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### Applicability Table

#### PRODUCTS

<table>
<thead>
<tr>
<th>Platform Version ID</th>
<th>Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>LE910 Cat1 SERIES</td>
<td>20</td>
</tr>
<tr>
<td>LE910 V2 SERIES</td>
<td>4G</td>
</tr>
</tbody>
</table>

1 Platform Version ID is a reference used in the document. It defines the different SW versions, e.g. 13 for SW version 13.xx.xxx, 20 for software version 20.xx.xxx, etc.
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1 INTRODUCTION

1.1 Scope
The present document provides a guideline to connect logically the physical serial ports of the module to the services supported by the module itself (GNSS, AppZone). It is up to the user to configure the module in suitable way to avoid hardware/software resources conflicts. With the generic "ports/services arrangement" expression is intended each possible set of logical connections regarding physical ports and Service Access Points supported by the used module (e.g. AT0, AT1, AT2, etc.).

1.2 Audience
This guide is addressed to the application developers that need to choose and configure the best logical connection to fulfill their project requirements.

1.3 Contact Information, Support
For general contact, technical support services, technical questions and report documentation errors contact Telit Technical Support at:

- TS-EMEA@telit.com
- TS-AMERICAS@telit.com
- TS-APAC@telit.com

Alternatively, use:
http://www.telit.com/support

For detailed information about where you can buy the Telit modules or for recommendations on accessories and components visit:
http://www.telit.com

Our aim is to make this guide as helpful as possible. Keep us informed of your comments and suggestions for improvements.
Telit appreciates feedback from the users of our information.
1.4 Text Conventions

**Danger** – This information MUST be followed or catastrophic equipment failure or bodily injury may occur.

---

**Caution or Warning** – Alerts the user to important points about integrating the module, if these points are not followed, the module and end user equipment may fail or malfunction.

---

**Tip or Information** – Provides advice and suggestions that may be useful when integrating the module.

---

All dates are in ISO 8601 format, i.e. YYYY-MM-DD.
1.5 Related Documents

2 VIRTUAL SERVICE DEVICE

Before describing the AT#PORTCFG command, it is useful introduce the Virtual Serial Device (VSD).

VSD is a software layer designed to run on Telit's modules. It manages logical connections between the physical serial ports, accessible to the user, and the services provided by the module. VSD supports a set of Service Access Points used as anchorage points for the internal logical connections. Here are the items involved in the configurations.

- **Physical Serial Ports:**
  - USIF0<br/>
  - USIF1<br/>
  - USB0 ÷ USB6, seven USB ports (or channels)

- **Services Access Points:**
  - AT0 (AT Parser Instance #1)<br/>
  - AT1 (AT Parser Instance #2)<br/>
  - AT2 (AT Parser Instance #3)<br/>
  - TT (used for Telit Trace)

- **CMUX Protocol**
  Used to create four virtual ports.

- **Services**
  - External GNSS Receiver
  - AppZone

Refering to Fig 1:
the modules provide three AT Commands Parser Instances, which are logically independent and connected to three different Service Access Points; each parser recognizes and executes the AT commands received on its Service Access Point.

Fig 1: AT Parser Instances

\footnote{in document [3], USIF0 and USIF1 are called respectively Modem Serial Port1 and Modem Serial Port 2.}
### 3 PRELIMINARY INFORMATION

It is strongly recommended to use the AT#USBCFG=? and AT#PORTSCFG=? Test commands to have information respectively on the USBx ports configuration modes and ports arrangements provided by the module that you are using. Refer to document [2] to have information on AT commands syntax.

### 3.1 USB Ports Configuration Modes

Assume that the module is using the factory-setting ports configuration, and the USB cable is connected to the PC, Fig 2 shows an example of USBx/COMx ports mapping. The mapping depends on the Windows-PC configuration, in this case USB0 port is mapped into COM17 port.

![USBx Ports Mapped into Virtual COMx Ports](image)

Tab 1 summarizes the mapping shown in Fig. 2.

