

# Application Note

## DA1469x Booting from Serial Interfaces

### AN-B-069

#### Abstract

*The DA1469x can boot from external serial devices to enable development of application code or to connect to an external (micro)controller. At power-up the system listens on the serial interface and tries to load the boot code from an external host. This document describes the booting sequence for the serial interfaces and provides developers with the necessary information for realizing the protocol required for establishing communication between an external device and the DA1469x.*

---

DA1469x Booting from Serial Interfaces

Contents

**Abstract** ..... 1

**Contents** ..... 2

**Figures**..... 2

**Tables** ..... 2

**1 Terms and Definitions**..... 3

**2 References** ..... 3

**3 Introduction**..... 4

**4 Booting** ..... 4

    4.1 Booting Sequence ..... 4

    4.2 Interface ..... 4

**5 Retrieve Application Code**..... 6

    5.1 Code Retrieval Sequence ..... 6

    5.2 Code Retrieval Protocol ..... 6

**Revision History** ..... 8

Figures

Figure 1: Main Boot Flow Phases ..... 5

Figure 2: Get Firmware from UART ..... 7

Tables

Table 1: UART Legacy Protocol (<64 kB) ..... 6

Table 2: UART Extended Protocol ..... 6

---

**DA1469x Booting from Serial Interfaces****1 Terms and Definitions**

OTP	One Time Programmable (memory)
SW	Software
STX	Start of Text (ASCII character)
SOH	Start of Heading (ASCII character)
URX	UART Receive port
UTX	UART Transmit port

**2 References**

- [1] DA1469x, Datasheet, Dialog Semiconductor.

---

## DA1469x Booting from Serial Interfaces

### 3 Introduction

The DA1469x can source code from two different locations. It can be either a serial port (UART) or an attached QPSI flash device. The DA1469x family can load from a serial interface with an image size of up to 128 kbytes

This document covers the requirements for loading code through the serial port and starting to execute it.

### 4 Booting

#### 4.1 Booting Sequence

The DA1469x booting sequence is described in [Figure 1](#). In this document we will detail the procedure in the box "**Get FW From UART**" in the "**Retrieve Application Code**" section of the booting procedure.

#### 4.2 Interface

The DA1469x boot on a unique UART serial interface. The UART configuration is the following:

- DA1469x Tx pin: P0\_09
- DA1469x Rx pin: P0\_08
- Baud rate: 115200 bps
- 8 bits data transmission LSB first
- 1 start bit
- 1 stop bit
- No parity

