
Serial Peripheral Interface Command Sheet

Introduction

This user guide provides a summary of all Serial Peripheral Interface (SPI) commands available with the ATA8510 Ultra High Frequency (UHF) product family, including a detailed command description, the setup procedure, command coding, and descriptions of the available parameters. This document also includes the SPI timing calculation, which helps to ensure proper timing in the application. This document is applicable for the following products:

- ATA8510
- ATA8515
- ATA8210
- ATA8215
- ATA8710

Table of Contents

Introduction.....	1
1. Quick References.....	3
1.1. Reference Documentation.....	3
1.2. Acronyms and Abbreviations.....	3
2. SPI Commands Overview.....	4
3. SPI Timing Calculation.....	7
4. Document Revision History.....	8
The Microchip Website.....	9
Product Change Notification Service.....	9
Customer Support.....	9
Microchip Devices Code Protection Feature.....	9
Legal Notice.....	9
Trademarks.....	10
Quality Management System.....	11
Worldwide Sales and Service.....	12

1. Quick References

1.1 Reference Documentation

For further details, refer to the *ATA8510/15 Industrial User's Guide* (DS50003142).

1.2 Acronyms and Abbreviations

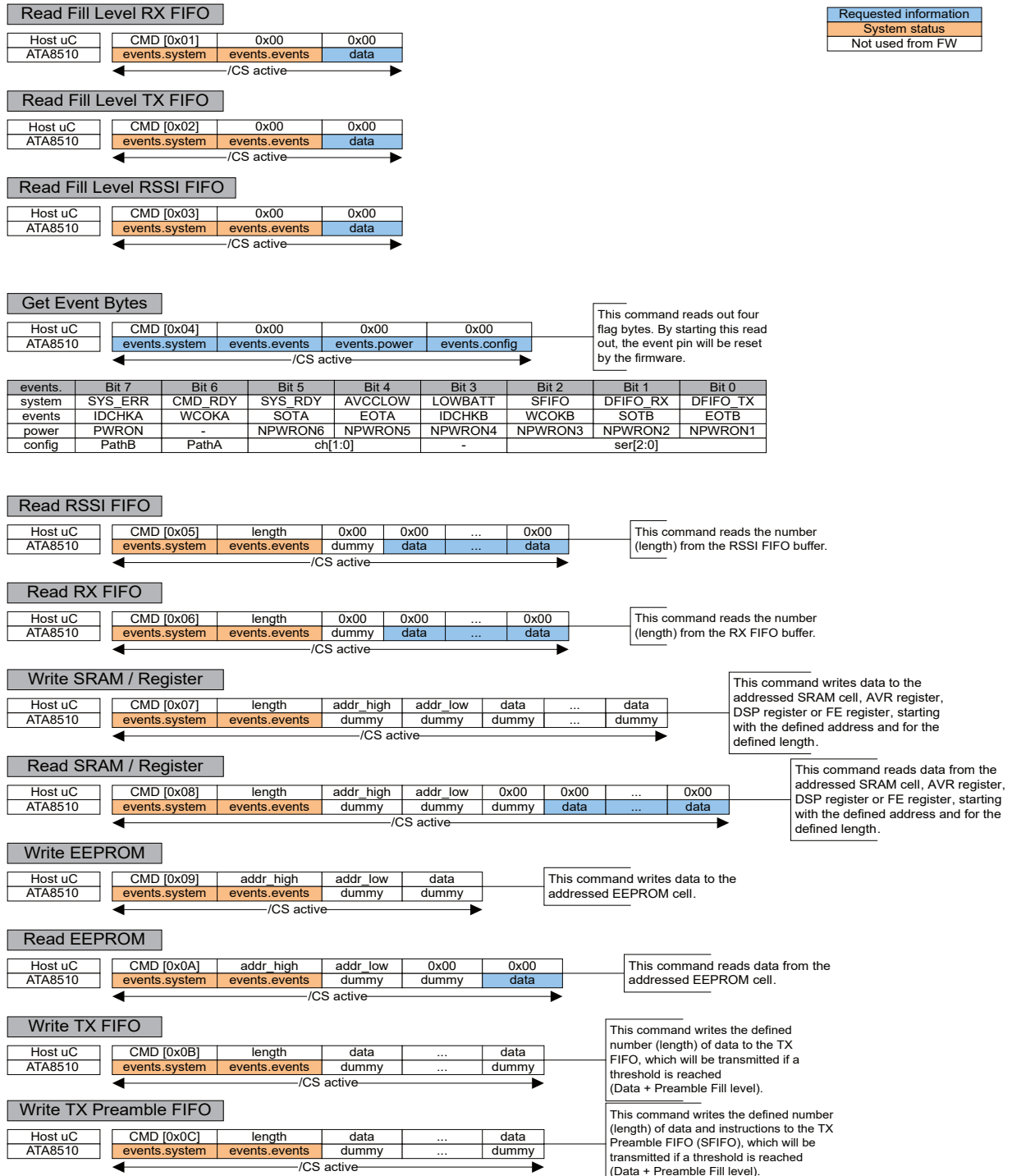
Table 1-1. Acronyms and Abbreviations

Acronyms/Abbreviations	Description
EEPROM	Electrically Erasable Programmable Read-only Memory
FIFO	First-In First-Out
FW	Firmware
IRQ	Interrupt Request
ROM	Read-only Memory
RSSI	Received Signal Strength Indicator
RX	Receiver
SPI	Serial Peripheral Interface
SRAM	Static Random Access Memory
SCK	Serial Clock
SFIFO	Support First In First Out
TX	Transmitter
uC	Microcontroller
UHF	Ultra High Frequency

2. SPI Commands Overview

Following are the SPI commands and their descriptions.

Figure 2-1. SPI Commands



ATA8510

SPI Commands Overview

Set System Mode

Host uC	CMD [0x0D]	systemModeConfig	serviceChannelConfig
ATA8510	events.system	events.events	dummy

/CS active

Name	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
systemMode Config	RF_CAL	ANT_TUNE	VCO_TUNE	IDLEMode Selector	-	TMDEN	OPM[1:0]	
Name	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
serviceChannel Config	enaPathB	enaPathA	channel[1:0]		-	service[2:0]		

for OPM PollingMode only

Name	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