<table>
<thead>
<tr>
<th>USBx Ports</th>
<th>COMx Ports</th>
</tr>
</thead>
<tbody>
<tr>
<td>USB0</td>
<td>COM17</td>
</tr>
<tr>
<td>USB1</td>
<td>COM12</td>
</tr>
<tr>
<td>USB2</td>
<td>COM13</td>
</tr>
<tr>
<td>USB3</td>
<td>COM16</td>
</tr>
<tr>
<td>USB4</td>
<td>COM14</td>
</tr>
<tr>
<td>USB5</td>
<td>COM15</td>
</tr>
</tbody>
</table>

Tab 1: Mapping Table
Enter the AT#USBCFG=? Test command to check the number of USB ports modes provided by the module.

AT#USBCFG=?
#USBCFG: (0-5) ← the module provides six modes
OK

Check the current mode
AT#USBCFG?
#USBCFG: 0 ← 0 is the factory-setting mode
OK

Change the mode, for example mode=5
AT#USBCFG=5
OK

Check the current mode
AT#USBCFG?
#USBCFG: 5 ← but, mode 5 is not still active
OK

To activate the new mode power off/on the module, or enter the AT#REBOOT command.

Tab 2 describes the USB0÷USB5 ports configuration for each mode.

<table>
<thead>
<tr>
<th>Mode</th>
<th>USB Port Configurations</th>
<th>Description</th>
<th>PID</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 (factory-setting)</td>
<td>ACM: ✅ SS: standard NCM: ✅</td>
<td>All USBx ports support ACM subclass, Selective Suspend standard type, and NCM protocol.</td>
<td>0x36</td>
</tr>
<tr>
<td>1</td>
<td>Data only ACM: ✅ SS: standard</td>
<td>All USBx ports support ACM subclass in Data only mode, and Selective Suspend standard type.</td>
<td>0x34</td>
</tr>
<tr>
<td>2</td>
<td>✅ standard</td>
<td>All USBx ports support ACM subclass, and Selective Suspend standard type.</td>
<td>0x35</td>
</tr>
<tr>
<td>3</td>
<td>✅ standard (✓)</td>
<td>All USBx ports provide ACM subclass, Selective Suspend standard type, and the following feature: USB device starts with MBIM protocol, the host may force the device to use the NCM protocol.</td>
<td>0x32</td>
</tr>
<tr>
<td>4</td>
<td>✅ custom</td>
<td>All USBx ports provide ACM subclass, Selective Suspend custom type, and NCM protocol.</td>
<td>0x37</td>
</tr>
<tr>
<td>5</td>
<td>✅ custom (✓)</td>
<td>All USBx ports provide ACM subclass, Selective Suspend custom type, and the following feature: USB device starts with MBIM protocol, the host may force the device to use the NCM protocol.</td>
<td>0x33</td>
</tr>
</tbody>
</table>

Tab 2: #USBCFG Mode
Tab 3 shows the #USBCFG modes supported by Windows and Ubuntu Operating Systems, see chapter 8.1. Telit provides the USB driver to install on the Windows-PC (DTE). With Ubuntu operating systems, the attached USB device works with in-box drivers. See chapter 8.2, and 8.2.1

<table>
<thead>
<tr>
<th>Mode</th>
<th>Telit Driver</th>
<th>Ubuntu</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>1</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>3</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>4</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

Tab 3: #USBCFG Modes & OS

3.2 Serial Ports & Service Access Points

Enter the AT#PORTCFG=? Test command to know at which Service Access Point a physical serial port is connected according to the Variant value. The command returns a short description on the logical connection for each Variant value provided by the module.

**AT#PORTCFG=?**

| #PORTCFG: Variant=0: AT= USIF0 USB0 USB3; STT (Trace) = USB1  |
| #PORTCFG: Variant=1: not supported by this product  |
| #PORTCFG: Variant=2: not supported by this product  |
| #PORTCFG: Variant=3: AT= USIF0 USIF1 USB0; STT(Trace) = USB1  |
| #PORTCFG: Variant=4: not supported by this product  |
| #PORTCFG: Variant=5: not supported by this product  |
| #PORTCFG: Variant=6: not supported by this product  |
| #PORTCFG: Variant=7: not supported by this product  |
| #PORTCFG: Variant=8: AT= USB0 USB3 USB4; STT(Trace) = USB1  |
| #PORTCFG: Variant=9: not supported by this product  |
| #PORTCFG: Variant=10: not supported by this product  |
| #PORTCFG: Variant=11: AT= USIF0 USB3 USB0; STT(Trace)= USB1; ExtGNSS= USIF1 OK  |

STT is used interchangeably with TTC (Telit Trace Client tool).
Here is the message meaning for each Variant value:

Variant=0:
- USIF0, USB0, and USB3 are connected to AT parser 0, 1, 2. They are not specified in the message. USB1 is connected to the TT Service Access Point.

