Datasheet

ZDP03A, Z-Wave Development Platform

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1 ABBREVIATIONS

Abbreviation	Explanation
CLK	Clock
EEPROM	Electrical Erasable Programmable Read Only Memory
GND	Ground
GPIO	General Purpose Input/Output
HW	HardWare
INT	Interrrupt
IO	Input/Output
MISO	Master In Slave Out
MOSI	Master Out Slave In
N.C.	Not Connected
OEM	Original Equipment Manufacture
PWM	Pulse Width Modulator
RXD	Receive Data
SD3402	Z-Wave Single Chip, 4th generation
SPI	Serial Peripheral Interface
SW	SoftWare
TXD	Transmit Data
UART	Universal Asynchronous Receive/Transmit
ZM1206	6cm^2 Z-Wave Module based on ZW0102
ZM1220	20cm^2 Z-Wave Module based on ZW0102
ZM2102	2cm^2 Z-Wave Module based on ZW0201
ZM2106C	6cm^2 Z-Wave converter module for ZM2102
ZM2120C	20cm^2 Z-Wave converter module for ZM2102
ZM3102N	2cm^2 Z-Wave Module based on ZW0301
ZM3106C	6cm^2 Z-Wave converter module for ZM3102N
ZM3120C	20cm^2 Z-Wave converter module for ZM2102N
ZM4101	400 Series Z-Wave Single Chip SiP module
ZM4120C	20cm^2 Z-Wave converter module for ZM4102
ZM4125C	25cm^2 Z-Wave converter module for ZM4101
ZM4125C-S	25cm^2 Z-Wave converter module with Socket for ZM4101
ZM4225	25cm^2 Z-Wave Module based on SD3402
ZM4225S	25cm^2 Z-Wave Module with Socket based on SD3402
ZMxx06C	Converter module for 6cm^2 modules to 20cm^2 modules
ZW0102	Z-Wave Single Chip, 1st generation
ZW0201	Z-Wave Single Chip, 2nd generation
ZW0301	Z-Wave Single Chip, 3rd generation
ZDB3502	25 cm^2 Z-Wave development module based on SD3502
ZDB5101	25 cm^2 Z-Wave development module based on ZM5101
ZDB5202	20 cm^2 Z-Wave development module based on ZM5202
ZDB5304	25 cm^2 Z-Wave development module based on ZM5304

2 INTRODUCTION

2.1 Purpose

The purpose of this document is to describe the hardware features of the Z-Wave Development Platform ZDP03A. ZDP03A is the product name of the 3rd generation Z-Wave Development platform, and is included in the Developer's Kit.

Signal and component names within this document refer to the ZDP03A schematic [1] unless otherwise specified.

2.2 Audience and prerequisites

This document is for all Silicon Labs OEM customers, who use or intend to use the Z-Wave development platform in the design of Z-Wave products.

3 Z-WAVE DEVELOPMENT PLATFORM

This Z-Wave Development Platform, ZDP03A, is a part of the Z-Wave Developer's Kit. It is a hardware platform, which can be used in the development and maturation phase of Z-Wave product design. The ZDP03A is not designed for production environment.

The available interface connectors and user interfaces enable the development platform to support a wide range of functionalities.

The ZDP03A supports ZM2120C [3], ZM2106C [4] on ZMxx06 [2], ZM3120C [5], ZM3106C [6] on ZMxx06 [2], ZM4225 [7], ZM4125C [8], ZDB5202 [10], ZDB5304 [11], ZDB5101 [12] and ZDB3502 [13].

The Development Platform contains the following key components:

- ATmega128 microprocessor (U7)
- ATmega128 programming connector (J9)
- 2 DSUB 9 connectors (J12, J13)
- 2 USB connectors (J1, J18)
- ISP programming connector (J6)
- Z-Wave Development Board interface connectors (J14/J15)
- Reset button (U12)
- 12 LEDs (D1-D12) controlled by the Atmega128 and/or Z-Wave device
- 3 LED's (D15, D16, D17) indicating power on "USB", OTP programming voltage, and "Vcc supply"
- 6 push buttons (S1-S6).

