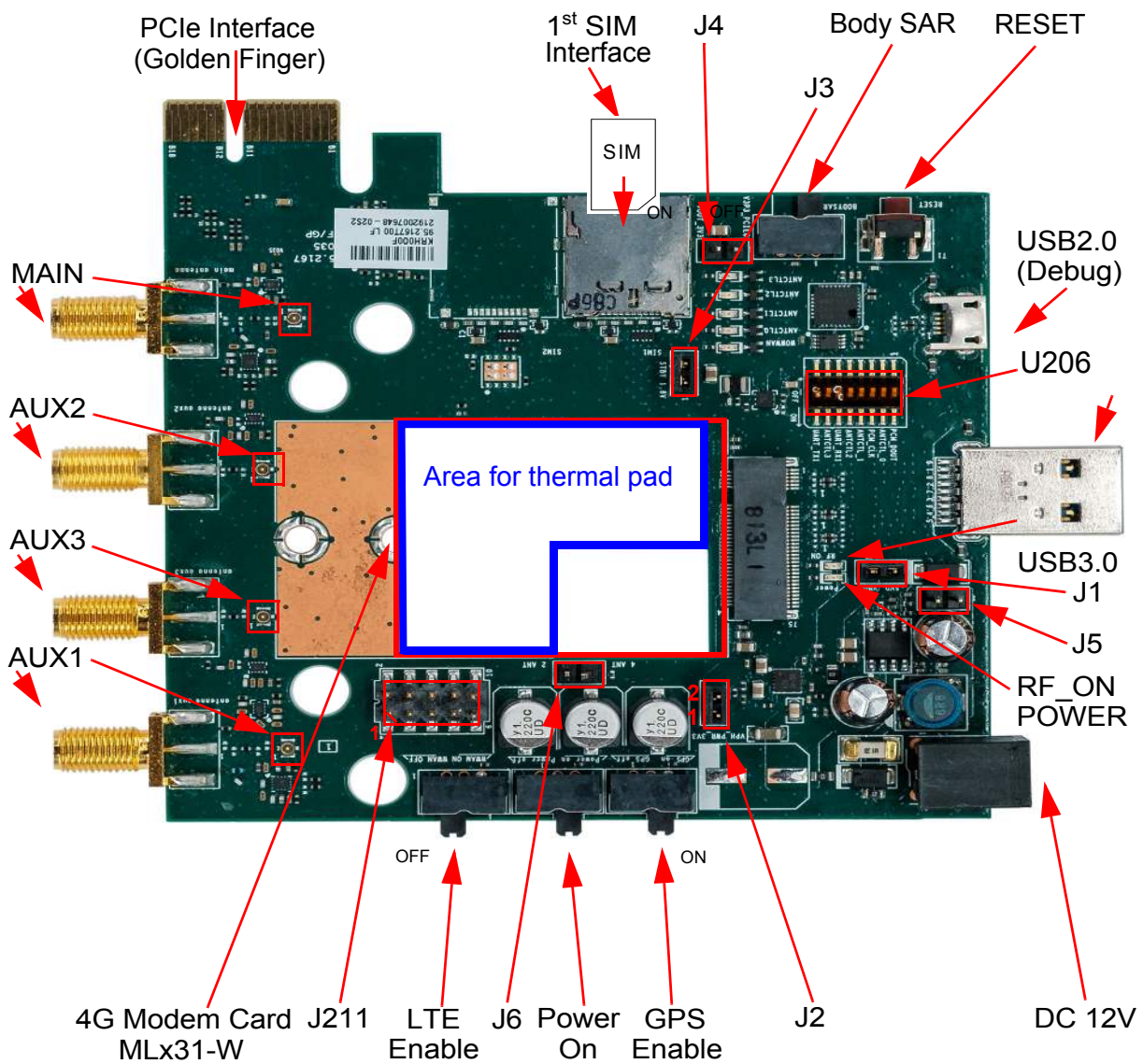
3.2 4G Modem Card Adapter Board Description

Figure 4: LTE Modem Card Adapter Board Jumper and Connectors

3.2.1 USB Variant

3.3 Power Supply Configuration

The 4G Modem Card Adapter Board can be powered over USB3.0, PCIe interface or by an external power supply. For configuration see Table 2

Table 2: Power Supply Configurations

		J1	J2	J3	J4	J5
1	Powered by USB3.0	mounted	mounted	mounted	removed	removed
2	Powered by PCIe Interface (Golden Finger)	removed	mounted	mounted	mounted	removed
3	Powered external 12V (see Figure 5)	removed	mounted	mounted	removed	mounted
4	Bypass 3.3V voltage regulator	removed	inject PIN1	mounted	removed	removed

For the position of the Jumpers see Figure 4.

