

devolo Green PHY eval board II



Data sheet

DESCRIPTION

This evaluation board is design for the dLAN® Green PHY Module and for the devolo Green PHY module V2. It provides PLC to a mains-line or to twisted pair connectors and gives the access to many of the available interfaces like Ethernet, USB, RS232 and more functionality on several pin headers.

The evaluation board provides two mikroBUS® slots for use with all he IO-modules available as CLICK® boards designed by Mikro Elektronika (<http://www.mikroe.com/click>).

SCOPE OF FUNCTIONALITY

The default functionality of the board is bridging from PLC to Ethernet. For all other kinds of applications and driving other interfaces or expansion slots specific firmware has to be adapted by means of the dLAN® Green PHY SDK.

FEATURES

- Evaluation board for dLAN® Green PHY Module and devolo Green PHY module V2
- PLC over mains-line or twisted pair connection
- Board is powered by mikro-USB-Connector
- Standard JTAG and serial debug ports
- PLC <-> Ethernet bridging
- Two expansion slots for mikroBUS® IO-Modules
- One General Purpose Port with digital or analog I/O

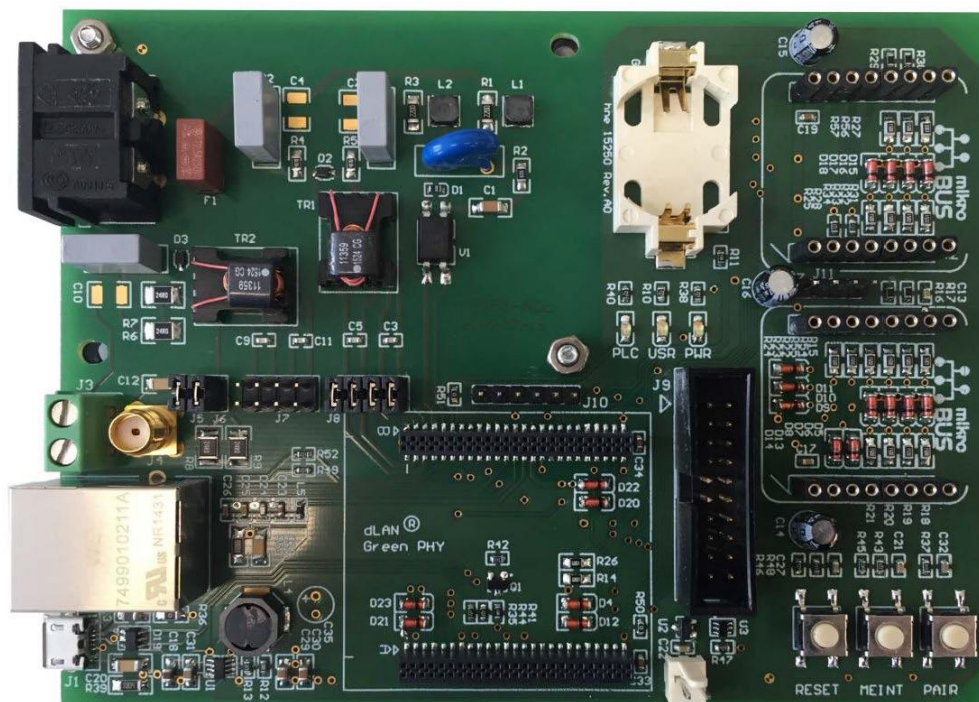


Fig 1: Picture of the devolo Green PHY eval board V2 (top view without cover)



Fig 2: Picture of the devolo Green PHY eval board II (side view)