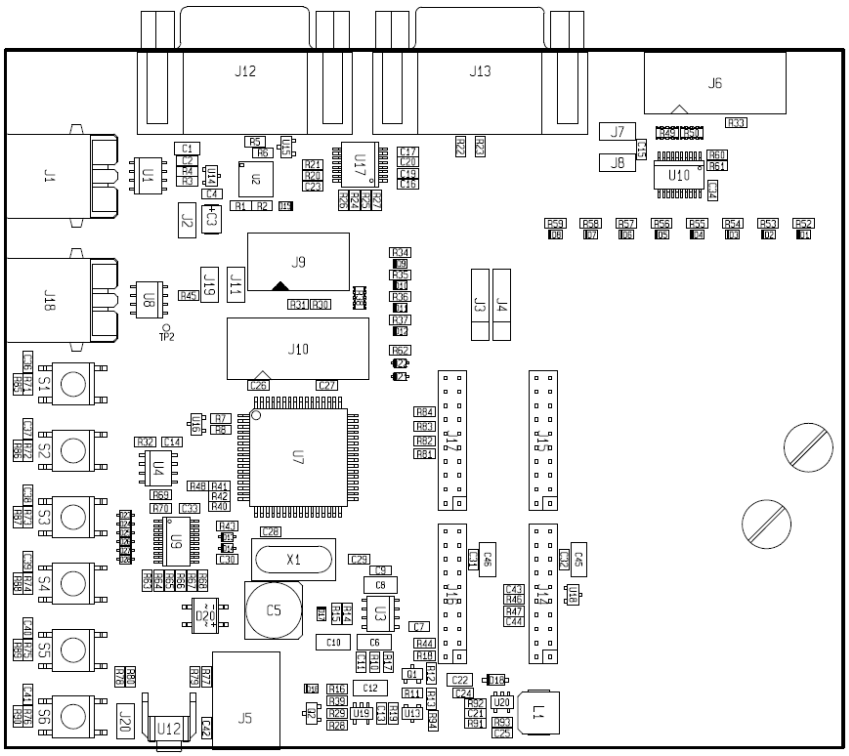

Figure 1: ZDP03A Z-Wave Development Platform

The following sections describe the HW features and interfaces of the Development Platform. All electrical signal names refer to the names in the schematic [1].

3.1 Interface Connectors J14, J15

One 200/300 series Z-Wave Module can be connected to the application connector J14. One 400 series Z-Wave module or a 500 series Z-Wave Development Board (ZDB) can be connected to application connectors J14 and J15.

J14 is used by 200/300 series based modules and is backward compatible with Z-Wave modules, [2], [3], [4], [5], and [6]. Both connectors, J14 and J15, are used when connecting one of the 400 series Z-Wave modules [7] and [8], or one of the 500 series ZDBs [10], [11], [12], and[13]. Connectors J16, J17 are used to access Z-Wave Module signals when connected to the interface connectors J14, J15.

J14, J15, J16, J17 are 2mm pitch 2x10 pin rows with the pin-out shown in Table 3.1.

Table 3.1: Application Connector signals

J14 / J16 Connector				J15 / J17 Connector			
Even Pin Name	**Even Pin**	**Odd Pin**	**Odd Pin Name**	**Even Pin Name**	**Even Pin**	**Odd Pin**	**Odd Pin Name**
ATMEL-PE7 PB-S6 PB6_APE7_ZWP3.4	20	19	ATMEL-PD6 APD6_P2.7	NC	20	19	NC
ATMEL-PD3 TXD0 APD3_ZWRXD0	18	17	VDD	TXD1 RXD1_ZW0401	18	17	ATMEL-PC7 APC7_ZWP0.0
ATMEL-PD2 RXD0 PB-S5 PB5_APD2_ZWTXD0	16	15	ATMEL-PB4 RESET_N_ZW	RXD1 TXD1_ZW0401	16	15	ATMEL-PC6 APC6_ZWP0.1
ATMEL-PD1 PB-S4 PB4_APD1_ZWMOSI1	14	13	GND	ATMEL-PA2 LED-D3 LED3_APA2_ZWP1.0	14	13	ATMEL-PC5 APC5_ZWP0.2
ATMEL-PD4 PB-S1 PB1_APD4_ZWSCK1	12	11	USB_DP	ATMEL-PA3 LED-D4 LED4_APA3_ZWP1.2	12	11	ATMEL-PC4 APC4_ZWP0.3
ATMEL-PD5 PB-S3 PB3_APD5_ZWMISO1	10	9	USB_DM	ATMEL-PA4 LED-D5 LED5_APA4_ZWP1.4	10	9	ATMEL-PF3 APF3_ZWP0.4
ATMEL-PB5 CS_ZW_EE_N	8	7	NC	ATMEL-PA5 LED-D6 LED6_APA5_ZWP1.5	8	7	ATMEL-PF2 APF2_ZWP0.5
ATMEL-PD0 APD0_ZWINT1	6	5	ATMEL-PE3 PB-S2 PB2_APE3_ZWTRIAC	ATMEL-PA6 LED-D7 LED7_APA6_ZWP1.6	6	5	ATMEL-PF1 APF1_ZWP0.6
ATMEL-PA0 LED-D1 LED1_APA0_ZWP1.6P0.7	4	3	ATMEL-PA1 LED-D2 LED2_APA1_ZWZEROX	ATMEL-PA7 LED-D8 LED8_APA7_ZWP1.7	4	3	ATMEL-PF0 APF0_ZWP1.3
APD7_PROG_N_VPP	2	1	VPP	GND	2	1	GND

