



HL781x Series

Migration Guide



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>> 1: Introduction

This document aims to provide a guideline for designing applications based on the HL78x series of embedded modules.

HL78x variants covered in this migration guide include:

- HL7810
- HL7812

1.1 Modules for Migration

Recommendations are provided to maximize compatibility between applications (customer boards) when using different variants of the HL78x series, especially when migrating from the following modules:

1.1.1 HL780x Series to HL781x Series

The following table lists which HL modules can be migrated to a compatible HL78x module.

Table 1-1: HL780x to HL781x Series Compatibility

HL Module	Compatible HL Module
HL7800	HL7810
HL7802	HL7812

>> 2: General Information

2.1 List of Approvals

The following table lists the regional carrier and regulatory approvals for the HL780x and HL781x series modules.

Table 2-1: HL780x and HL781x Series Approvals

Module	Carrier Approval Based on Region	
	Region / Country	Carrier Approval / Certification
HL7800	Global	AT&T Verizon Sprint SouthernLINC Rogers Telus NTT Docomo KDDI Vodafone Deutsche Telekom Telstra Spark Sierra Wireless
	USA	FCC
	Canada	ISED
	EU	RoHS
	Japan	JPA, JRF
	Australia	RCM
	Korea	KC
HL7802	Global	AT&T Verizon Orange Vodafone Sierra Wireless
	USA	FCC
	Canada	ISED
	EU	RoHS
	Australia	RCM

Table 2-1: HL780x and HL781x Series Approvals (Continued)

Module	Carrier Approval Based on Region	
	Region / Country	Carrier Approval / Certification
HL7810	Global	AT&T (includes FirstNet) Orange Verizon Deutsche Telekom Rogers GCF
	USA	FCC
	Canada	ISED
	EU	CE, RoHS
	Japan	JPA, JRF
	Taiwan	NCC
	Korea	KC
HL7812	Global	AT&T Orange Verizon Deutsche Telekom GCF
	USA	FCC
	Canada	ISED
	EU	CE, RoHS
	Japan	JPA, JRF

>> 3: Hardware Migration

To maintain proper forward compatibility and offer additional hardware features, the following hardware guidelines are defined.

3.1 HL780x Series to HL781x Series

3.1.1 HL780x Series to HL781x Series Pin Comparison

Pin definitions are the same between HL7800 and HL7810, as well as HL7802 and HL7812

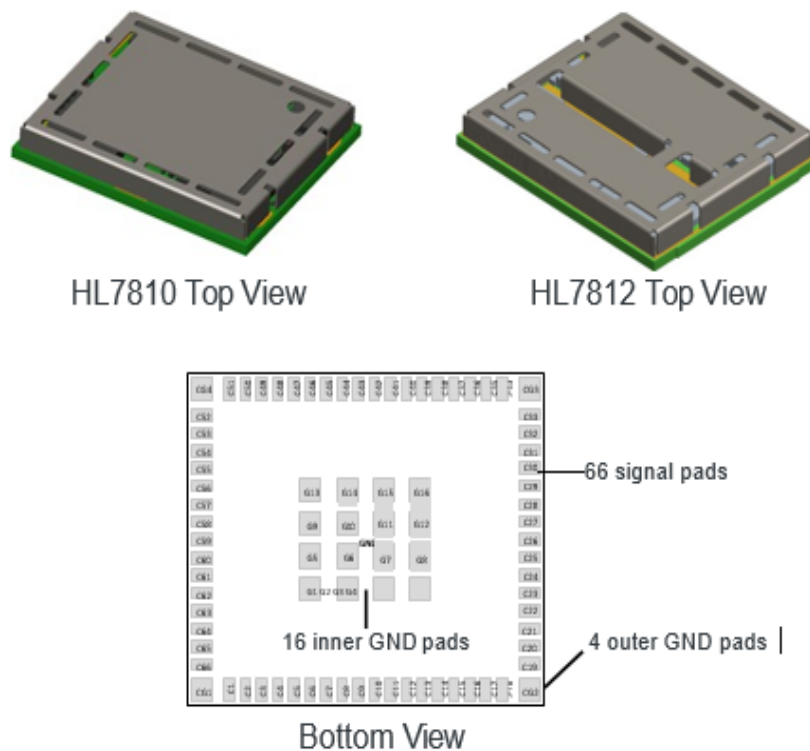


Figure 3-1: HL781x Series pins

3.1.2 Mounting Guidelines for the HL781x Series Modules

Important: Avoid routing any noisy signals or sensitivity traces under the module on the application board.

