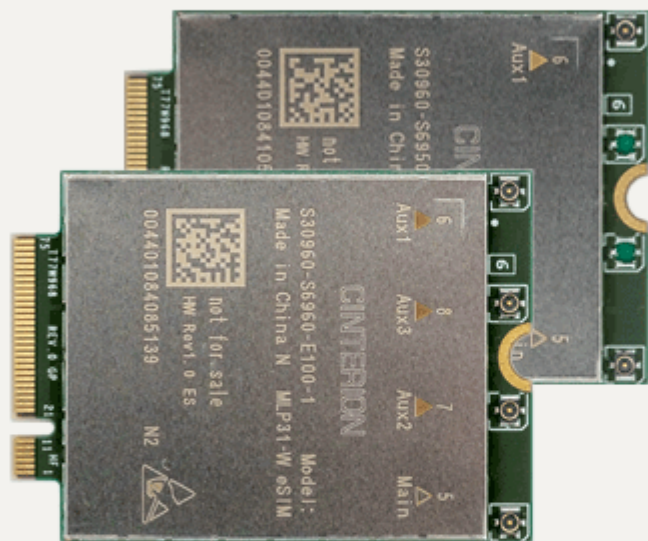


# Getting Started with 4G Modem Card

User Guide

Version: 01

DocId: MLx31\_startup\_guide\_v01



|             |   |
|-------------|---|
| User Guide: | <b>Getting Started with 4G Modem Card</b> |
| Version:    | <b>01</b>                                 |
| Date:       | <b>2021-05-06</b>                         |
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| Status      | <b>Confidential / Preliminary</b>         |

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# 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<sup>1</sup> 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

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<sup>1</sup> 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 [\[1\]](#))<sup>2</sup>
- 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 hole 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 1<sup>st</sup> 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](#).

---

<sup>2</sup> For ordering information see [\[1\]](#).