1) ATMEL names refer to GPIO on Atmega128.
2) PB (Push Buttons) and LEDs refer to schematic part

The interface signals highlighted in gray are not connected to any circuitry on ZDP03A. A signal description is listed in Table 3.2.

Table 3.2: Application Connector J14/J15/J16/J17 Signal Description

Name	I/O	Description
ATMEL-PD0 ATMEL-PD6 ATMEL-PC7 ATMEL-PC6 ATMEL-PC5 ATMEL-PC4 ATMEL-PF3 ATMEL-PF2 ATMEL-PF1 ATMEL-PF0	I/O	ATmega128 IO's available on the application connector, and not connected to other circuitry on ZDP03A.
ATMEL-PA0 / LED1 ATMEL-PA1 / LED2 ATMEL-PA2 / LED3 ATMEL-PA3 / LED4 ATMEL-PA4 / LED5 ATMEL-PA5 / LED6 ATMEL-PA6 / LED7 ATMEL-PA7 / LED8	I/O	Atmega128 IO's available on the application connector and connected to LEDs D1 to D8 on ZDP03A.
VPP	Power	Programming voltage for 400 series modules. Not used on 200/300/500 Series Z-Wave devices
ATMEL-PD4 / PB1 / SCK1 ATMEL-PE3 / PB2 ATMEL-PD5 / PB3 / MISO1 ATMEL-PD1 / PB4 / MOSI1 ATMEL-PD2 / PB5 / RXD0 ATMEL-PE7 / PB6	I/O	Atmega128 IO's available on the application connector and connected to PBs P1 to P6 on ZDP03A. ATMEL-PD2 is also Atmega128 UART RXD0 interface. ATMEL-PD4, ATMEL-PD5, ATMEL-PD1 are also used as SPI interface to Z-Wave modules.
ATMEL-PB5 / CS	I/O	EEPROM chip select of the EEPPROM on Z-Wave module
ATMEL-PB4	I/O	Z-Wave active low Reset. Asserted by the ATmega128
ATMEL-PD3 / TXD0	I/O	Atmega128 IO's available on the application. ATMEL-PD3 is also Atmega128 UART TXD0 interface.
ZW_USB_DP ZW_USB_DM	I/O	USB interface available on application connector and connected to USB connector J18 on ZDP03A.
VDD	Power	3.3V power supply for Z-Wave module.
GND	Power	Ground
RXD1 TXD1	I/O	Z-Wave serial interface connected to J13

The Z-Wave Module is connected to the Development Platform Application Connector J14, J15 as shown in Figure 2.