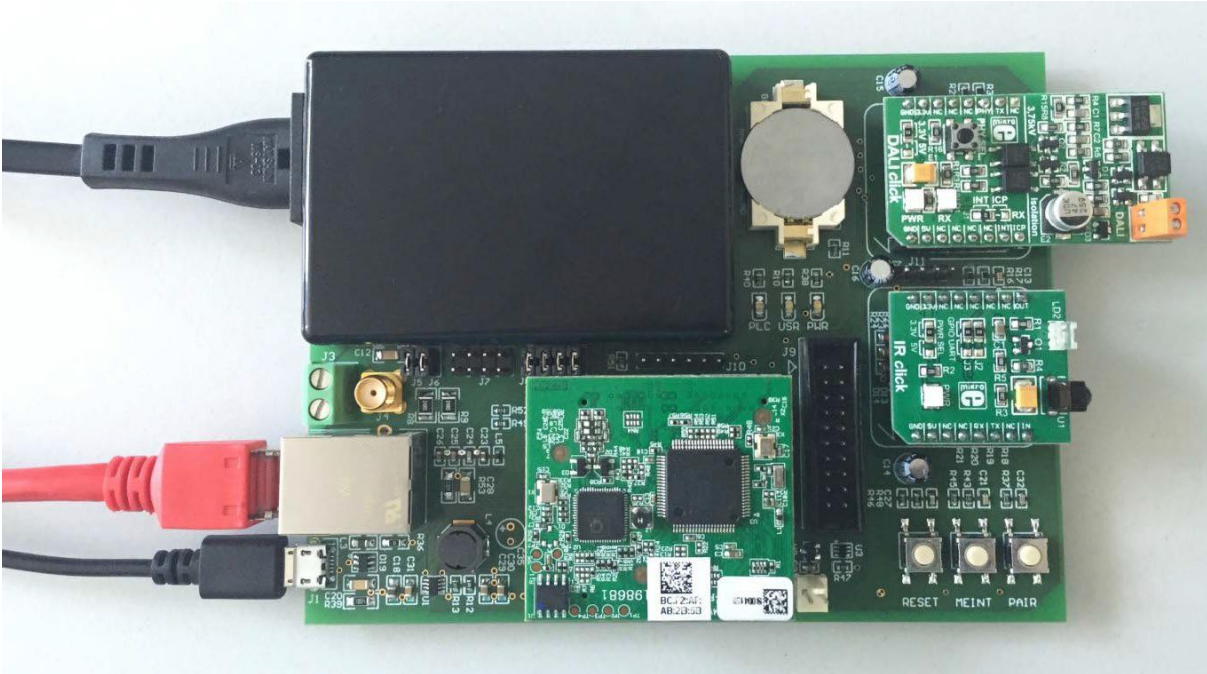


Fig 3: Picture of the devolo Green PHY eval board II (with modules and connected)

Contents

Contents	3
1 Introduction	4
2 Functionality of devolo Green PHY eval board II	5
2.1 Power Connector (Micro-USB) – J1	5
2.2 Fast Ethernet Connector (RJ45) – J2	5
2.3 PLC Interfaces – AC, 3, J4	5
2.4 UART0- Connector (1 6 Header) – J10*	5
2.5 JTAG Connector (2x10 Header) – J9*	5
2.6 Pushbuttons – MRES, MINT, PAIR	5
2.7 LEDs – PWR, USR, PLC	5
2.8 MikroBUS slots (2x8 Header) – M1, M2*	5
2.9 Two Wire Interface / I ² C (1x4 Header) – J11*	5
2.9 Two Wire Interface / I ² C (1x4 Header) – J11*	5
2.10 GPP Digital/Analog (1x3 Header) – J12*	5
2.11 Backup-battery 3V (optional) – G1.....	5
3 devolo Green PHY eval board V2 Pinout	6
3.1 J1 – Pin Names USB (Micro-USB)	6
3.2 J2 – Pin Names Ethernet 10/100 (RJ-45).....	7
3.3 J3 – Pin Names PLC Twisted Pair (2Screw Terminal).....	7
3.4 J4 – Pin Names PLC Coax (SMA female)	7
3.5 AC – Pin Names PLC AC-Line (C8P Connector).....	7
3.6 J9 – Pin Names LPC1758 JTAG Connector (ARM20)	8
3.7 J10 – Pin Names UART0 Debug Terminal (Header 1x6)	8
3.8 J11 – Pin Names I ² C (Header 1x4).....	8
3.9 J12 – Pin Names GPP (Header 1x3).....	9
3.10 M1, M2 – Pin Names mikroBUS Slots (Connector 2x8).....	9
3.11 dLAN® Green PHY Module – Row A Pin Names and Usage.....	10
3.12 dLAN® Green PHY Module – Row B Pin Names and Usage	12
3.13 devolo Green PHY module V2 – J1 pinout.....	15
3.14 devolo Green PHY module V2 – J2 pinout.....	16
4 devolo Green PHY eval board V2 Specifications	18
5 Revision History.....	18

1 Introduction

This data sheet gives you a short introduction in the major and most significant functions of this Evaluation Board. In this note acronyms are used for the whole Green PHY group like dLAN® Green PHY Module, devolo Green PHY module V2 (GPM) and for devolo Green PHY eval board II (GPE).