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

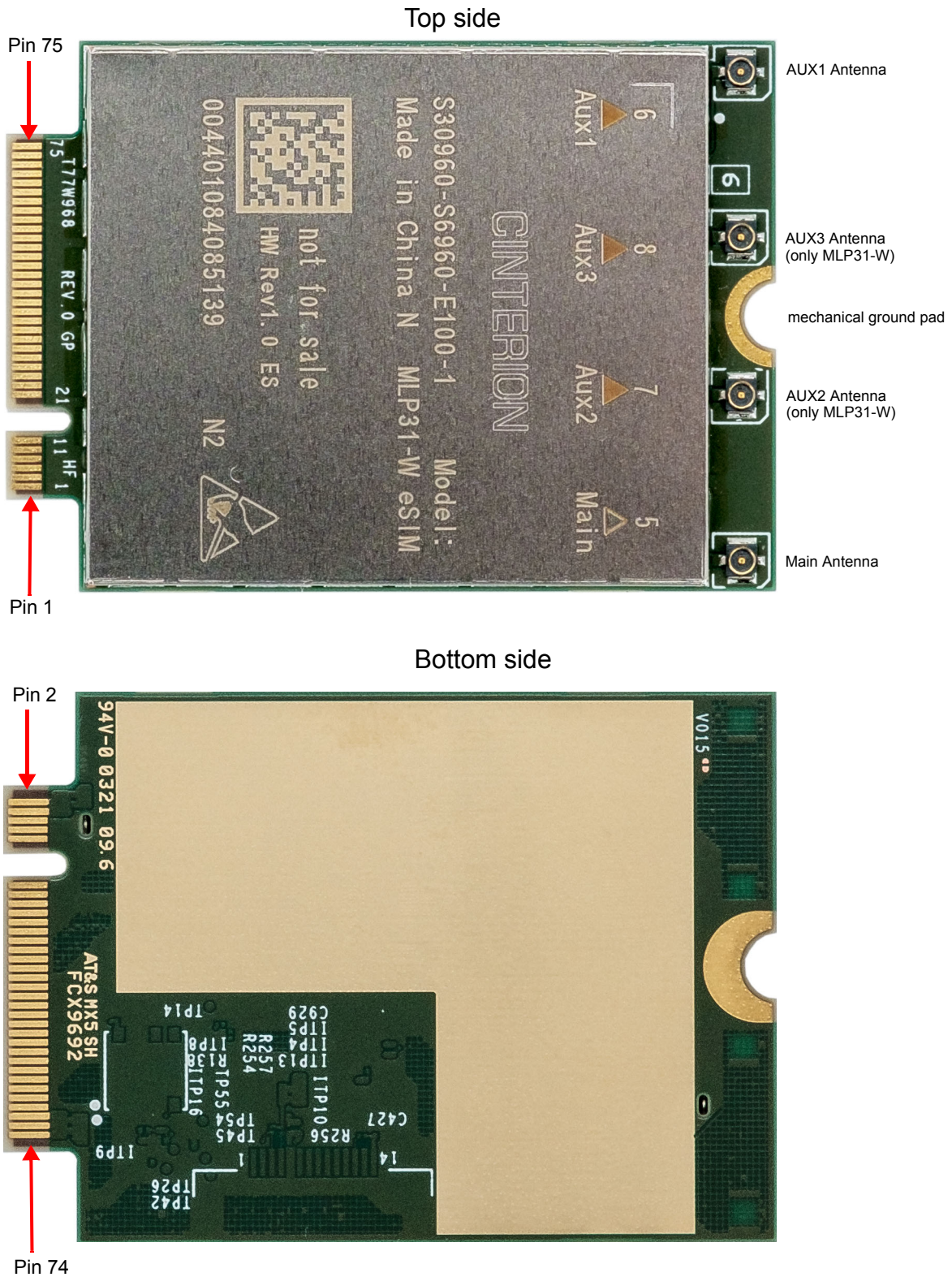


Figure 1: 4G Modem Card

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

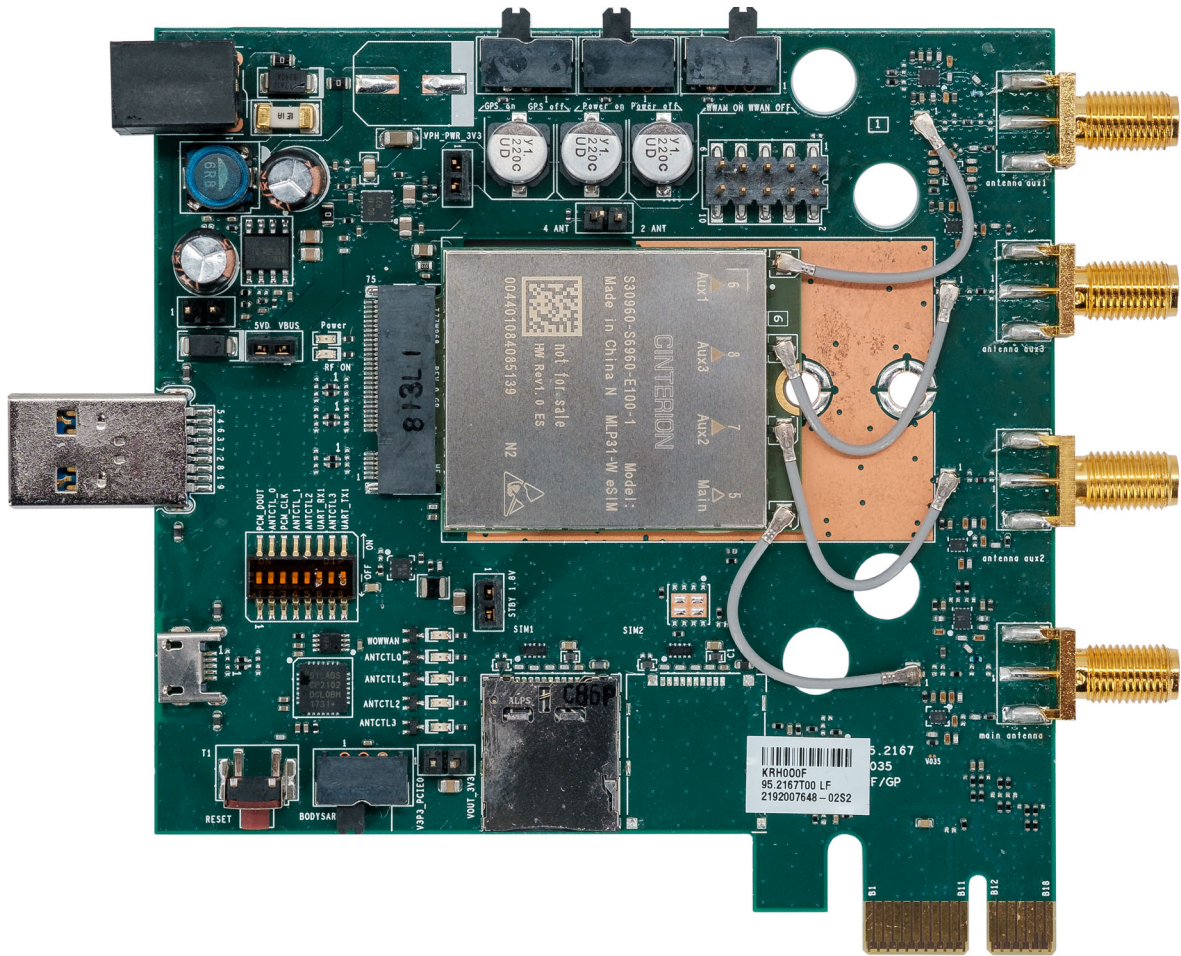


Figure 2: MLP31-W mounted on 4G Modem Card Adapter Board



## 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) <sup>1</sup> | Ports (COM & LPT)            | qcser.inf     | 4 (last)  |
| Cinterion PID 0x006D USB NMEA (COM15) <sup>1</sup>        | Ports (COM & LPT)            | qcser.inf     |           |