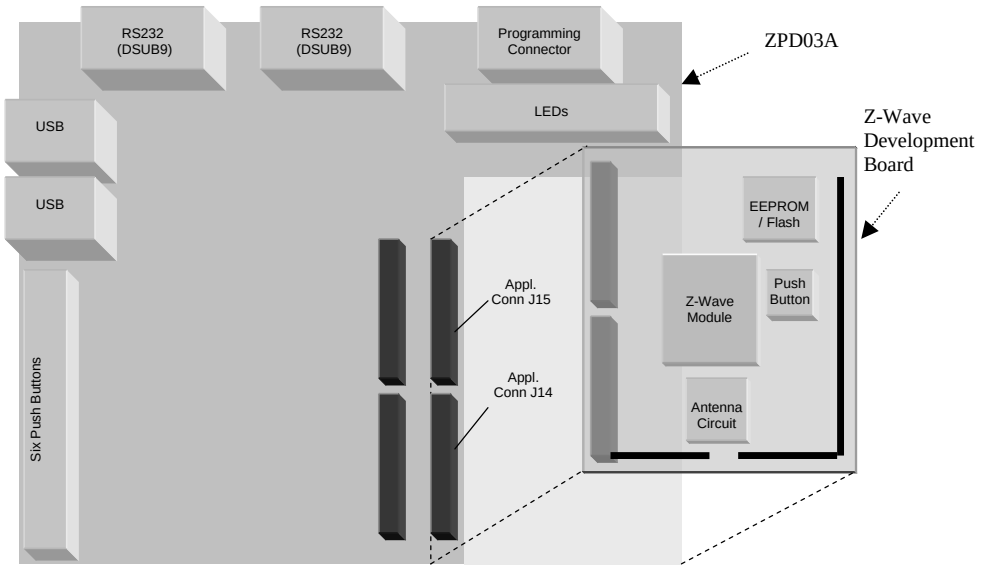

Figure 2: Z-Wave module connection

3.1.1 Z-Wave Module Interface Connectors

The range of Z-Wave modules to be connected to application connectors J14, J15 on ZDP03A have different IO mapping. The 200/300 series modules have 10 GPIOs and the 400/500 series modules have up to 30 GPIOs available on J14, J15. Table 3.3, Table 3.4, Table 3.5, Table 3.6 show the GPIO mapping on Z-Wave module interface connectors.

Table 3.3: ZM3120C Interface Connector Mapping to J14

	ZM3120C
J14 No.	**Pin Name**
1	NC
2	NC
3	P0.0-ADC0-ZEROX
4	P1.6-PWM-INT0
5	P0.1-ADC1-TRIAC
6	P1.7-INT1
7	NC
8	P1.5
9	NC
10	P1.2-MISO
11	NC
12	P1.4-SCK
13	GND
14	P1.3-MOSI
15	RESET_N
16	P1.0-ADC2-TXD
17	VDD
18	P1.1-ADC3-RXD
19	NC
20	NC

Table 3.4: ZM4125C-ZM4125C-S Interface Connector Mapping to J14, J15

	ZM4125C-ZM4125S		ZM4125C-ZM4125S
J14 No.	**Pin Name**	**J15 No.**	**Pin Name**
1	VPP	1	Ground
2	P2.6-MISO0	2	Ground
3	P3.7-PWM-ADC3-ZEROX-KEYPAD	3	P1.3-Keypad
4	P0.7-KEYPAD	4	P1.7-Keypad
5	P3.6-IRTX2-ADC2-TRIAC-KEYPAD	5	P0.6-Keyoad
6	P1.1-INT1-KEYPAD	6	P1.6-Keypad
7	P3.5-IRTX1-ADC1-KEYPAD	7	P0.5-Keypad
8	P2.5-MOSI0	8	P1.5-Keypad
9	USB_DM	9	P0.4-Keypad
10	P2.3-MISO1	10	P1.4-Keypad
11	USB_DP	11	P0.3-Keyoad
12	P2.4-SCK1	12	P1.2-Keypad
13	GND	13	P0.2-Keypad
14	P2.2-MOSI1	14	P1.0-INT0-Keypad
15	RESET_N	15	P0.1-Keypad
16	P2.1-TXD0	16	P3.1-IRRX-TXD1-Keypad
17	VDD	17	P0.0-Keypad
18	P2.0-RXD0	18	P3.0
19	P2.7-SCK0	19	NC
20	P3.4-IRTX0-ADC0-KEYPAD	20	NC

Table 3.5: ZM4225-ZM4225S Interface Connector Mapping to J14, J15

	ZM4225-ZM4225S		ZM4225-ZM4225S
J14 No.	**Pin Name**	**J15 No.**	**Pin Name**
1	VPP	1	Ground
2	NC	2	Ground
3	P3.7-PWM-ADC3-ZEROX-KEYPAD	3	P1.3-Keypad
4	P0.7-KEYPAD	4	P1.7-Keypad
5	P3.6-IRTX2-ADC2-TRIAC-KEYPAD	5	P0.6-Keyoad
6	P1.1-INT1-KEYPAD	6	P1.6-Keypad
7	P3.5-IRTX1-ADC1-KEYPAD	7	P0.5-Keypad
8	P2.5-MOSI0	8	P1.5-Keypad
9	USB_DM	9	P0.4-Keypad
10	P2.3-MISO1	10	P1.4-Keypad
11	USB_DP	11	NC
12	P2.4-SCK1	12	P1.2-Keypad
13	GND	13	NC
14	P2.2-MOSI1	14	P1.0-INT0-Keypad
15	RESET_N	15	NC
16	P2.1-TXD0	16	P3.1-IRRX-TXD1-Keypad
17	VDD	17	NC
18	P2.0-RXD0	18	NC
19	NC	19	NC
20	P3.4-IRTX0-ADC0-KEYPAD	20	NC

Table 3.6: ZM4120C Interface Connector Mapping to J14

	ZM4120C
J14 No.	**Pin Name**
1	VPP
2	NC
3	P3.7-ADC3-ZEROX
4	P1.0-PWM-INT0
5	P3.6-ADC2-TRIAC
6	P1.1-INT1
7	NC
8	P0.4
9	NC
10	P2.3-MISO1
11	NC
12	P2.4-SCK1
13	GND
14	P2.2-MOSI1
15	RESET_N
16	P3.5-ADC1-TXD0
17	VDD
18	P3.4-ADC0-RXD0
19	NC
20	NC

