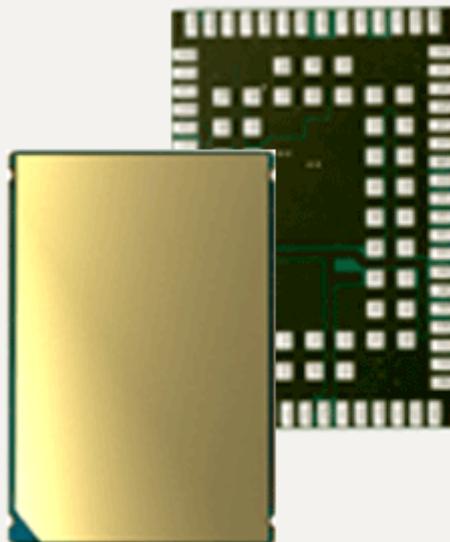


Getting Started with Cinterion[®] EMS31

User Guide

Version: 01b

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Contents

0	Document History	4
1	Introduction	5
1.1	Supported Products	6
1.2	Related Documents	6
2	Getting Started with EMS31	7
2.1	Technical Requirements for Using EMS31 Modules	7
2.2	Connecting the EMS31 Evaluation Module to the DSB75	8
2.3	Start Up the Module	11
3	Appendix: AH6-DSB75 Adapter	12
4	Appendix: Circuit Diagrams for Evaluation Module Board	14

0 Document History

Preceding document: "Getting Started with Cinterion® EMS31" Version 01a

New document: "Getting Started with Cinterion® EMS31" Version 01b

Chapter	What is new
4	Replaced circuit diagrams.

Preceding document: "Getting Started with Cinterion® EMS31" Version 01

New document: "Getting Started with Cinterion® EMS31" Version 01a

Chapter	What is new
Throughout document	ASC1 interface replaced with ASC0 as default interface for SW upgrade.
2.3	Baudrate 921600 changed to 115200.

New document: "Getting Started with Cinterion® EMS31" Version 01

Chapter	What is new
---	Initial document setup.

1 Introduction

This document describes a ready-to-use development and test environment for the Cinterion® EMS31 SMT modules.

The development and test environment comprises the following hardware components

- EMS31 evaluation module (for supported products see [Section 1.1](#))
The EMS31 evaluation module consists of the actual EMS31 SMT module soldered onto a PCB with a board-to-board connector and U.FL antenna connector. For EMS31 evaluation module board schematics see [Section 4](#).
- DSB75 Development Support Board
The EMS31 evaluation module needs to connect to an adequate carrier board such as the DSB75. A detailed DSB75 hardware interface description and operating instructions can be found in [\[3\]](#).
- AH6-DSB75 Adapter.
The AH6-DSB75 Adapter is used to mount the EMS31 evaluation module to the DSB75.

The purpose of this document¹ is to guide you through the process of connecting the hardware, installing the supplied drivers for Microsoft® Windows 7 and getting started with EMS31.

Note: The hardware components listed above as part of a development and test environment are also mentioned in [\[2\]](#) as part of the comprehensive reference equipment used by Gemalto M2M for type approval. For general development and test purposes however, there is alternative equipment available: The DSB75 may be replaced by the DSB-Mini (for details see [\[4\]](#)), the AH6-DSB75 Adapter by the Starter Kit B80, either plugged onto the DSB-Mini or as a stand-alone device (for more information see [\[5\]](#)).

¹ The document is effective only if listed in the appropriate Release Notes as part of the technical documentation delivered with your Gemalto M2M wireless module.

1.1 Supported Products

This document applies to the following Gemalto M2M modules:

- Cinterion® EMS31-V Module
- Cinterion® EMS31-US Module

EMS31 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] EMS31 AT Command Set
- [2] EMS31 Hardware Interface Description
- [3] DSB75 Development Support Board Hardware Interface Description
- [4] DSB-Mini User Guide
- [5] Starter Kit B80 User Guide