The LPC1758 is running FreeRTOS and supports only PLC <-> Ethernet bridging at time of delivery. Advise: For firmware update of the LPC1758, one of the following interfaces should be made accessible:

- ➔ JTAG (see LPC17xx user manual)
- ➔ UART0 (see LPC17xx user manual)
- ➔ Ethernet (see dLAN@ Green PHY SDK manual)

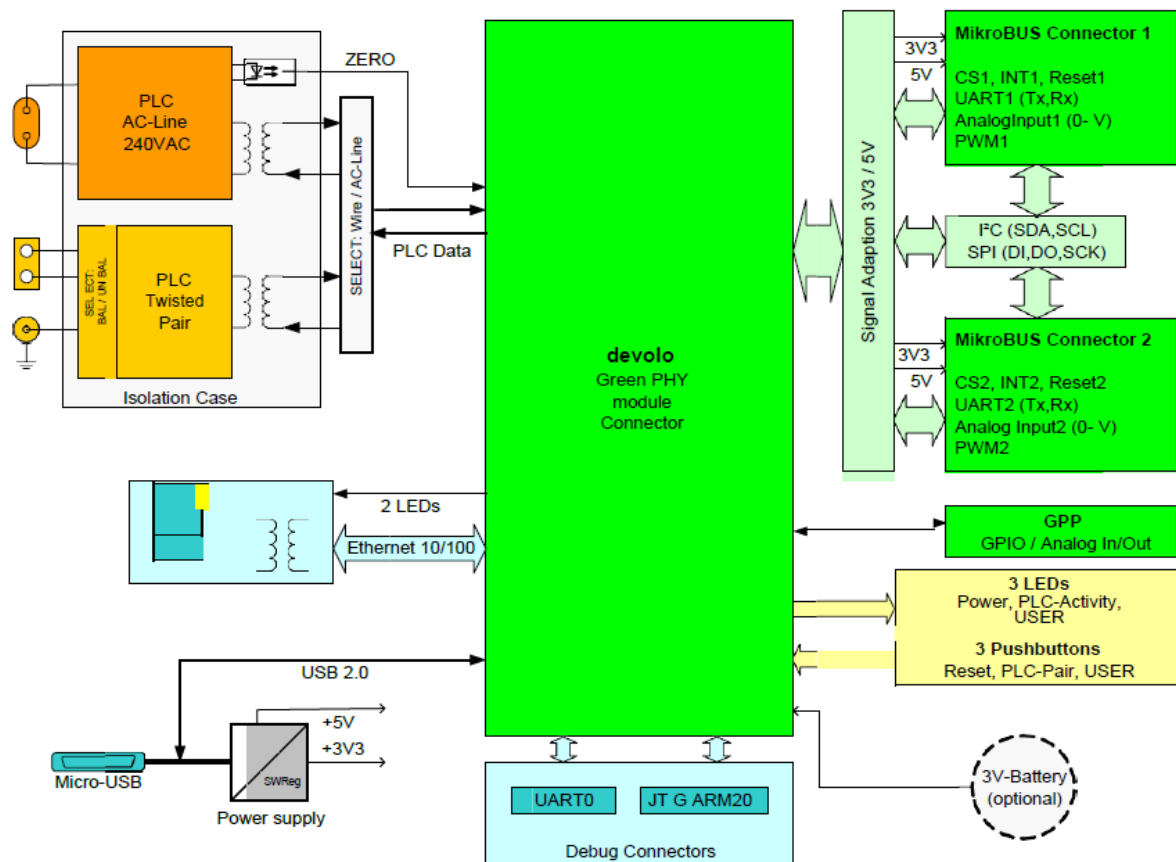


Fig 4: Block Diagram of the devolo Green PHY eval board II

2 Functionality of devolo Green PHY eval board II

This GPEB offers several interfaces connected to the pins of the GPM.

2.1 Power Connector (Micro-USB) – J1

Power Supply for the EVAL Board is provided by this Connector. Additional USB 2.0 Pins are connected to GPM's USB port and can be used if supported by special Software.