Table 3.7: ZDB5202 Interface Connector Mapping to J14

	ZDB5202
J14 No.	**Pin Name**
1	NC
2	NC
3	P3.7-ADC3-ZEROX
4	P1.0-PWM-INT0
5	P3.6-ADC2-TRIAC
6	P1.1-INT1
7	NC
8	P0.4
9	NC
10	P2.3-MISO
11	NC
12	P2.4-SCK
13	GND
14	P2.2-MOSI
15	RESET_N
16	P3.5-ADC1-TXD
17	VDD
18	P3.4-ADC0-RXD
19	NC
20	NC

Table 3.8: ZDB5304 Interface Connector Mapping to J14, J15

	ZDB5304		ZDB5304
J14 No.	**Pin Name**	**J15 No.**	**Pin Name**
1	NC	1	GND
2	NC	2	GND
3	NC	3	NC
4	NC	4	NC
5	NC	5	NC
6	NC	6	NC
7	NC	7	NC
8	NC	8	NC
9	USB_DM	9	NC
10	NC	10	NC
11	USB_DP	11	NC
12	NC	12	NC
13	GND	13	NC
14	NC	14	NC
15	RESET_N	15	NC
16	TXD0	16	NC
17	VDD	17	NC
18	RXD0	18	NC
19	NC	19	NC
20	NC	20	NC

Table 3.9: ZDB5101 Interface Connector Mapping to J14, J15

	ZDB5101		ZDB5101
J14 No.	**Pin Name**	**J15 No.**	**Pin Name**
1	NC	1	GND
2	P2.6-MISO0	2	GND
3	P3.7-PWM-ADC3-ZEROX-KEYPAD	3	P1.3-Keypad
4	P0.7-KEYPAD	4	P1.7-Keypad
5	P3.6-IRTX2-ADC2-TRIAC-KEYPAD	5	P0.6-Keyoad
6	P1.1-INT1-KEYPAD	6	P1.6-Keypad
7	P3.5-IRTX1-ADC1-KEYPAD	7	P0.5-Keypad
8	P2.5-MOSI0	8	P1.5-Keypad
9	USB_DM	9	P0.4-Keypad
10	P2.3-MISO1	10	P1.4-Keypad
11	USB_DP	11	P0.3-Keyoad
12	P2.4-SCK1	12	P1.2-Keypad
13	GND	13	P0.2-Keypad
14	P2.2-MOSI1	14	P1.0-INT0-Keypad
15	RESET_N	15	P0.1-Keypad
16	P2.1-TXD0	16	P3.1-IRRX-TXD1-Keypad
17	VDD	17	P0.0-Keypad
18	P2.0-RXD0	18	P3.0
19	P2.7-SCK0	19	NC
20	P3.4-IRTX0-ADC0-KEYPAD	20	NC

Table 3.10: ZDB3502 Interface Connector Mapping to J14, J15

	ZDB3502		ZDB3502
J14 No.	**Pin Name**	**J15 No.**	**Pin Name**
1	NC	1	GND
2	NC	2	GND
3	P3.7-PWM-ADC3-ZEROX-KEYPAD	3	P1.3-Keypad
4	P0.7-KEYPAD	4	P1.7-Keypad
5	P3.6-IRTX2-ADC2-TRIAC-KEYPAD	5	P0.6-Keyoad
6	P1.1-INT1-KEYPAD	6	P1.6-Keypad
7	P3.5-IRTX1-ADC1-KEYPAD	7	P0.5-Keypad
8	P2.5-MOSI0	8	P1.5-Keypad
9	USB_DM	9	P0.4-Keypad
10	P2.3-MISO1	10	P1.4-Keypad
11	USB_DP	11	NC
12	P2.4-SCK1	12	P1.2-Keypad
13	GND	13	NC
14	P2.2-MOSI1	14	P1.0-INT0-Keypad
15	RESET_N	15	NC
16	P2.1-TXD0	16	P3.1-IRRX-TXD1-Keypad
17	VDD	17	NC
18	P2.0-RXD0	18	NC
19	NC	19	NC
20	P3.4-IRTX0-ADC0-KEYPAD	20	NC

3.2 Programming Connector

The programming connector J6 is a standard 2x5 pin row (2.54mm pitch), which is compatible with the Equinox programming interface. This allows ZDP03A to work as a replacement for the Equinox programmer. The programming interface on J6 is a Serial Peripheral Interface (SPI) allowing high-speed synchronous data transfer between the ATmega128 and a Z-Wave module connected to J6. The EEPROM cannot be programmed from this interface because the chip select is not available.