2 Getting Started with EMS31

2.1 Technical Requirements for Using EMS31 Modules

- EMS31 evaluation module. For EMS31 evaluation module schematics see [Appendix: Circuit Diagrams for Evaluation Module Board](#)
- Computer running Windows 7, USB 2.0 High Speed compatible
- Local administrator privileges on the particular Windows computer to install and uninstall the drivers
- DSB75 Development Support Board (for details see [\[3\]](#))
- AH6-DSB75 Adapter required for mounting the evaluation module to the DSB75. For more information about the AH6-DSB75 Adapter please refer to [Appendix: AH6-DSB75 Adapter](#).
- Accessories:
 - 50 Ohms antenna adapter cables with SMT connectors to connect the U.FL connectors on the EMS31 evaluation module to the U.FL connectors on AH6-DSB75 Adapter (e.g. a Hirose - Hirose cable such as delivered with each DSB75) - 1 for the main antenna (RF_OUT).
 - External 50 Ohms RF antenna with SMA connector to connect the SMA connectors on the AH6-DSB75 Adapter (e.g. a SMARTEQ MiniMag antenna such as delivered with each DSB75)
 - 9 to 15 Volts power supply applied at the DSB75 for powering up the DSB75 and the connected EMS31 evaluation module (not supplied by Gemalto M2M)
 - RS-232/USB converters and USB cables or Serial-to-USB cables for the module's asynchronous serial interfaces ASC0 and ASC1 (not supplied by Gemalto M2M).
- Appropriate application for controlling the module from within a PC's operating system. For Windows, e.g. Windows Hyperterminal, PuTTY.

2.2 Connecting the EMS31 Evaluation Module to the DSB75

To properly connect the EMS31 evaluation module and all accessories to the DSB75 please complete the steps listed below. The complete setup with the evaluation module mounted onto the AH6-DSB75 Adapter and the AH6-DSB75 Adapter connected to the DSB75 is shown in [Figure 2](#).

- Ensure that all jumpers and slide switches on the DSB75 are set to their default positions as shown in [Figure 1](#) and in [\[3\]](#).
- Attach the 80-pin header of the AH6-DSB75 Adapter to the 2x40-pin connector (X101/X202) located on the DSB75. Take gentle care that all pins are aligned correctly, then press down evenly on the adapter until it is firmly seated.
- Remove the knurled nuts from the AH6-DSB75 Adapter.
- Mount the EMS31 evaluation module onto the 80-pin board-to-board connector X120 of the AH6-DSB75 Adapter.
- Fasten the knurled nuts to secure the module to the AH6-DSB75 Adapter.
- Use the small antenna cables to connect the U.FL RF connector for the main antenna on the EMS31 evaluation module to the U.FL-R SMT connector on the AH6-DSB75 Adapter:
 - for main antenna connect to X391.
- Screw the external antenna to the appropriate SMA connectors on the AH6-DSB75 Adapter:
 - Main antenna to X390
- Insert the SIM card into the card reader located at the AH6-DSB75 Adapter.
Note: Do not use the SIM card reader of the DSB75 Support Board.
- To employ the module's asynchronous serial interfaces ASC0 and/or ASC1, connect the 9-pin SubD connectors on the DSB75 to the PC's USB ports using the RS-232/USB converters and USB cables or Serial-to-USB cables. Use COM1 (X201) for the first serial interface ASC0 and/or COM2 (X202) for second serial interface ASC1.
- Make sure that the power supply adapter delivers 12 Volts, and connect the power cables to the red (X400 = BATT+) and black (X401 = Ground) connectors of the DSB75 Support Board.

After connecting the EMS31 evaluation module to the DSB75 the module can be switched on. The initial startup is described in [Section 2.3](#).