serviceChannel Config	-	-	-	-	startPollingIndex			

Requested information
System status
Not used from FW

OPM 0:0 IDLEMode
OPM 0:1 TXMode
OPM 1:0 RXMode
OPM 1:1 PollingMode

Calibrate and Check

Host uC	CMD [0x0E]	tuneCheckConfig	serviceChannelConfig
ATA8510	events.system	events.events	dummy

/CS active

Name	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
tuneCheck Config	EN_ANT_TUNE	EN_TEMP_MEAS	EN_SRCCAL	EN_FRCCAL	EN_VCOCAL	-	EN_SELF_CHECK	-
Name	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
serviceChannel Config	enaPathB	enaPathA	channel[1:0]		-	service[2:0]		

This command starts a calibrate, tune or self-check action on the requested path, channel and service.

Read RX FIFO Byte Interrupt

Host uC	CMD [0x1D]	0x01	0x01	...	0x01	0x00	0x00
ATA8510	events.system	events.events	data	...	data	data	data

/CS active

This command reads the data from the RX FIFO buffer without the definition of length.

Read RSSI FIFO Byte Interrupt

Host uC	CMD [0x1E]	0x01	0x01	...	0x01	0x00	0x00
ATA8510	events.system	events.events	data	...	data	data	data

/CS active

This command reads the data from the RSSI FIFO buffer without the definition of length.

The increment mechanism needs to be performed as followed to ensure that the right data will be provided:
Parameter at byte n-x [x>=2] = 0x01
Parameter at byte n-y [y<=1] = 0x00
[n = number of bytes transmitted via SPI]

Get Version ROM

Host uC	CMD [0x12]	0x00	0x00
ATA8510	events.system	events.events	rom version

/CS active

Get Version Flash

Host uC	CMD [0x13]	0x00	0x00	0x00	0x00	0x00
ATA8510	events.system	events.events	rom version	flash version high byte	flash version low byte	cust. specific version

/CS active

System Reset

Host uC	CMD [0x15]	0x00
ATA8510	events.system	events.events

/CS active

OFF Command

Host uC	CMD [0x18]	0x00
ATA8510	events.system	events.events

/CS active

Set Voltage Monitor

Host uC	CMD [0x17]	value
ATA8510	events.system	events.events

/CS active

0x00	disable	0x08	2.7V
0x01	2.0V	0x09	2.8V
0x02	2.1V	0x0A	2.9V
0x03	2.2V	0x0B	3.0V
0x04	2.3V	0x0C	3.1V
0x05	2.4V	0x0D	3.2V
0x06	2.5V	0x0E	3.3V
0x07	2.6V	0x0F	3.4V

Start RSSI Measurement

Host uC	CMD [0x1B]	serviceChannelConfig
ATA8510	events.system	events.events

← /CS active →

Note: For details on how this byte is structured, see *serviceChannelConfig* of *Set System Mode* command.