2.2 Fast Ethernet Connector (RJ45) – J2

Fast Ethernet RJ45 connector with integrated magnetics

2.3 PLC Interfaces – AC, 3, J4

Power Line Communication interfaces are provided for AC-Line or of twisted pair lines. AC-Line or twisted pair is selected alternatively by a jumper area (J8/J7). When twisted pair inputs are selected, you can choose between Screw-Terminal (J3) or a SM Coaxial-Connector (J4). AC-PLC-Circuits are protected by an isolation case.

2.4 UART0- Connector (1 6 Header) – J10*

This connector can be used for Command-Line-Interface or just to get debug messages. Programming the internal flash of the LPC1758 processor on the GPM (ISP-in circuit programming) is possible with special utilities. Pinout fits to standard FTDI USB-cable (3.3V-type).

2.5 JTAG Connector (2x10 Header) – J9*

LPC1758 JTAG Interface with standard ARM20 pinout.

2.6 Pushbuttons – MRES, MINT, PAIR

Pushbutton PAIR is connected to GPIO3 of the QCA7000.
Default mode: initiate pairing mechanism.
MRES (manually Reset) initiates Hardware Reset circuitry,
MINT (manually Interrupt) is free for user demands.

2.7 LEDs – PWR, USR, PLC

PWR-LED (green) is connected to output of 3V3 switching regulator.
PLC-LED (green) reserved for signaling Power Line Communication activities.
USR-LED (yellow) is connected to an LPC port and free for user demands.

2.8 MikroBUS slots (2x8 Header) – M1, M2*

Dual mikroBUS slot provide several communication lines and ports like TX, RX, SPI and TWI (I²C)
Many ready designed IO-modules using mikroBUS-layout are available from Mikro elektronika (www.mikroe.com/click) and other partners.

2.9 Two Wire Interface / I²C (1x4 Header) – J11*

Separate connector with access to 3V3 power supply and I²C Interface lines.

2.9 Two Wire Interface / I²C (1x4 Header) – J11*

Separate connector with access to 3V3 power supply and I²C Interface lines.

2.10 GPP Digital/Analog (1x3 Header) – J12*

General Purpose Port: GPIO, A/D and D/A, access to LPC1758 Port [26].

2.11 Backup-battery 3V (optional) – G1

Optional VBAT supply for LPC1758's internal standby circuits and RTC.