2.2 Connecting the EMS31 Evaluation Module to the DSB75

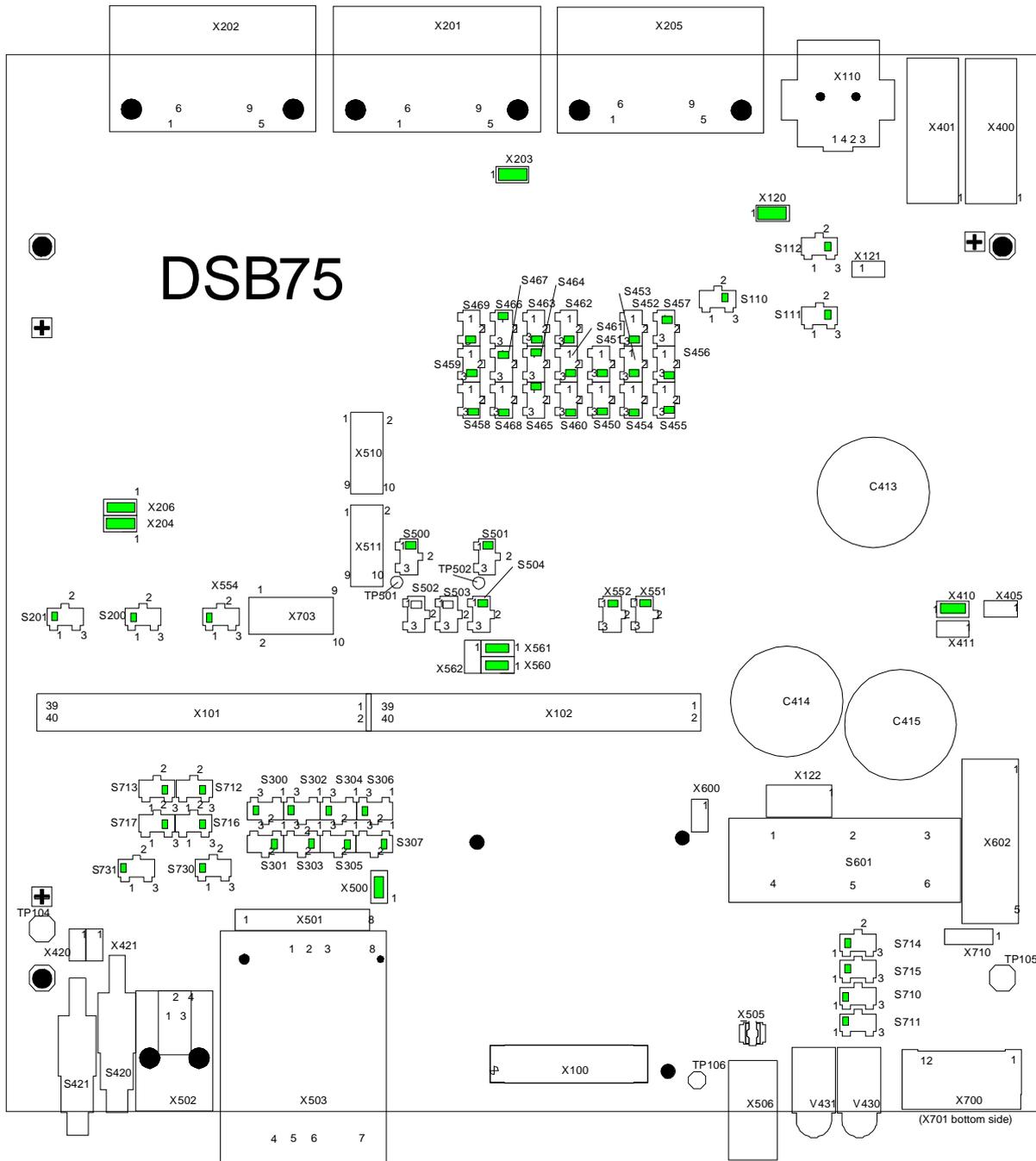


Figure 1: DSB75 configuration

2.2 Connecting the EMS31 Evaluation Module to the DSB75

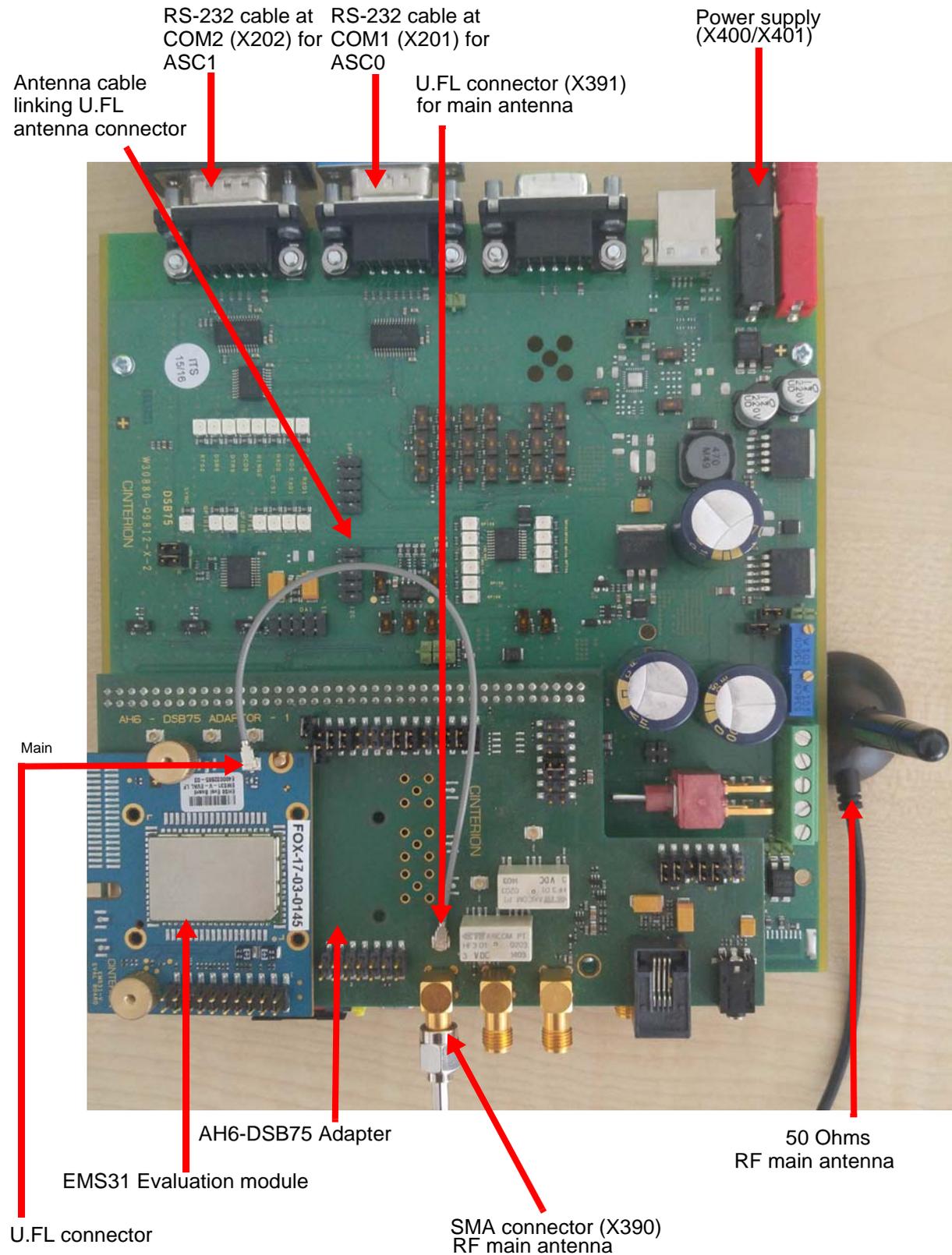


Figure 2: Module mounted onto AH6-DSB75 Adapter and connected to DSB75

2.3 Start Up the Module

After connecting the EMS31 evaluation module to the DSB75 as described in [Section 2.2](#), the module can be switched on. Note: ASC0 serial interface is set as a default interface for firmware upgrade and AT commands execution.

- Start the Windows PC.
- The module is switched ON automatically after the power supply is connected to DSB75 board.
- To connect to the EMS31 evaluation module via asynchronous serial interface, for example ASC0, check for the port that is connected to the DSB75's COM2 X201 via RS-232/USB converter and USB cable or via Serial-to-USB cable, call a terminal program on the PC and connect to the EMS31 evaluation module using the following initial settings:
 - Bits per seconds: 115200
 - Data bits: 8
 - Parity: None
 - Stop bits:1
 - Flow control: HardwareType the AT command ATI to display module identification information.

