



Application Note: AZD026
Azoteq USB-dongles Overview

Contents

1	Azoteq USB-dongle usage	2
2	Azoteq USB-dongle pin-layout	3
3	Connecting USB-dongle for <i>Programming</i>	3
4	Connecting USB-dongle for <i>Serial Communication</i>	4
4.1	1-wire protocol.....	4
4.2	SPI.....	4
4.3	I ² C	5
5	Flash Programming (CT220/CT210 only)	5



1 Azoteq USB-dongle usage

The Azoteq USB-dongles available for commercial use are listed in Table 1-1. The dongles are connected to a computer via a mini-USB cable and are used:

- As an interface to program OTP¹ bits which is available on certain ICs (to customize an IC for a certain design), see table Table 3-1 for pin assignment or
- To perform serial communication between computer and IC via
 - 1-wire Communication Protocol see Table 4-1,
 - SPI see Table 4-2,
 - I²C see Table 4-3.

Azoteq provides software used for programming OTP bits. This software is known as USBProg and is intended for prototyping purposes. More information regarding USBProg can be found in application note AZD007.

Azoteq provides software used for the serial streaming of data to a computer utilising the Azoteq USB-dongles. This software is known as VisualProxSense and is intended for prototyping purposes. For some IQS ICs there exists a separate GUI. More information regarding the VisualProxSense application can be found in application note AZD006.

Table 1-1: Azoteq USB-dongles

Azoteq dongle	Description	Device Supported	Data Streaming	Programming
CT120 (EOL)	1 st Generation programmer and data streamer	IQS123	ONLY IQS123	X
CT200 (EOL)	2 nd Generation programmer and data streamer	ALL-Streaming	√*	IQS121, IQS127 _x , IQS128, IQS132, IQS133, IQS142, IQS143, IQS152, IQS156, IQS158, IQS221, IQS240, IQS904 _x
CT210	3 rd Generation programmer and data streamer	ALL	√*	√
DS100	Data Streaming Dongle	ALL	√*	X
RS100 ²	Wireless Data Streaming Dongle	ALL	√*	X
CT220 ³	3 rd Generation In-circuit production programmer and data streamer	ALL	√*	√

* Excludes IQS904_x

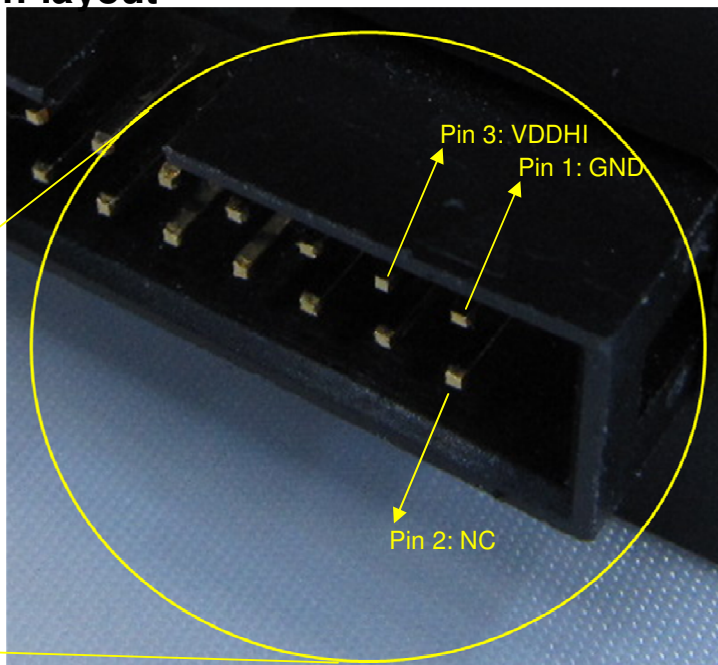
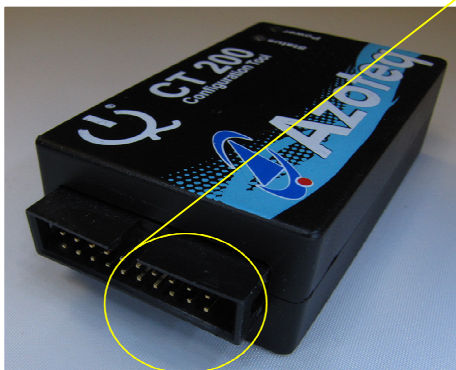
¹ One Time Programmable bit – Every bit is only programmable once

² To be used in conjunction with DS100, CT200, CT210 or CT220

³ The CT220 is intended to be used for applications such as in-circuit programming on a production line. For additional information and support, please contact ProxSenseSupport@azoteq.com.