For additional information on mounting the module, refer to the AirPrime HL78xx Series Customer Process Guidelines and HL781x Product Technical Specifications stated in the Reference section of this guide.

3.1.3 Band Comparison

Table 3-1: HL7800, HL7802, HL7810, and HL7812

	HL7800	HL7802	HL7810	HL7812
Cat-M1	1, 2, 3, 4, 5, 8, 12, 13, 18, 19, 20, 25, 26, 27, 28, 66	1, 2, 3, 4, 5, 8, 12, 13, 14, 18, 19, 20, 25, 26, 27, 28, 66	1, 2, 3, 4, 5, 8, 12, 13, 18, 19, 20, 25, 26, 28, 66, 85	1, 2, 3, 4, 5, 8, 12, 13, 18, 19, 20, 25, 26, 28, 66, 85
Cat-NB1 (or NB2)	1, 2, 3, 4, 5, 8, 12, 13, 17, 18, 19, 20, 25, 26, 28, 66	1, 2, 3, 4, 5, 8, 12, 13, 14, 17, 18, 19, 20, 25, 26, 28, 66	1, 2, 3, 4, 5, 8, 12, 13, 18, 19, 20, 25, 26, 28, 66, 85	1, 2, 3, 4, 5, 8, 12, 13, 18, 19, 20, 25, 26, 28, 66, 85
GSM		GSM 850, E-GSM 900, DCS 1800, PCS 1900		GSM 850, E-GSM 900, DCS 1800, PCS 1900

>> 4: Software Information

This chapter shows an overview of the HL780x and HL781x modules' software features.

4.1 HL780x and HL781x Series Key Features

4.1.1 Stateful Hibernation— HL7810, HL7812, and HL7845

Stateful hibernation allows data to be saved in retention memory prior to hibernation. This leads to faster wake up times and optimization of power consumption.

HL7810, HL7812, and HL7845 optimize memory usage that uses stateful hibernation.

Modem settings are saved in flash so that they can be re-used upon wakeup. This is not done in the HL780x firmware.

In HL7810, HL7812, and HL7845, memory usage is reduced through the delivery of SSI's compression feature. In this mode, the application layer contexts are retained during hibernation.

In stateful hibernation (upon entry into hibernation) necessary memory context is saved to retention memory and to a specific partition of flash memory. All module states will be retained. Customer application design needs to factor in that the modem state will not be reset, as in the case of HL78xx when migrating to HL781x.

Key Benefits:

- No warm boot time compared to stateless hibernation
- Better overall power consumption

The following section highlights key differences in power consumption between HL780x and HL781x series modules.

4.1.1.1 Differences in Power Consumption

Scenario: Let module perform 3 PSM cycles to result in 3 sleep and wake times

Table 4-1: HL780x vs. HL781x Comparison

PSM - T3412: 1hr T3324: 20s	Avg. current	Avg. current / duration Sleep (After T3324 expired) Wake (After T3412 expired)
HL7800 / HL7802	87.1 μ A	Sleep: 11.8 mA / 5.685 sec Wake: 41.5 mA / 3.160 sec
HL7810 / HL7812 / HL7845	54.4 μ A	Sleep: 10.5 mA / 7.130 sec Wake: 48.3 mA / 0.928 sec



Figure 4-1: HL7800 average



Figure 4-2: HL7800 sleep (modules prepare suspend/hibernation and save memory context to retention memory during preparation)