| Cinterion PID 0x006D USB Application (COM16) <sup>1</sup> | Ports (COM & LPT)            | qcser.inf     |           |
| Cinterion PID 0x006D USB GNSS QMUX                        | System devices               | qmuxmdm.inf   | 1 (first) |
| Cinterion PID 0x006D USB GNSS                             | System devices               | qcgss.inf     | 2         |
| ADB Interface   | Universal Serial Bus Devices | by Windows 10 |           |

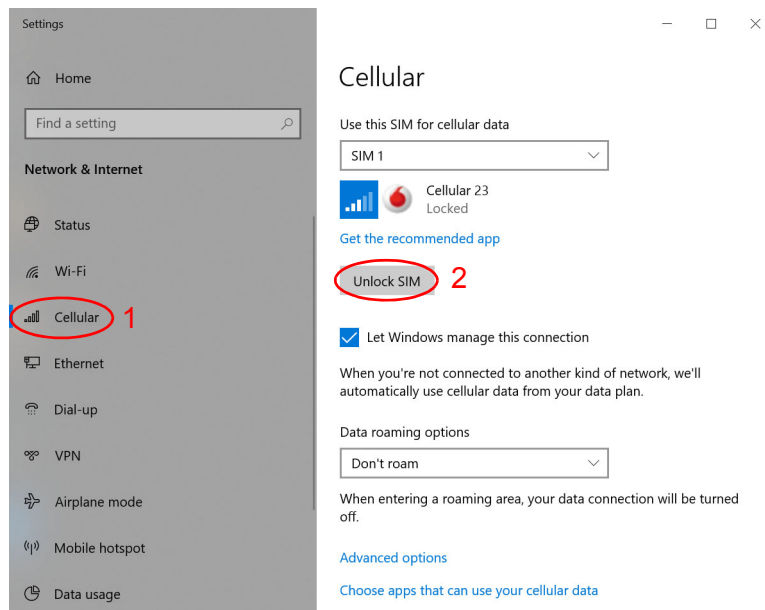
<sup>1</sup>. COM Port number depends on the Host configuration