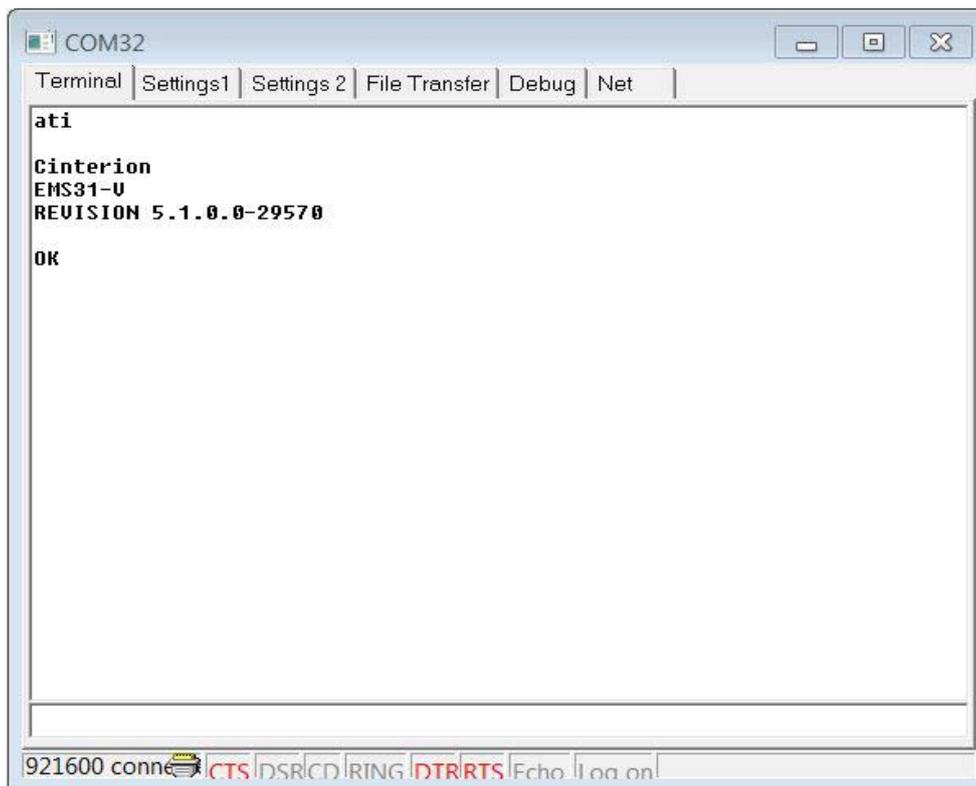


Figure 3: Connection via ASC0 interface

For a complete AT Command Set description see [\[1\]](#). This includes AT commands to configure the communication interfaces.

3 Appendix: AH6-DSB75 Adapter

The EMS31 Evaluation Module connects to the 80-pin board-to-board connector X120 on top of the AH6-DSB75 Adapter. The 2x40-pin header X101/X102 of the DSB75 Support Board connects to the 80-pin female connector X135 located on the back of the AH6-DSB75 Adapter.

By default, when shipped from factory, all jumpers on the AH6-DSB75 Adapter are set for use with EMS31, see [Figure 5](#).

The adapter is illustrated in [Figure 4](#) and [Figure 5](#).