The connector pin-out of J6 is listed in Table 3.11.

Table 3.11: Programming Connector, J2, Pin-out.

Name	Pin #	Description
SCK_ZW	8	SPI Clock.
GND	7, 9	Ground
MISO_ZW	6	Master In Slave Out SPI interface.
MOSI_ZW	4	Master Out Slave In SPI interface.
N.C.	3, 5	Not Connected.
VPP	2	Programming voltage required on 400 series Z-Wave modules. Must not be enabled on 200/300/500 series modules.
RESET_N_ZW	10	Active low Z-Wave Module reset. The reset circuitry on ZDP02A has an open collector output.
VDD	1	3.3V power supply

NOTE: The signals SCK_ZW, MISO_ZW, MOSI_ZW, VPP, RESET are connected both to the programming connector J6 and the application connector J14. Only one of the connector interfaces must be connected to a Z-Wave module to avoid driving conflict during programming.

3.3 Serial RS232 Interfaces

The RS232 interfaces can be used for connecting a PC to the serial interface on the Z-Wave module. The Connector is a standard female DSUB9 connector with the pin-out as shown in the table below.

Table 3.12: RS232 Connector, J5, Pin-out RS232 Connector, J5, Pin-out

Name	Pin #	Description
N.C.	1	Not connected
TXD	2	Transmit Data: connected to RXD on RS232 connector on PC.
RXD	3	Receive Data: connected to TXD on RS232 connector on PC.
N.C.	4	Not connected
GND	5	Signal Ground
N.C.	6,7,8,9	Not connected

The RS232_1 interface on J12 is connected directly to the UART on the 200/300 series, and the UART0 on the 400/500 series. Pins 3 and 4 must be shorted on J3 and J4 to provide this connection.

The RS232_2 interface on J13 is connected directly to the 400/500 series UART1 (if available).

3.4 USB Interfaces

The ZDP03A has two USB interfaces. The Connectors are a female type B USB connector with the pin-out as shown in Table 3.13.

Table 3.13: USB Connector, J0, Pin-out

Name	Pin #	Description
VBUS	1	USB Vbus power supply
D-	2	Negative differential signaling line
D+	3	Positive differential signaling line
GND	4	Ground

The USB interface available on J1 is connected to the Atmega128 UART via an USB to UART bridge (CP2102). Pins 1 and 2 must be shorted on J3 and J4 to provide the connection to the ATmega128. This USB interface is used during programming of Z-Wave modules. After the CP2102 device driver has been installed on the PC the USB interface works as a virtual COM port. The drivers are available on www.silabs.com.

The USB interface available on J18 is connected to the Z-Wave USB interface on 400/500 series only.

3.5 LED’s

The ZDP03A has 12 LED’s. The LEDs are connected to the Atmega128 and/or the Z-Wave application connectors. Table 3.14 shows the ATmega128 and Z-Wave GPIO connections to the LEDs:

Table 3.14: LED Control

LED#	ATmega pin no/name	Z-Wave 200/300	Z-Wave 400/500
D1	PA0	P1.6	P0.7
D2	PA1	P0.0	P3.7
D3	PA2		P1.0
D4	PA3		P1.2
D5	PA4		P1.4
D6	PA5		P1.5
D7	PA6		P1.6
D8	PA7		P1.7
D9 (A)	PC0		
D10 (B)	PC1		
D11 (C)	PC2		
D12 (D)	PC3		

The LED's are illuminating when the respective pins are driven low.

3.6 Push Buttons

The ZDP03A has 6 push buttons (excluding the reset push button), which are connected to the ATmega128 and/or the Z-Wave application connector. Table 3.15 shows how the ATmega128 and the Z-Wave GPIOs are connected to the push buttons on ZDP03A.

Table 3.15: GPIOs connected to push buttons

PB#	ATmega pin no/name	Z-Wave 200/300	Z-Wave 400/500
S1	PE2	P1.4	P2.4
S2	PE3	P0.1	P3.6
S3	PE4	P1.2	P2.3
S4	PE5	P1.3	P2.2
S5	PE6	P1.0	P2.1
S6	PE7		P3.4

The push buttons drives the inputs low when pressed.

3.7 ATmega128

The ATmega128 is an 8-bit microcontroller from Atmel. Its main features are 128Kbytes of In-System Programmable Flash with Read-While-Write capabilities, 53 programmable IOs, two UARTs, and a SPI interface. The ZDP03A is a multi-functional platform, which can be utilized to different tasks in the product development dependent on the SW image programmed to the ATmega128.