*** only in combination with dLAN Green PHY module (V1)**

3 devolo Green PHY eval board V2 Pinout

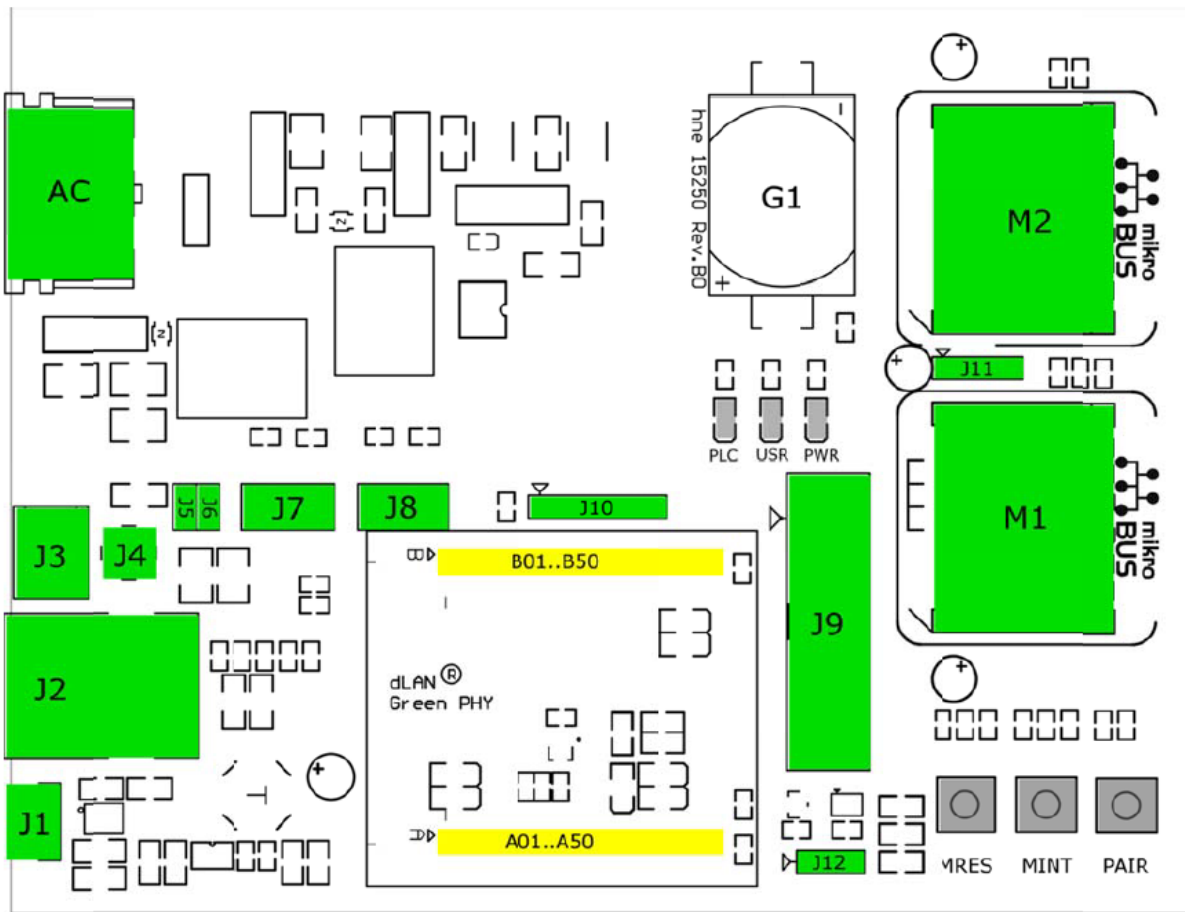


Fig 5: Top Assembly connectors marked

3.1 J1 – Pin Names USB (Micro-USB)

Pin No.	Pin Name	Type	USB Function
1	VUSB	P	VCC: +5V, 1A max
2	D-	I/O	USB D- connected to LPC1758 DM
3	D+	I/O	USB D+ connected to LPC1758 DP
4	A/B	NC	Not Connected
5	GND	P	Ground: 0 V reference
S	Shield	S	Shield: connected to GND with 1nF//1M

3.2 J2 – Pin Names Ethernet 10/100 (RJ-45)

Pin No.	Pin Name	Type	Ethernet Function
1	TX+	I/O	TX+
2	TX-	I/O	TX-
3	RX+	I/O	RX+
4		I/O	BIAS TX
5		I/O	
6	RX-	I/O	RX-
7		I/O	BIAS RX
8		I/O	
S	Shield	S	Shield: connected to GND with 1nF//1M

3.3 J3 – Pin Names PLC Twisted Pair (2Screw Terminal)

Pin No.	Pin Name	Type	PLC Function	Jumpers J7.1-J7.4 closed Jumpers J8.1-J8.4 open!
1	PLC+	I/O	PLC+ Impedance 100Ω	J6 open
2	PLC-	I/O	PLC- balanced	J5 open

3.4 J4 – Pin Names PLC Coax (SMA female)

Pin No.	Pin Name	Type	PLC Function	Jumpers J7.1-J7.4 closed Jumpers J8.1-J8.4 open!
1	PLC+	I/O	PLC+ Impedance 50Ω	J6 closed
2	PLC-	I/O	PLC- 1nF to GND	J5 closed

3.5 AC – Pin Names PLC AC-Line (C8P Connector)

Pin No.	Pin Name	Type	PLC Function	Jumpers J7.1-J7.4 closed Jumpers J8.1-J8.4 open!
1	AC	I/O	240 VAC	
2	AC	I/O	240 VAC this line is fused with 2A	