To connect an external 12V DC power supply with the 4G Modem Card Adapter Board, the external power supply should have a co-axial power plug with 5.5 mm (0.22 in) in outside diameter and a pin sizes of 2.5 mm (0.098 in).
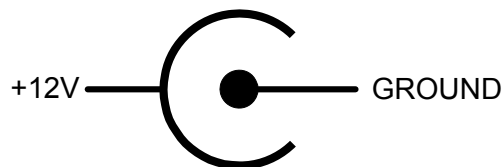

+12V ——— GROUND

Figure 5: Polarity of 12V DC Jack

3.4 Configuration Switches and Jumper

The following Table 3 show the recommended switch configuration.

Table 3: Switch Configuration U206

	1	2	3	4	5	6	7	8
Catch Logs	--[1]	--[1]	--[1]	--[1]	OFF	ON	OFF	ON
ANTCTL	OFF	ON	OFF	ON	ON	OFF	ON	OFF
PCM	ON	OFF	ON	OFF	--[2]	--[2]	--[2]	--[2]

[1] Switch 1-4 can have the setting for ANTCTL or PCM
[2] Switch 5-8 can have the setting for Catch Logs or ANTCTL

The Table 4 shows the detailed function of the required switches.

Table 4: Switch Configuration in detail

Switch Block	Switch	Function when ON	Delivery State
U206	1	PCM_DOUT	OFF
	2	ANTCTL_0	OFF
	3	PCM_CLK	OFF
	4	ANTCTL_1	OFF
	5	ANTCTL2	OFF
	6	UART_RX1	OFF
	7	ANTCTL3	OFF
	8	UART_TX1	OFF

For the position of the switches see Figure 4.

For MLP31-W only:
Jumper 6 selects between 4x4 MIMO and 2x2 MIMO.
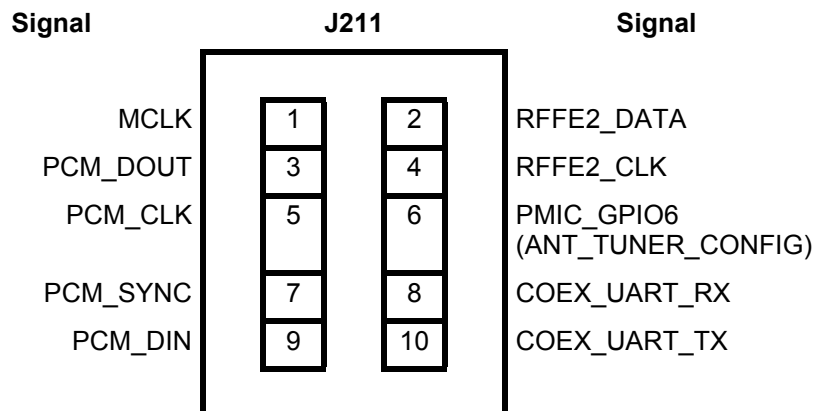
Table 5: Antenna configuration J6

J6	Description
mounted	4x4 MIMO antennas
unmounted	2x2 MIMO antennas

For the position of Jumper J6 see Figure 4.

3.5   Additional Connector

J211 (Table 6) provides additional signals, which are not available at the standard interfaces. For the position of J211 see Figure 4.

Table 6: Signals at Jumper on J211

Signal		J211		Signal
MCLK	1		2	RFFE2_DATA
PCM_DOUT	3		4	RFFE2_CLK
PCM_CLK	5		6	PMIC_GPIO6 (ANT_TUNER_CONFIG)
PCM_SYNC	7		8	COEX_UART_RX
PCM_DIN	9		10	COEX_UART_TX

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