DA1469x Booting from Serial Interfaces

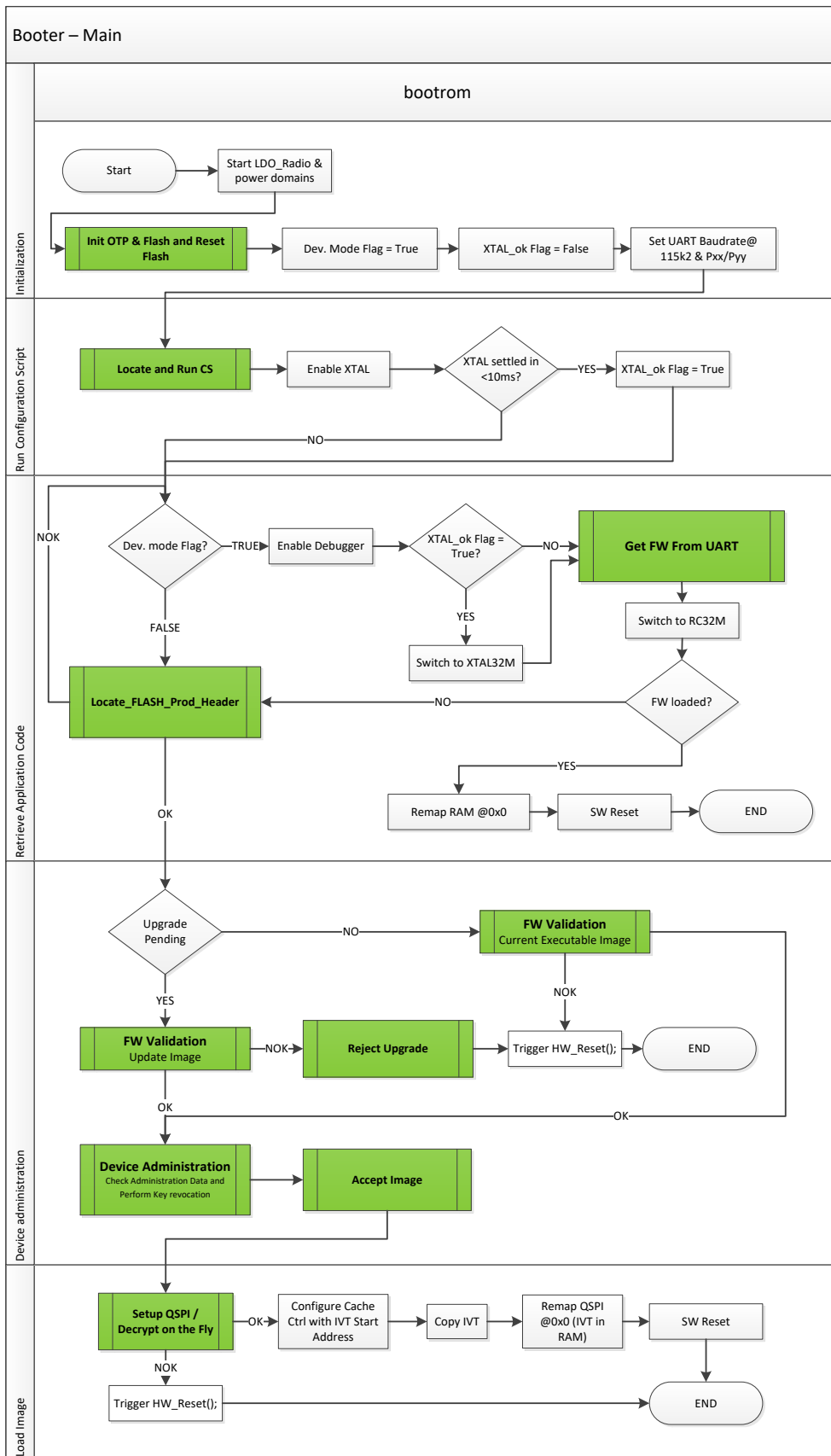


Figure 1: Main Boot Flow Phases

## 5 Retrieve Application Code

### 5.1 Code Retrieval Sequence

The procedure used by the ROM Booter to retrieve the firmware from the UART is described in [Figure 2](#).

### 5.2 Code Retrieval Protocol

The Booter ROM code uses the protocol defined in [Table 1](#). In the protocol the external host should wait to receive the STX byte and then initiate the programming sequence. The length is only two bytes. This limits the size of the bootable image to 64 kBytes.

**Table 1: UART Legacy Protocol (<64 kB)**

Byte #	1469x UTX	1469x URX
0	STX = 0x02	
1		SOH = 0x01
2		LEN_LSB
3		LEN_MSB
4	ACK = 0x06 or NACK = 0x15	
5...N		SW code bytes
N+1	CRC	
N+2		ACK

If the image is greater than 64 kBytes and less than 128 kBytes, the protocol described in [Table 2](#) should be used.

**Table 2: UART Extended Protocol**

Byte #	1469x UTX	1469x URX
0	STX = 0x02	
1		SOH = 0x01
2		0x00
3		0x00
4		LEN_LSB
5		LEN_MiddleSB
6		LEN_MSB
7	ACK = 0x06 or NACK = 0x15	
8...N		SW code bytes
N+1	CRC	
N+2		ACK