3.6 J9 – Pin Names LPC1758 JTAG Connector (ARM20)

Pin No.	Pin Name	Type	JTAG Function
1	3V3	P	+3.3V supply voltage
2	3V3	P	+3.3V supply voltage
3	TRST_N	I	TRST — Test Reset# for JTAG interface
4	GND	P	Ground: 0V reference
5	TDI	I	TDI: Test Data In for JTAG interface
6	GND	P	Ground: 0V reference
7	TMS/SWDIO	I	TMS/ Test Mode Select for JTAG interface
		I/O	SWDIO: Serial Wire Debug Data Input/Output
8	GND	P	Ground: 0V reference
9	TCK/SWDCLK	I	TCK/ Test Clock for JTAG interface
		I	SWDCLK: Serial wire clock
10	GND	P	Ground: 0V reference
11	RTCK	O	RTCK: Return Test Clock for JTAG interface Not supported, connected to GND over 10kΩ
12	GND	P	Ground: 0V reference
13	TDO/SWO	O	TDO/ Test Data Out for JTAG interface
		O	SWO: Serial Wire trace Output
14	GND	P	Ground: 0V reference
15	SRST_N	OD	SRST: System Reset#
16	GND	P	Ground: 0V reference
17	NC	NC	Not connected
18	GND	P	Ground: 0V reference
19	NC	NC	Not connected
20	GND	P	Ground: 0V reference

3.7 J10 – Pin Names UART0 Debug Terminal (Header 1x6)

Pin No.	Pin Name	Type	UART Function
1	GND	P	Ground: 0V reference
2	CTS	O	Connected to RTS via R51
3	3V3	P	+3.3V supply voltage for FTDI Cable (3.3V Type)
4	TXD	I	Connected to UART0 RXD
5	RXD	O	Connected to UART0 TXD
6	RTS	I	Connected to CTS via R51

3.8 J11 – Pin Names I²C (Header 1x4)

Pin No.	Pin Name	Type	I ² C Function
1	GND	P	Ground: 0V reference
2	3V3	O	+3.3V supply voltage
3	SDA	I/O	SDA: I ² C Data line
4	SCL	I/O	SCL: I ² C Clock line

3.9 J12 – Pin Names GPP (Header 1x3)

Pin No.	Pin Name	Type	I ² C Function
1	GND	P	Ground: 0V reference
2	GPP	I/O	GPIO / Analog-In/Out: connected to Port P0[26]
3	3V3	P	+3.3V supply voltage