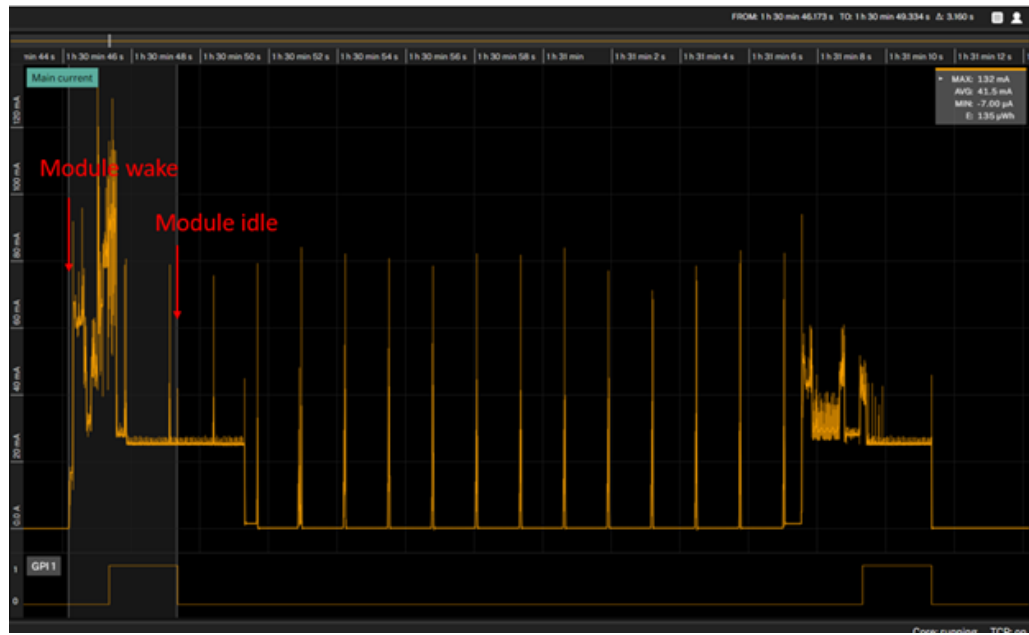


Figure 4-3: HL7800 wake (modules wake up, do TAU and then become idle)



Figure 4-4: HL7810 average



Figure 4-5: HL7810 sleep (modules prepare suspend/hibernation and save memory context to retention memory during preparation)

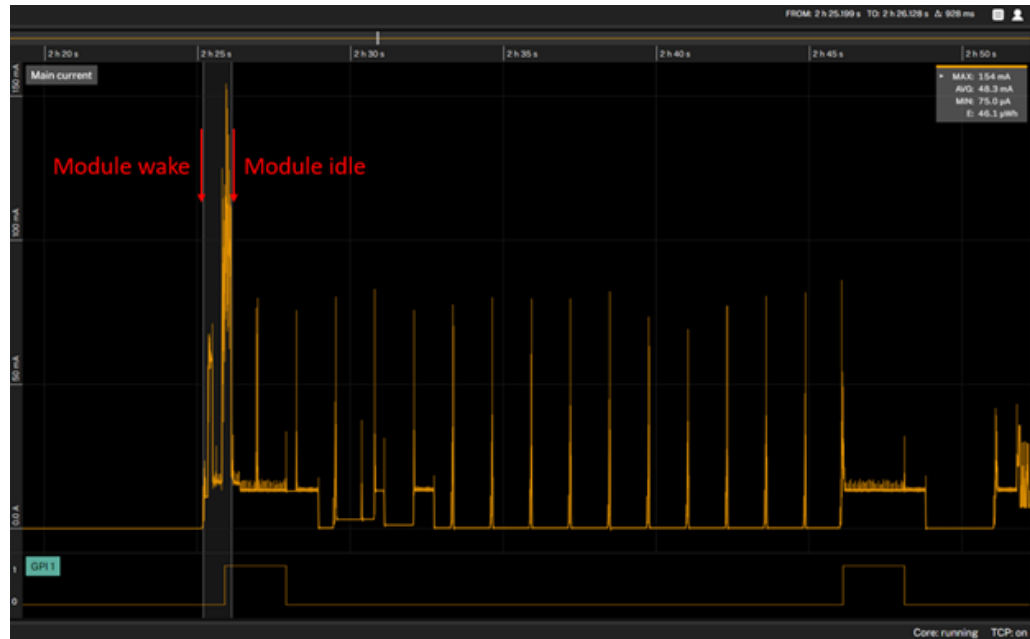


Figure 4-6: HL7810 wake (modules wake up and do TAU and then become idle)

4.1.2 AT Commands

HL780x and HL781x series modules use the same AT command guide. For details on the latest changes made, you may download the HL78xx AT Commands Interface Guide from <http://source.sierrawireless.com/> and refer to the Revision History of the document.

>> 5: References

For more details, several references can be consulted, as detailed below.

5.1 Website Support

Check <http://source.sierrawireless.com/> for the latest documentation available.

5.2 Reference Documents

1. HL78xx Series Customer Process Guidelines
Reference: 4112095
2. HL781x Product Technical Specification
Reference: 41114133
3. HL78xx AT Command Reference Guide
Reference: 41111821