SW images can be stored in the ATmega128 128kB flash and in the 16kB EEPROM.

3.7.1 ATmega128 In System Programming

In system programming of the ATmega128 flash memory is supported by the programming interface accessible at connector J9. The connector pin out is specified in Table 3.16.

Table 3.16: ATmega Programming Connector, J9, pin out

Pin #	Pin Name
1	TXD
2	VDD
3	SCK
4	RXD
5	RESET_PB_N
6	GND

3.8 Reset

The ZDP03A has a RESET button U12, which both asserts the ATmega128 reset and Z-Wave reset.

J20 asserts reset of the ATmega128 if shorted. Reset is de-asserted when the jumper J20 is opened.

3.9 EEPROM

The ZDP03A has a mounting option for an Atmel AT25xxx EEPROM, U4, for additional memory space. The EEPROM is accessed via the SPI from the ATmega128.

3.10 Power Supply

The ZDP03A should be supplied from a DC supply connected to J1 with the specifications shown in Table 3.17.

Table 3.17: Power Adapter Specifications

Data	Description, External DC Supply
Input voltage	9VDC ± 0.5V
Power	>500mA
Connector	2.1mm power jack
Pole Polarization	No requirements

There are no requirements to the polarization of the power jack connector.

3.11 Jumper Selection

ZDP03A contains 7 jumpers. Refer to Table 3.18 for a configuration list of each jumper.

Table 3.18: Jumper Selection

Data	Description, Pin headers and jumpers
J3	RXD selection. Jumper mounted between: 1) Pin 1-2: Virtual COM port on USB1 connected to Atmega128 2) Pin 3-4: RS232_1 interface connected to Z-Wave appl. conn.
J4	TXD selection. Jumper mounted between: 1) Pin 1-2: Virtual COM port on USB1 connected to Atmega128 2) Pin 3-4: RS232_1 interface connected to Z-Wave appl. conn.
J7	Shorted: VPP applied to programming connector J6 pin #2. Open: Programming connector J6 pin #2 is not connected.
J8	Shorted: 3.3V applied to programming connector J6 pin #1. Open: Programming connector J6 pin #1 is not connected.
J11	Shorted: 3.3V applied to JTAG connector J10 pin #4. Open: JTAG connector J10 pin #4 is not connected.
J19	Shorted: USB2 indicates it is a ready full speed device Open: No USB device is available.
J20	Shorted: Atmega128 is kept in reset Open: Atmega128 reset is de-asserted

4 HW INTERFACE SPECIFICATIONS

4.1 Electrical Specification

4.1.1 Absolute Maximum Ratings

Table 4.1: Absolute Maximum Ratings

Electrical	Value
Operating Temperature	0°C to +70°C
Storage Temperature	-50°C to +105°C
Voltage on Application Connector	See datasheet for Z-Wave Module used.
DC Current per Application Connector signal Pin	See datasheet for Z-Wave Module used.
Voltages on RS232 interface with respect to Ground.	±25V
Voltages on USB interface with respect to Ground.	-0.3 to +5.8V.
Equinox programming connector (J6) when $V_{supply\ Atmega128}$ = 3.3V	-0.3V to +3.6V
ATmega128 programming connector (J9) when $V_{supply\ Atmega128}$ = 3.3V.	-0.5 to +3.8V
Maximum Voltage on external supply	+14V

4.1.2 DC Characteristics

Table 4.2 shows the typical power consumption of ZDP03A in some normal use cases.

Table 4.2: DC Characteristics

Parameter	Condition	Min	Typ	Max	Units
Power Supply, External Supply:					
Supply voltage		8.5	9.0	9.5	V
Voltage on application connector	See datasheet for Z-Wave Module used.				
DC Current per application Connector signal Pin	See datasheet for Z-Wave Module used.				
Icc, Power supply current	ZDP03A active, no LEDs on, no Z-Wave module connected		30		mA
Icc, Power supply current	ZDP03A active, 14 LEDs on, no Z-Wave module connected		55		mA
Icc, Power supply current	Programming of Z-Wave module with “Z-Wave programmer” SW.		45		mA

IOs signal characteristics are listed in Table 4.3.