Variant=8:
- USB0, USB3, USB4 are connected to AT parser 0, 1, 2. They are not specified in the message. USB1 is connected to the TT Service Access Point.

Variant=...
- And so on for each supported Variant value.

The ports arrangement that you set, can be used with one of the six #USBCFG modes:

- #PORTCFG assigns a Service Access Point to one or more USBx port,
- #USBCFG assigns a "mode" to all USBx ports. Each mode defines a product (USB device) by means of the PID, each product provides different features described in Error! Reference source not found.
4 AT#PORTCFG COMMAND

The AT#PORTCFG command manages several internal ports arrangements by means of its parameter value called "Variant", refer to document [2]. The tables and figures illustrated on the next pages show the various ports configurations obtained changing the "Variant" value of the command and plugging in/unplugging the USB cable. Follow this sequence to make active the entered AT#PORTCFG command.

- Start from the configuration shown in Tab 4, it is the factory-setting: #PORTCFG=0;
- Enter, for example, the AT#PORTCFG=3 command through USIF0 port, AT0 parser recognizes the just entered command, but no actions are taken;
- Power down the module;
- Power on the module. The AT#PORTCFG=3 command is executed and the ports/services arrangement of Tab 6 is set. To power off/on the module, you can use the AT#REBOOT command.

⚠️ The USBx port configuration depends on the mode set by means of the AT#USBCFG command. See Tab 2.

⚠️ The following tables show where to connect the trace tools. To have more information contact Telit Technical Support.
4.1 AT#PORTCFG=0

Tab 4: #PORTCFG=0, no USB Cable

Tab 5: #PORTCFG=0, with USB Cable

Fig 3: #PORTCFG=0 + USB Cable
4.2 AT#PORTCFG=3

<table>
<thead>
<tr>
<th>AT#PORTCFG=3</th>
<th>AT#PORTCFG=3</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT0 AT1 AT2 TT</td>
<td>AT0 AT1 AT2 TT</td>
</tr>
<tr>
<td>No USB cable</td>
<td>No USB cable</td>
</tr>
<tr>
<td>USIF0 USIF1</td>
<td>USIF0 USIF1</td>
</tr>
<tr>
<td>X X</td>
<td>X X</td>
</tr>
</tbody>
</table>

Tab 6: #PORTCFG=3, no USB Cable

<table>
<thead>
<tr>
<th>AT#PORTCFG=3</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT0 AT1 AT2 TT</td>
</tr>
<tr>
<td>USB0 X</td>
</tr>
<tr>
<td>USB1 TTC(Trace)</td>
</tr>
<tr>
<td>USB2 NA</td>
</tr>
<tr>
<td>USB3</td>
</tr>
<tr>
<td>USB4</td>
</tr>
<tr>
<td>USB5</td>
</tr>
<tr>
<td>USB6</td>
</tr>
<tr>
<td>USIF0 X</td>
</tr>
<tr>
<td>USIF1 X</td>
</tr>
</tbody>
</table>

Tab 7: #PORTCFG=3, with USB Cable

Fig 4: #PORTCFG=3 + USB Cable
4.3 AT#PORTCFG=8

Tab 8: #PORTCFG=8, no USB Cable

<table>
<thead>
<tr>
<th>AT#PORTCFG=8</th>
<th>AT0</th>
<th>AT1</th>
<th>AT2</th>
<th>TT</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO USB cable</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USIF0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USIF1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Tab 9: #PORTCFG=8, with USB Cable

<table>
<thead>
<tr>
<th>AT#PORTCFG=8</th>
<th>AT0</th>
<th>AT1</th>
<th>AT2</th>
<th>TT</th>
</tr>
</thead>
<tbody>
<tr>
<td>USB0</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USB1</td>
<td></td>
<td>TFC (Trace)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>USB2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USB3</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USB4</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>USB5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USB6</td>
<td>NA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USIF0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USIF1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Fig 5: #PORTCFG=8 USB Cable Only
4.4 AT#PORTCFG=11

AT#PORTCFG=11 is used to connect the module to an external GNSS receiver through USIF1 serial port, see chapter 6.1.