DA1469x Booting from Serial Interfaces

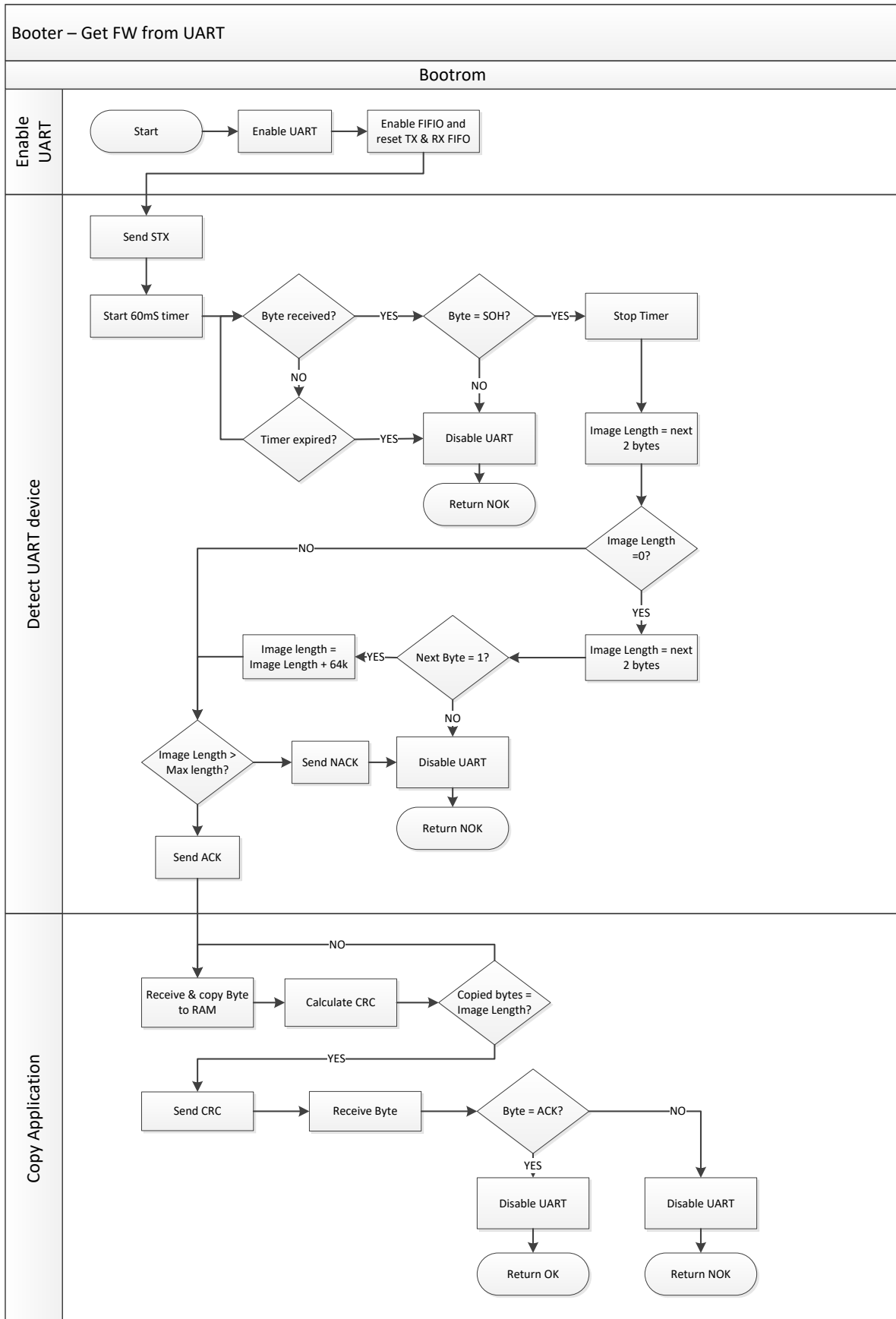


Figure 2: Get Firmware from UART

**Revision History**

<b>Revision</b>	<b>Date</b>	<b>Description</b>
1.1	20-Jan-2022	Updated logo, disclaimer, copyright.
1.0	14-Feb-2019	Initial version.



---

## DA1469x Booting from Serial Interfaces

### Status Definitions

Status	Definition
DRAFT	The content of this document is under review and subject to formal approval, which may result in modifications or additions.
APPROVED or unmarked	The content of this document has been approved for publication.