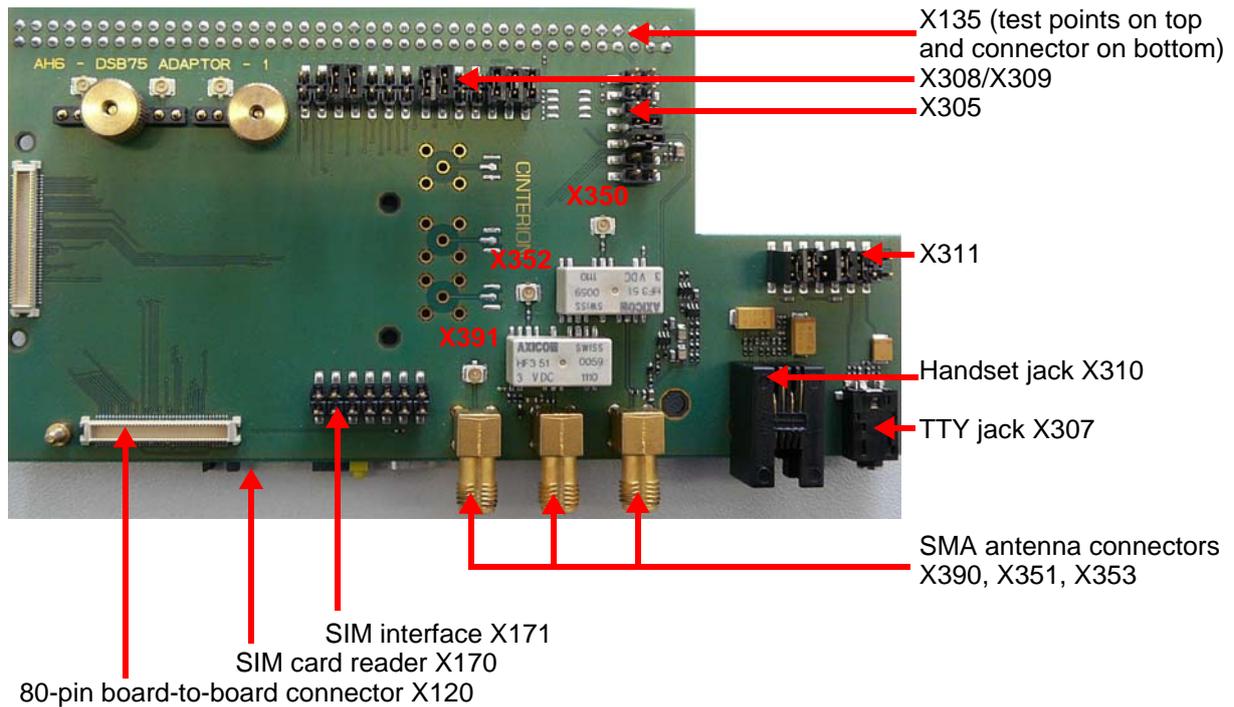


Figure 4: AH6-DSB75 Adapter with default jumper positions