2.3 Start Up the Modem Card

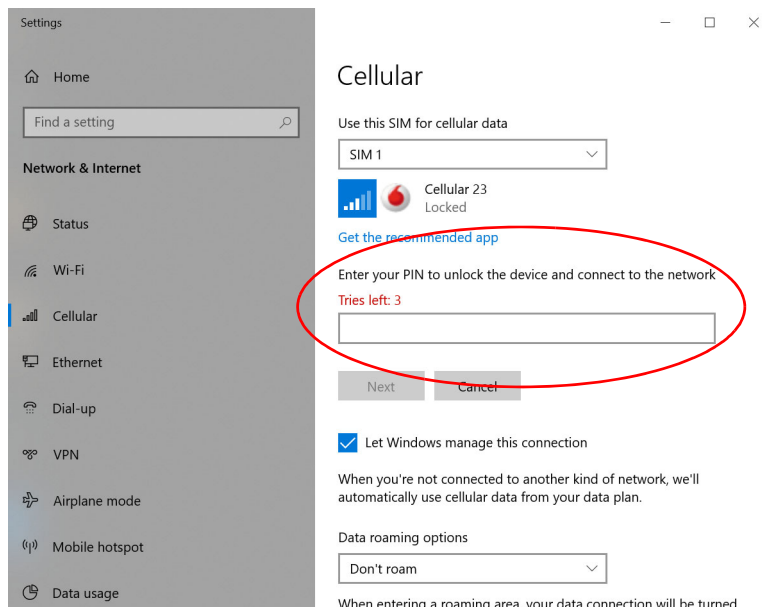
### 2.3.2 Enter SIM and go Online

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).