2 Azoteq USB-dongle pin-layout



3 Connecting USB-dongle for Programming

Table 3-1: Azoteq USB-dongle pin assignment for programming

CT pin #	IQS127/128	IQS904	IQS240/221	IQS142/152	IQS132/133	IQS232/233	IQS242/252
1	V _{SS}	V _{SS}	V _{SS}	V _{SS}	V _{SS}	V _{SS}	V _{SS}
2							
3	V _{DDHI}	V _{DDHI}	V _{DDHI}	V _{DDHI}	V _{DDHI}	V _{DDHI}	V _{DDHI}
4			VDD				
5	SHLD/ POUT	LOAD	ZC			POUT/RF& RDY	PO0
6	Cx	Cx	MOSI				
7			SOMI	TO0/DATA	TO0/DATA	TO0/SDA	PO1
8			RDY				
9			SCK	PO1	TO1	TO1/SCL	TO1
10			/SS				

Only devices with OTP bits are shown



4 Connecting USB-dongle for *Serial Communication*

Please refer to the data sheet and communication interface of the specific device for information regarding the communication protocol supported.

4.1 1-wire protocol

USB-dongle pin #	Azoteq 1-wire device
1	V_{SS}
2	
3 ⁴	V_{DDHI}
4	
5	
6	
7	
8	
9	
10	DATA

Table 4-1: Azoteq USB-dongle pin assignment for 1-wire protocol

4.2 SPI

USB-dongle pin #	Azoteq SPI Device
1	V_{SS}
2	
3	V_{DDHI}
4	
5	
6	MOSI
7	SOMI
8	RDY
9	SCK
10	/SS

Table 4-2: Azoteq USB-dongle pin assignment for SPI

⁴ VDDHI can be supplied by an external source, please ensure the same voltage levels as USB-dongle are followed



4.3 I²C

USB-dongle pin #	Azoteq I ² C Device
1	V _{SS}
2	
3	V _{DDHI}
4	
5	
6	
7	SDA
8	
9	SCL
10	RDY

Table 4-3: Azoteq USB-dongle pin assignment for I²C

5 Flash Programming (CT220/CT210 only)

The CT210 supports a programming protocol used to program certain flash MCUs (e.g. IQS550, IQS643 & IQS659). The software used for this purpose is Azoteq Flash Programmer. The pinout to perform flash programming can be seen in Table 5-1.

CT pin #	Flash MCU
1	V _{SS}
2	
3	V _{DDHI}
..	
..	
..	
17	RESET
18	DATA
19	
20	

Table 5-1: Azoteq USB-dongle pin assignment for Flash Programming

**The following patents relate to the device or usage of the device:**

US 6,249,089 B1, US 6,621,225 B2, US 6,650,066 B2, US 6,952,084 B2, US 6,984,900 B1, US 7,084,526 B2, US 7,084,531 B2, US 7,119,459 B2, US 7,265,494 B2, US 7,291,940 B2, US 7,329,970 B2, US 7,336,037 B2, US 7,443,101 B2, US 7,466,040 B2, US 7,498,749 B2, US 7,528,508 B2, US 7,755,219 B2, US 7,772,781, US 7,781,980 B2, EP 1 120 018 B1, EP 1 206 168 B1, EP 1 308 913 B1, EP 1 530 178 B1, ZL 99 8 14357.X, AUS 761094

IQ Switch®, ProxSense®, AirButton® and the IQ Logo are trademarks of Azoteq

The information appearing in this Application Note is believed to be accurate at the time of publication. However, Azoteq assumes no responsibility arising from the use of the information. The applications mentioned herein are used solely for the purpose of illustration and Azoteq makes no warranty or representation that such applications will be suitable without further modification, nor recommends the use of its products for application that may present a risk to human life due to malfunction or otherwise. Azoteq products are not authorized for use as critical components in life support devices or systems. No licenses to patents are granted, implicitly or otherwise, under any intellectual property rights. Azoteq reserves the right to alter its products without prior notification. For the most up-to-date information, please contact ProxSenseSupport@azoteq.com or refer to the website : www.azoteq.com