3 Appendix: AH6-DSB75 Adapter

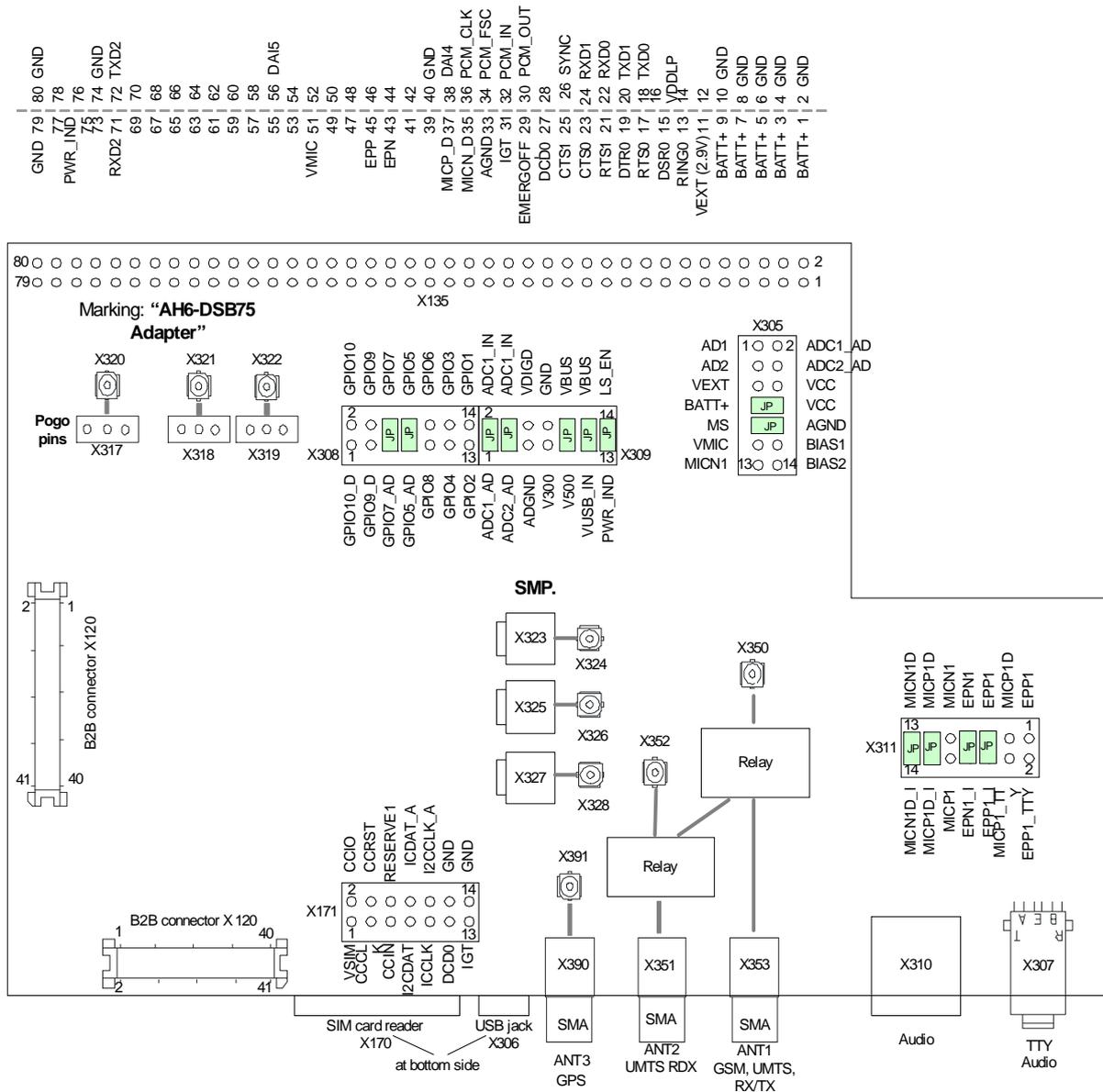
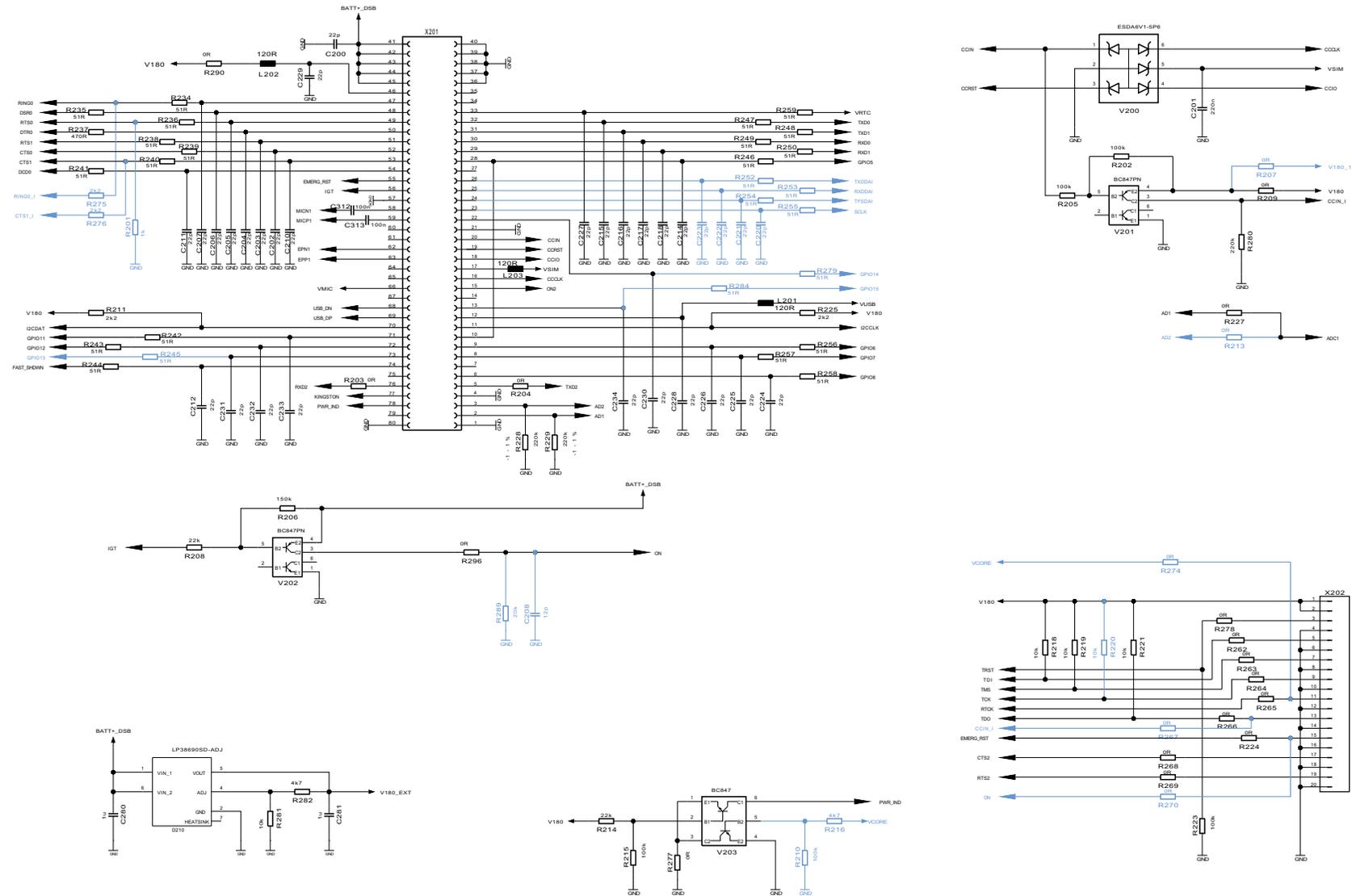