Tab 10: #PORTCFG=11, no USB Cable

Tab 11: #PORTCFG=11, with USB Cable

Fig 6: #PORTCFG=11 + USB Cable
5 CMUX PROTOCOL

This section describes examples of ports/services arrangement using CMUX protocol. If you need to develop a Multiplexing Protocol running on your application processor (for example a user micro-controller), refer to document [1] to get detailed information.

5.1 CMUX Protocol on USIF0 Port

Here is an example of ports/services arrangement based on CMUX protocol running on USIF0 serial port.

Assume that the module is configured as indicated in Tab 4: #PORTCFG=0 (factory-setting), and no USB cable plugged in. In addition, suppose that the used DTE is a Windows-PC, and Fig 7 shows its device configuration. Now, run on the DTE the Telit Serial Port MUX application configured as shown in Fig 8, and connect the MUX application to COM1 port, refer to Fig 9. When the user starts an application (for example Hyper Terminal) connected to one of the three Virtual Ports (COM20 ÷ COM22), Telit Serial Port MUX application sends automatically the AT+CMUX=0 command to the module and the CMUX protocol is activated.

![Fig 7: Physical COMx Ports](image1)

![Fig 8: Virtual Serial Ports of MUX](image2)
The configuration of the Telit Serial Port MUX application must avoid virtual serial ports conflict with the physical or virtual serial ports already present on the Windows-PC. The table below summarizes the new configuration.

<table>
<thead>
<tr>
<th>Module &lt;-&gt; DTE connection</th>
<th>COMx &lt;-&gt; VCx</th>
<th>AT0</th>
<th>AT1</th>
<th>AT2</th>
<th>TT</th>
</tr>
</thead>
<tbody>
<tr>
<td>USB not used</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USIF0 &lt;-&gt; COM1</td>
<td>COM20 &lt;-&gt; VC1</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>COM21 &lt;-&gt; VC2</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>COM22 &lt;-&gt; VC3</td>
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<td></td>
<td>X</td>
<td></td>
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<tr>
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<td>COM23 &lt;-&gt; VC4</td>
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</tbody>
</table>

Tab 12: Ports/Services Arrangement with CMUX Connected to USIF0

Fig 9: CMUX Connected to USIF0
5.2 CMUX Protocol on USB3 Port

Here is an example of ports/services arrangement based on CMUX protocol running on USB3 port.

Assume that the module is configured as indicated in Fig 3: #PORTCFG=0 (factory-setting), and USB cable plugged in. In addition, suppose that the used DTE is a Windows-PC, and Fig 2 shows its device configuration. Now, run on the DTE the Telit Serial Port MUX application configured as shown in Fig 10, and connect the MUX application to USB3 port mapped into COM16 virtual port, refer to Fig 11. When the user starts an application (for example Hyper Terminal) connected to one of the three Virtual Ports (COM20 ÷ COM22), Telit Serial Port MUX application sends automatically the AT+CMUX=0 command to the module and the CMUX protocol is activated.

In the current Windows-PC configuration the USB0 port is mapped into COM17 port, refer to Fig 10.

---

![Virtual Serial Ports of Telit Serial Port MUX](image)

**Fig 10: Virtual Serial Ports of Telit Serial Port MUX**
The table below summarizes the new configuration.

<table>
<thead>
<tr>
<th>Module &lt;-&gt; DTE connection</th>
<th>USB Ports</th>
<th>USBx → COMx</th>
<th>COMx → VCx</th>
<th>AT0</th>
<th>AT1</th>
<th>AT2</th>
<th>TT</th>
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<td></td>
<td></td>
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</tbody>
</table>

Tab 13: Ports/Services Arrangement with CMUX Connected to USB3 Port

**NOTICE:** AT0 (instance # 1) is disconnected from USIF0 and connected to VC1/USB3/COM16/COM20. The TTC tool is connected to USB1 port.