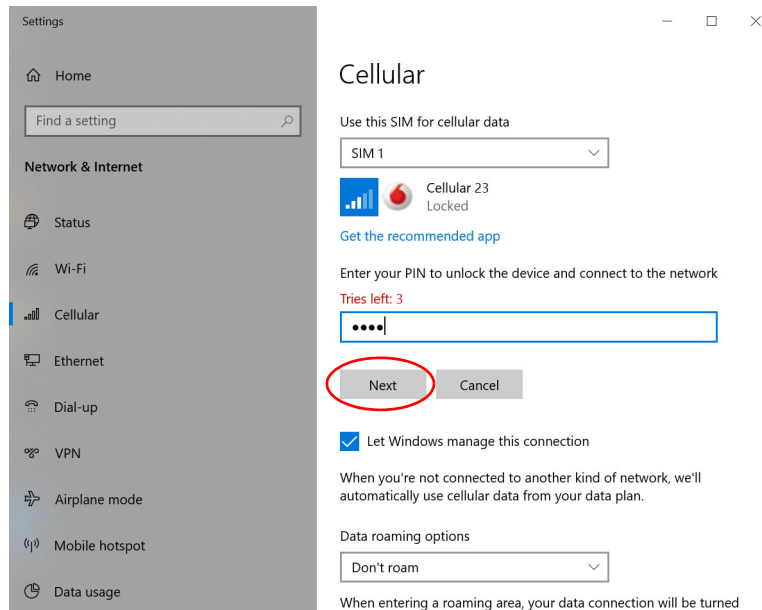


2. Enter your PIN

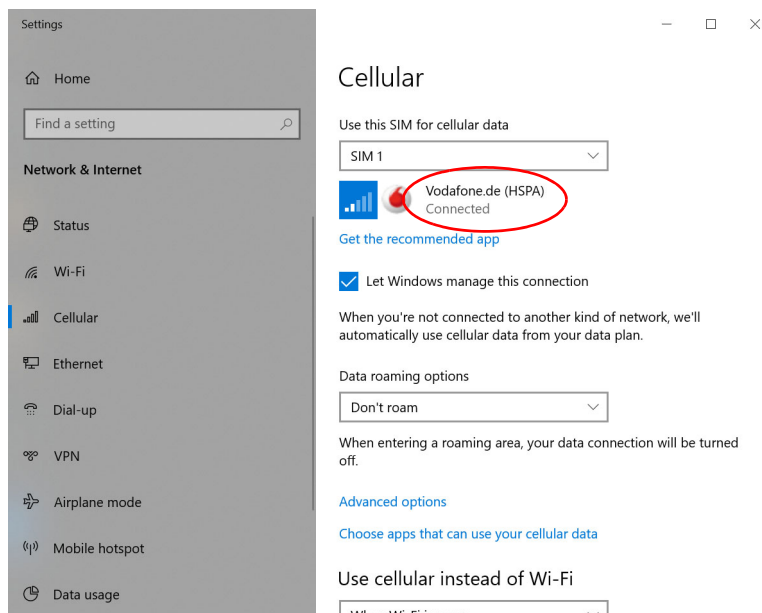


2.3 Start Up the Modem Card

3. After entering the PIN press button "Next"



4. After successful registration to the network Windows 10 will show "Connected"

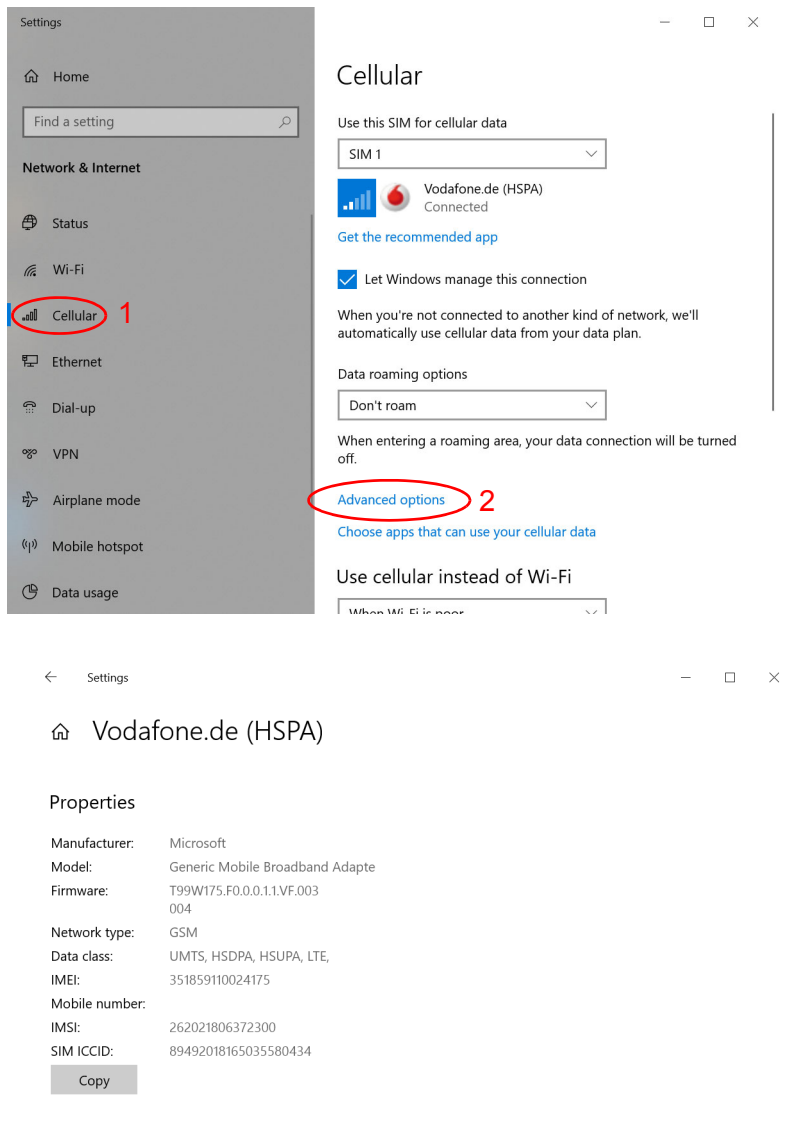


Now you can open a Internet Browser and go Online.