Table 4.3: DC Characteristics

Parameter	Condition	Min	Typ	Max	Units
RS232 Transmitter Outputs					
Output voltage swing	All transmitter outputs loaded with 3kohm to GND	±5	±5.4		V
Output Leakage Current				±25	µA
Maximum Data Rate		120			kbps
Transmitter Output Resistance	VDD = 0V	300	10M		ohm
Output Short-Circuit Current	Vout = 0V		±35	±60	mA
RS232 Receiver Inputs					
RS-232 Input Voltage Operating Range		-25		25	V
RS-232 Input Threshold Low		0.6	1.2		V
RS-232 Input Threshold High			1.5	2.4	V
RS-232 Input Hysteresis			0.3		V
RS-232 Input Resistance		3	5	7	kohm
ATmega128 IO's					
Input voltage Low				0.66	V
Input voltage High		2.0			V
Output voltage Low	IOL = 10 mA, VDD = 3V			0.5	V
Output voltage High	IOH = -10 mA, VDD = 3V	2.4			V

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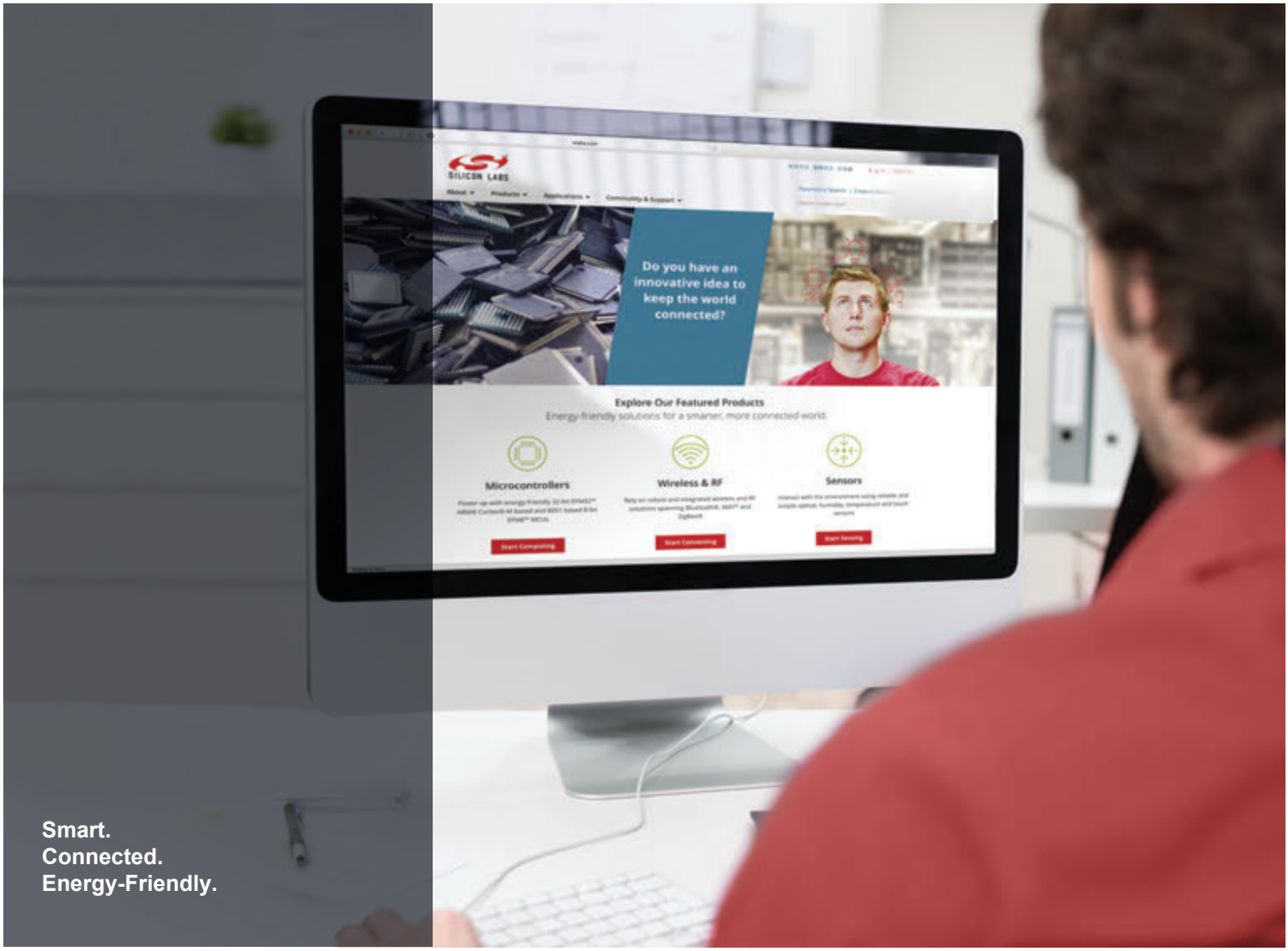

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