**Fig 11:** CMUX Connected to USB3 Port
6 SERVICES

The modules series covered by the present document provide the services indicated in the following table.

(*): AppZone available on demand on specific part numbers.

<table>
<thead>
<tr>
<th>Services</th>
<th>External GNSS</th>
<th>AppZone</th>
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</thead>
<tbody>
<tr>
<td>LE910 V2 Series</td>
<td>✔️</td>
<td>✔️</td>
</tr>
</tbody>
</table>

Tab 14: Services Table

As stated in the chapter 2, different Service Access Points connect the services to the Virtual Serial Device software layer. This section describes how the user can access the supported service by means of the external physical serial ports, which in their turn are connected to the VSD layer.

6.1 External GNSS Receiver

The external GNSS receiver is connected to the module through USIF1 serial port.

6.1.1 AT#PORTCFG=11

Tab 10 shows the starting port configuration of the module: #PORTCFG=11. Now, enable GPS/NMEA sentences through AT$GPSP=1 and AT$GPSMUN=1... commands entered on USIF0 port. AT0 parser executes the AT commands, and after that NMEA sentences and AT commands run across USIF0 port as shown in Fig 12.

Fig 12: USIF0 Port Support AT Commands + NMEA Sentences (External GNSS)
6.1.2 AT#PORTCFG=11 + USB

Tab 11 shows the starting port configuration of the module: #PORTCFG=11+USB. Now, enable GPS/NMEA sentences through AT$GPSP=1 and AT$GPSNMUN=1… commands entered, for example, on USB0 port. AT1 parser executes the AT commands, and after that NMEA sentences and AT commands run across USB0 port as shown in Fig 13.

**NOTICE:** the user can issue the AT commands through USIF0/AT0, USB0/AT1, or USB3/AT2 port/parser. The NMEA sentences are routed respectively on USIF0, USB0 (as shown by the example), or USB3 port.

---

**Fig 13:** USB0 Port Supports AT Commands + NMEA Sentences (External GNSS)
6.2 AppZone

Refer to documents [5], and [6] to have information on the AppZone layer and its functions (APIs).

6.2.1 USIFx Ports

**Example 1**

Tab 4 shows the starting ports configuration of the module: #PORTCFG=0 (factory-setting), no USB cable is connected. For example, run a user AppZone Application that does not use neither serial ports nor any ATx parsers; Fig. 14 shows the resulting ports arrangement.
Example 2

Starting from the configuration of the Example 1, use `m2m_os_iat_set_at_command_instance(...)` function to connect logically the AZ1 and AZ2 Service Access Points respectively to AT1 and AT2 parsers, in addition use `PrintToUart(...)` function to use USIF0 port. The figure below shows the resulting ports configuration.

Fig 15: AppZone Application Connected to AT1, AT2 Parsers, and USIF0 Serial Port
Example 3

Starting from the configuration of the Example 1, use

```
m2m_hw_uart_ioctl (uart_fd, M2M_HW_UART_IO_AT_MODE_SET, M2M_HW_UART_IO_AT_MODE_ON)
```

API to route data, received from USIF0, to AT1 parser. Fig. 16 shows the resulting ports configuration.

![Diagram showing data flow from USIF0 to AT1 parser through AppZone Layer](image)

**Fig 16: USIF0 Connected to AT1 Parser through AppZone Layer**
6.2.2 USBx Ports

Example 1

Tab 5 shows the starting ports configuration of the module: #PORTCFG=0 (factory-setting) with USB cable. Out of the six USB ports, only two ports are available for the user AppZone applications: USB0, and USB3.

Use `m2m_hw_usb_open(USB_CH0, handle0)` to disconnect USB0 port from AT1 parser, connect it to AppZone layer, and get its handle. When you use `USB_CH0`, the API tries to open the USB0 port, and returns the related handle.

Use `m2m_hw_usb_open(USB_CH3, handle3)` to disconnect USB3 port from AT2 parser, connect it to AppZone layer, and get its handle. When you use `USB_CH3`, the API tries to open the USB3 port, and returns the related handle.

The figure below shows the new configuration.