Requested information
System status
Not used from FW

Get RSSI Value

Host uC	CMD [0x1C]	0x00	0x00	0x00
ATA8510	events.system	events.events	RSSAV	RSSPK

← /CS active →

Read Temperature Value

Host uC	CMD [0x19]	0x00	0x00	0x00
ATA8510	events.system	events.events	tempVal_high	tempVal_low

← /CS active →

Init SRAM Service

Host uC	CMD [0x1A]	sramServiceNr	eepServiceNr
ATA8510	events.system	events.events	dummy

← /CS active →

Customer Configurable Command

Host uC	CMD [0x14]	0x00
ATA8510	events.system	events.events

← /CS active →

Patch SPI

Host uC	CMD [0x0F]	parameter
ATA8510	events.system	events.events

← /CS active →

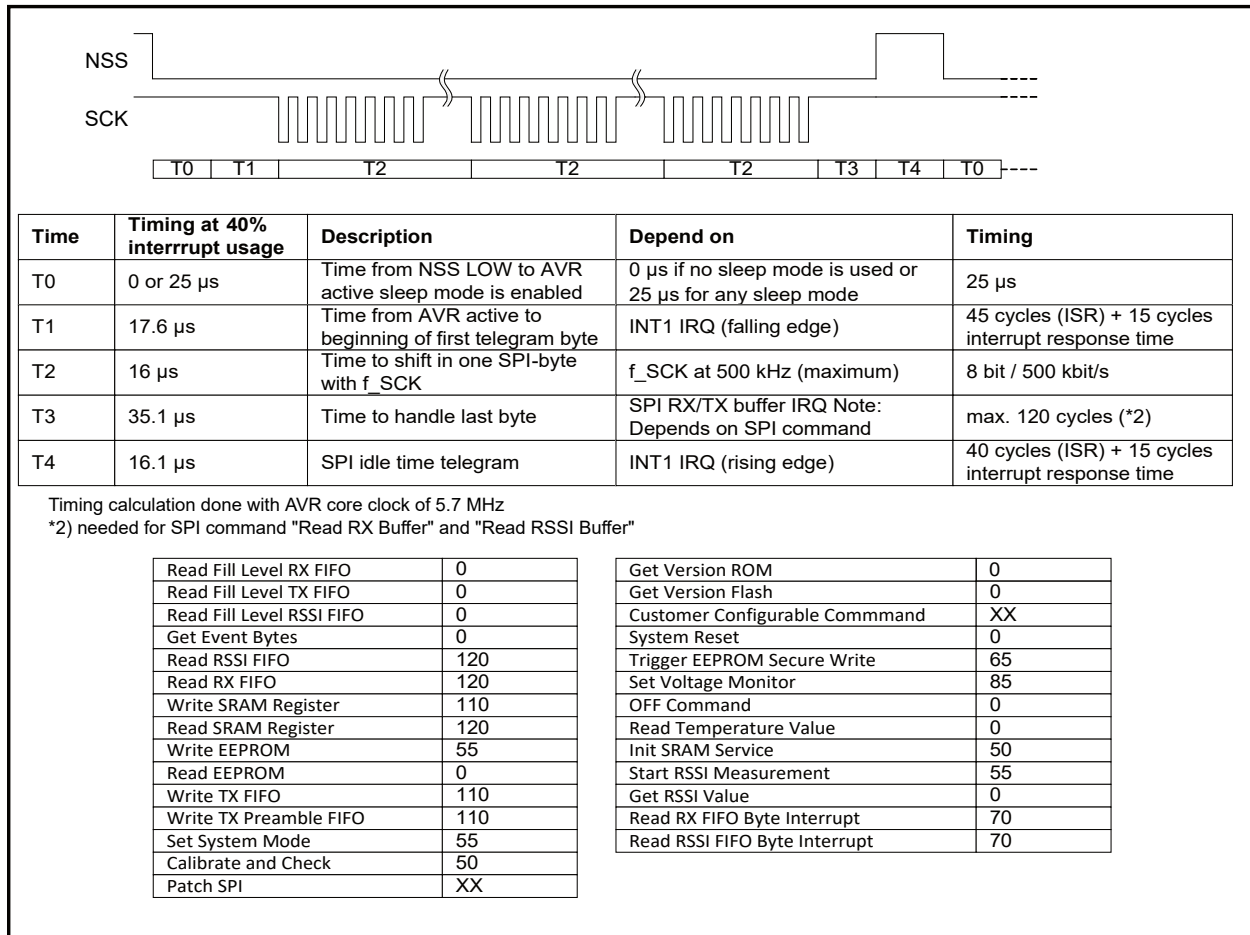
Trigger EEPROM Secure Write

Host uC	CMD [0x16]	0xAA	0xCC	0xF0
ATA8510	events.system	events.events	dummy	dummy

← /CS active →

3. SPI Timing Calculation

Figure 3-1. SPI Timing Calculation



4. Document Revision History

Revision	Date	Section	Description
A	12/2021	Document	Initial release

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ISBN: 978-1-5224-9403-4

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