2.3 Start Up the Modem Card

### 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

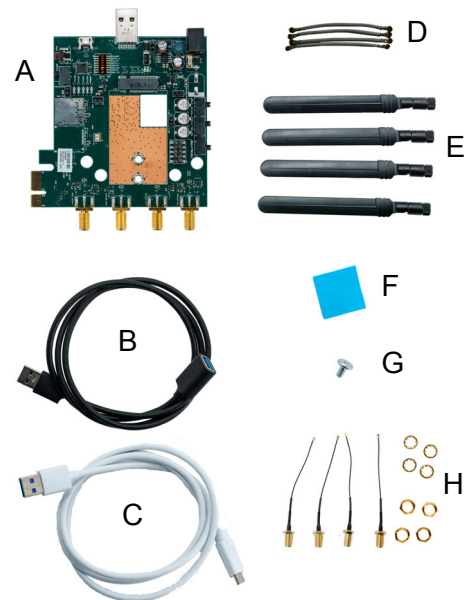


Figure 3: 4G Modem Card Adapter Board Kit

### 3.2 4G Modem Card Adapter Board Description

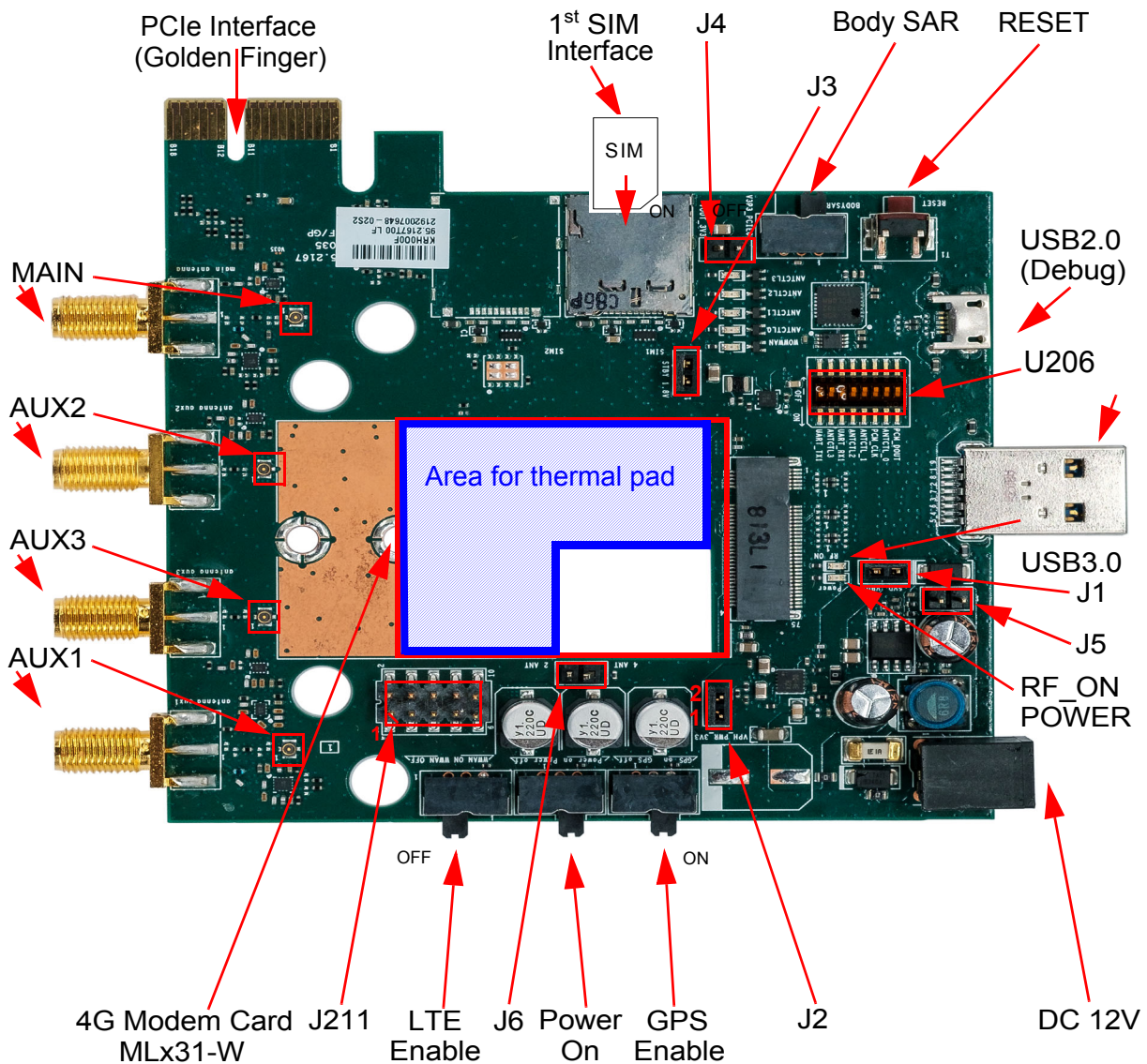


Figure 4: LTE Modem Card Adapter Board Jumper and Connectors

### 3.2.1 USB Variant

## 3.3 Power Supply Configuration

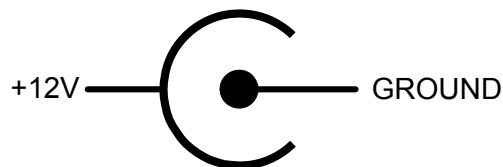
The 4G Modem Card Adapter Board can be powered over USB3.0, PCIe interface or by an external power supply. For configuration see [Table 2](#)

**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 <a href="#">Figure 5</a> ) | 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).



**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 | -- <sup>1</sup> | -- <sup>1</sup> | -- <sup>1</sup> | -- <sup>1</sup> | OFF             | ON              | OFF             | ON              |
| ANTCTL     | OFF             | ON              | OFF             | ON              | ON              | OFF             | ON              | OFF             |
| PCM        | ON              | OFF             | ON              | OFF             | -- <sup>2</sup> | -- <sup>2</sup> | -- <sup>2</sup> | -- <sup>2</sup> |

<sup>1</sup>. Switch 1-4 can have the setting for ANTCTL or PCM

<sup>2</sup>. Switch 5-8 can have the setting for Catch Logs or ANTCTL

The [Table 4](#) shows the detailed function of the required switches.

3.5 Additional Connector

**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

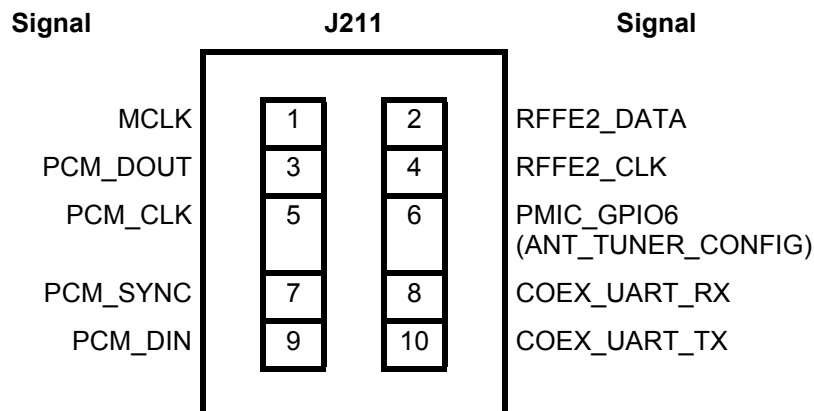
| J6        | Description       |
|-----------|-------------------|
| mounted   | 4x4 MIMO antennas |
| unmounted | 2x2 MIMO antennas |

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







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