Fig 17: USB0 and USB3 Ports Available to AppZone Application
Example 2

Tab 9 shows the starting ports configuration of the module: #PORTCFG=8, with USB cable. Out of the six USB ports, only three ports are available for the user AppZone applications: USB0, USB3, and USB4. USB1 is reserved for TTC.

Use `m2m_hw_usb_open(USB_CH0, handle0)` to disconnect USB0 port from AT0 parser, connect it to AppZone layer, and get its handle. When you use `USB_CH0`, the API tries to open the USB0 port, and returns the related handle.

Use `m2m_hw_usb_open(USB_CH3, handle3)` to disconnect USB3 port from AT1 parser, connect it to AppZone layer, and get its handle. When you use `USB_CH3`, the API tries to open the USB3 port, and returns the related handle.

Use `m2m_hw_usb_open(USB_CH4, handle4)` to disconnect USB4 port from AT2 parser, connect it to AppZone layer, and get its handle. When you use `USB_CH4`, the API tries to open the USB4 port, and returns the related handle.

The figure below shows the new configuration.

![Diagram showing new USB configuration](image-url)
Example 3

Tab 9 shows the starting ports configuration of the module: #PORTCFG=8, with USB cable.

Use:

\texttt{m2m\_hw\_usb\_ioctl(handle4, M2M\_USB\_AT\_MODE\_SET, M2M\_HW\_USB\_IO\_AT\_MODE\_ON)}

API to route data received from USB4 port to AT1 parser.

The figure below shows the new configuration.

Fig 19: USB4 Port connected to AT1
## Glossary and Acronyms

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACM</td>
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<td>VSD</td>
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</table>
8 APPENDIXES

8.1 #USBCFG Modes

If you are using a Windows-PC, before plugging in the USB cable, and issuing the AT commands described in the following chapters, install the USB driver provided by Telit, see chapter 8.2.

8.1.1 #USBCFG=0

Set USB mode 0 (factory-setting).

AT#USBCFG=0
OK

Activate the just set mode

AT#REBOOT
OK

Fig 20: #USBCFG=0
If the device driver is not installed, and you plug in the USB cable, the “Device Manager” displays the folder “Other devices”. See the figure on the right, and compare it with the Tab 2: #USBCFG Mode.

8.1.1.1 Ubuntu

The figure shows the message returned by the dmesg command when you plug in the USB cable. This OS uses the in-box driver, see Telit idVendor=1bc7, and idProduct=0036 (#USBCFG=0).

---

**Fig 21: #USBCFG=0, Ubuntu**
8.1.2 #USBCFG=1

#USBCFG=1 mode in progress.

Set USB mode 1.
AT#USBCFG=1
OK

Activate the just set mode
AT#REBOOT
OK

8.1.3 #USBCFG=2

Set USB mode 2.
AT#USBCFG=2
OK

Activate the just set mode
AT#REBOOT
OK

Fig 22: #USBCFG=2
If the device driver is not installed, and you plug in the USB cable, the "Device Manager" displays the folder "Other devices". See the figure on the right, and compare it with the Tab 2: #USBCFG Mode.

8.1.3.1 Ubuntu

The figure shows the message returned by the dmesg command when you plug in the USB cable. This OS uses the in-box driver, see Telit idVendor=1bc7, and idProduct=0035 (#USBCFG=2).

Fig 23: #USBCFG=2, Ubuntu
8.1.4 #USBCFG=3

Set USB mode 3.

AT#USBCFG=3
OK

Activate the just set mode

AT#REBOOT
OK

Fig 24: #USBCFG=3
If the device driver is not installed, and you plug in the USB cable, the “Device Manager” displays the folder “Other devices”. See the figure on the right, and compare it with the Tab 2: #USBCFG Mode.