Figure 5: AH6-DSB75 Adapter - connectors, jumpers



Note: Circuit elements marked blue are not (yet) populated on the EMS31 evaluation module boards, and thus reserved for future use. Black circuit elements apply to the complete EMS31 family - though not every feature/pad is supported by every product.

Figure 7: Schematic sheet 2

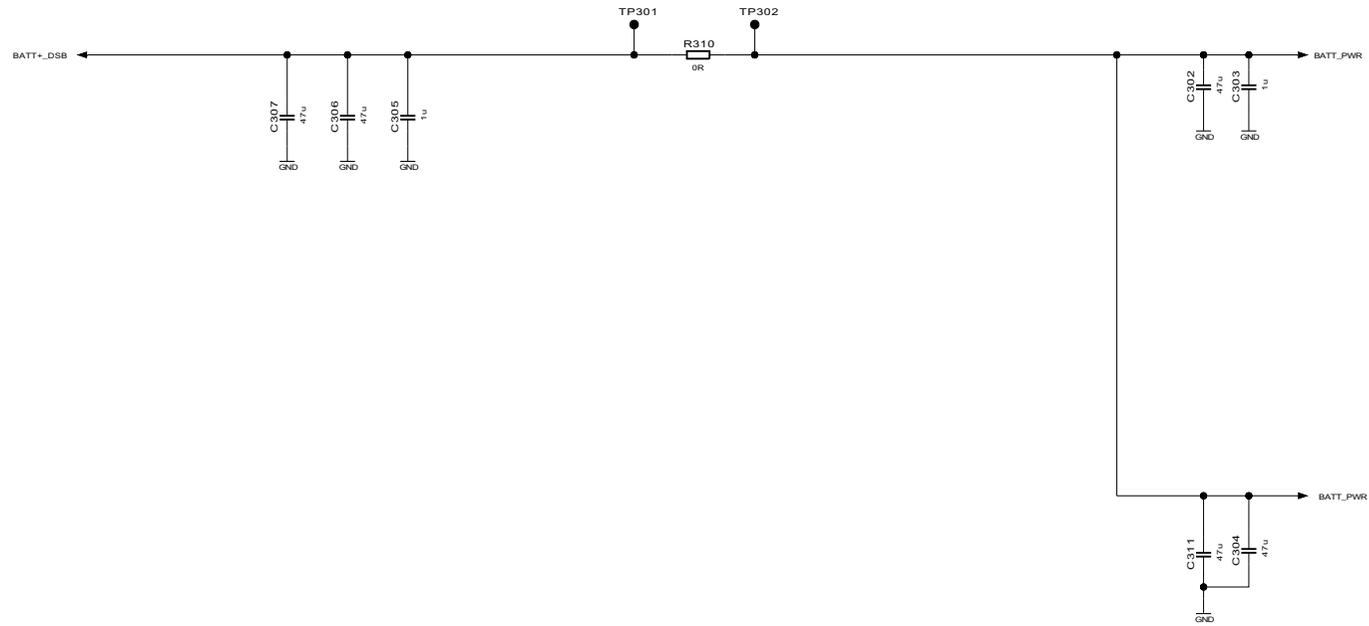


Figure 8: Schematic sheet 3

About Gemalto

Since 1996, Gemalto has been pioneering groundbreaking M2M and IoT products that keep our customers on the leading edge of innovation.

We work closely with global mobile network operators to ensure that Cinterion[®] modules evolve in sync with wireless networks, providing a seamless migration path to protect your IoT technology investment.

Cinterion products integrate seamlessly with Gemalto identity modules, security solutions and licensing and monetization solutions, to streamline development timelines and provide cost efficiencies that improve the bottom line.

As an experienced software provider, we help customers manage connectivity, security and quality of service for the long lifecycle of IoT solutions.

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