8.1.4.1 Ubuntu

Fig. 25 shows the message returned by the dmesg command when you plug in the USB cable. This OS uses the in-box driver, see Telit idVendor=1bc7, and idProduct=0032 (#USBCFG=3).

```
usb 1-3: New USB device found, idVendor=1bc7, idProduct=0032
usb 1-3: New USB device strings: Mfr=1, Product=2, SerialNumber=3
usb 1-3: Product: FRR7100
usb 1-3: Manufacturer: Telit
usb 1-3: SerialNumber: 353e22079900182
cdc_acm 1-3:1.0: This device cannot do calls on its own. It is not a modem.
cdc_acm 1-3:1.0: ttyACM8: USB AON device
cdc_acm 1-3:1.2: This device cannot do calls on its own. It is not a modem.
cdc_acm 1-3:1.2: ttyACM1: USB AON device
cdc_acm 1-3:1.4: This device cannot do calls on its own. It is not a modem.
cdc_acm 1-3:1.4: ttyACM2: USB AON device
cdc_acm 1-3:1.6: This device cannot do calls on its own. It is not a modem.
cdc_acm 1-3:1.6: ttyACM3: USB AON device
cdc_acm 1-3:1.8: This device cannot do calls on its own. It is not a modem.
cdc_acm 1-3:1.8: ttyACM4: USB AON device
cdc_acm 1-3:1.10: This device cannot do calls on its own. It is not a modem.
cdc_acm 1-3:1.10: ttyACM5: USB AON device
cdc_acm 1-3:1.12: setting rx max = 8384
nc_acm 1-3:1.12: cdc-wdm: USB AON driver
cdc_acm 1-3:1.12: wwan0: register 'cdc_acm' at usb-0000:00:1a.7-3, CDC MBIM, eea2:20:7f:01:7d
```

Fig 25: #USBCFG=3, Ubuntu
8.1.5  #USBCFG=4

Set USB mode 4.
AT#USBCFG=4
OK

Activate the just set mode
AT#REBOOT
OK

Fig 26: #USBCFG=4
If the device driver is not installed, and you plug in the USB cable, the "Device Manager" displays the folder "Other devices". See the figure on the right, and compare it with the Tab 2: #USBCFG Mode

8.1.5.1 Ubuntu

The figure shows the message returned by the dmesg command when you plug in the USB cable. This OS uses the in-box driver, see Telit idVendor=1bc7, and idProduct=0037 (#USBCFG=4).

Fig 27: #USBCFG=4, Ubuntu
8.1.6 #USBCFG=5

Set USB mode 5.
AT#USBCFG=5
OK

Activate the just set mode
AT#REBOOT
OK

Fig 28: #USBCFG=5
If the device driver is not installed, and you plug in the USB cable, the "Device Manager" displays the folder "Other devices". See the figure on the right, and compare it with the Tab 2: #USBCFG Mode.

8.1.6.1 Ubuntu

The figure shows the message returned by the dmesg command when you plug in the USB cable. This OS uses the in-box driver, see Telit idVendor=1bc7, and idProduct=0033 (#USBCFG=5).

Fig 29: #USBCFG=5, Ubuntu
8.2 USB Driver

Telit provides the USB driver to install on Windows-PC. Before installing the driver, it is suggested to remove the old one, if present. To verify if the right USB driver has been installed check its Vendor Identifier and the Product Identifier shown by the Windows Device Manager, see the figure on the right side.

To have more info on USB driver installation refer to document [7]

Fig 30: Vendor Identifier & Product Identifier

- Telit Vendor Identifier is 1BC7.
- Product Identifier depends on the #USBCGF mode, refer to Tab 2: #USBCFG Mode

8.2.1 Ubuntu

With Ubuntu, the USB device (module) uses the in-box drivers. It means that no Telit's USB driver is needed. To get Telit Vendor Identifier and Product Identifier in Ubuntu environment use the command dmesg as shown in sub-chapters of the chapter 8.1. To have more information refer to document [4].
9 DOCUMENT HISTORY

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<tr>
<td>0</td>
<td>2016-02-10</td>
<td>First issue</td>
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<td>2017-10-23</td>
<td>Adopted new template, and converted all pictures in .png format.</td>
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Updated chapter:
1.5 Related Documents.

Removed chapters:
7 The Winning Configuration
8.2 USB Interfaces & Endpoints

Added:
the Platform Version ID, and the LE910 Cat1 SERIES in the Applicability Table.

Changed:
the document title into: LE910 V2, LE910 Cat1 Ports Arrangements User Guide.
SUPPORT INQUIRIES

Link to www.telit.com and contact our technical support team for any questions related to technical issues.

www.telit.com

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