3.10 M1, M2 – Pin Names mikroBUS Slots (Connector 2x8)

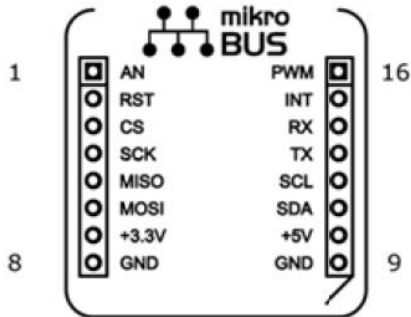


Fig 6: mikroBUS Port pin count

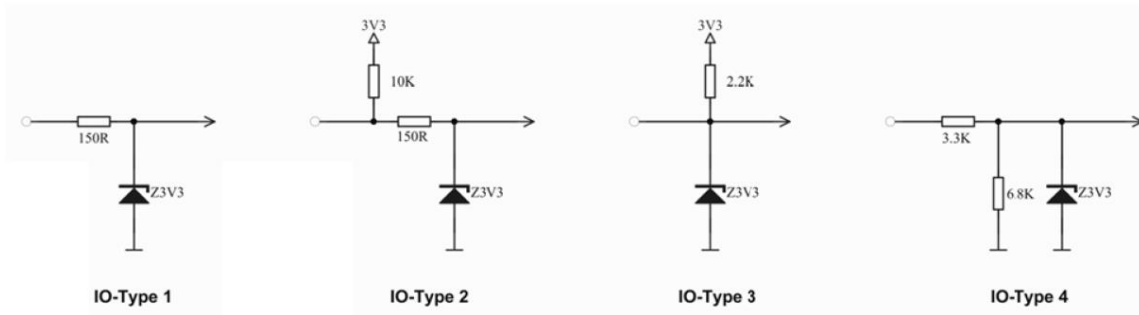


Fig 7.1 - 7.4: mikroBUS Port internal Connection Types

Pin No.	Pin Name	IO-Type	mikroBUS Function	Ports for M1	Ports for M2
1	AN	I-4	Analog Port: 0..5V	Port 1 [31]	Port 0 [25]
2	RSTS	O-2	Reset# Pin	Port 1 [26]	Port 1 [28]
3	CS	O-2	SPI Chip Select#	Port 2 [02]	Port 2 [07]
4	SCK	O-1	SPI Clock Line	Port 0 [07]	
5	MISO	I-1	SPI Master Input	Port 0 [08]	
6	MOSI	O-1	SPI Master Output	Port 0 [09]	
7	+3.3V	P	+3.3V supply voltage		
8	GND	P	Ground: 0V reference		
9	GND	P	Ground: 0V reference		
10	+5V	P	+5.0V supply voltage		
11	SDA	I/O-3	I ² C Data Line	Port 0 [00]	
12	SCL	O-3	I ² C Clock Line	Port 0 [01]	
13	TX	O-1	UART Transmit	Port 2 [00]	Port 0 [10]
14	RX	I-1	UART Receive	Port 2 [01]	Port 0 [11]
15	INT	I-1	Interrupt# Input	Port 2 [03]	Port 2 [06]
16	PWM	O-1	PWM Ouput	Port 2 [04]	Port 2 [05]

3.11 dLAN® Green PHY Module – Row A Pin Names and Usage

Pin No.	Pin Name	Type	Function on Module	Used on Eval as...
1	GND	P	Ground: 0V reference	
2	VDD	P	+3.3V supply voltage	
3	P0[11] / RXD2 / SCL2 / MAT3[1]	I/O I I/O O	P0[11] – General purpose digital input/output pin RXD2 – Receiver input for UART2 SCL2 – I2C2 clock input/output MAT3[1] – Match output for Timer 3, channel 1	M2: RX
4	P0[10] / TXD2 / SDA2 / MAT3[0]	I/O O I/O O	P0[10] – General purpose digital input/output pin TXD2 – Transmitter output for UART2 SDA2 – I2C2 data input/output MAT3[0] – Match output for Timer 3, channel 0	M2: TX
5	P2[2] / PWM1[3] / CTS1 / TRACEDATA[3]	I/O O I O	P2[2] – General purpose digital input/output pin PWM1[3] – Pulse Width Modulator 1, channel 3 CTS1 – Clear to Send input for UART1 TRACEDATA[3] – Trace data, bit 3	M1: CS#
6	P2[7] / RD2 / RTS1	I/O I O	P2[7] – General purpose digital input/output pin RD2 – CAN2 receiver input RTS1 – Request to Send output for UART1	M2: CS#
7	P2[4] / PWM1[5] / DSR1 / TRACEDATA[1]	I/O O I O	P2[4] – General purpose digital input/output pin PWM1[5] – Pulse Width Modulator 1, channel 5 DSR1 – Data Set Ready input for UART1 TRACEDATA[1] – Trace data, bit 3	M2: PWM
8	P2[5] / PWM1[6] / DTR1 / TRACEDATA[0]	I/O O O O	P2[5] – General purpose digital input/output pin PWM1[6] – Pulse Width Modulator 1, channel 6 DTR1 – Data Terminal Ready output for UART1 TRACEDATA[0] – Trace data, bit 0	M2: PWM
9	P2[3] / PWM1[4] / DCD1 / TRACEDATA[2]	I/O O I O	P2[3] – General purpose digital input/output pin PWM1[4] – Pulse Width Modulator 1, channel 4 DCD1 – Data Carrier Detect input for UART1 TRACEDATA[2] – Trace data, bit 2	M1: INT#
10	P2[6] / PCAP1[0] / RI1 / TRACECLK	I/O I I O	P2[6] – General purpose digital input/output pin PCAP1[0] – Capture input for PWM1, channel 0 RI1 – Ring Indicator input for UART1 TRACECLK – Trace Clock	M2: INT#

Pin No.	Pin Name	Type	Function on Module	Used on Eval as...
11	P2[1] / PWM1[2] / RXD1	I/O O O	P2[1] – General purpose digital input/output pin PWM1[2] – Pulse Width Modulator 1, channel 2 RXD1 – Receiver input for UART1	M1: RX
12	P2[0] / PWM1[1] / TXD1	I/O O O	P2[0] – General purpose digital input/output pin PWM1[1] – Pulse Width Modulator 1, channel 1 TXD1 – Transmitter output for UART1	M1: TX
13	GND	P	Ground: 0V reference	
14	VDD	P	+3.3V supply voltage	
15	GND	P	Ground: 0V reference	
16	P1[30] / V _{Bus} / AD0[4]	I/O I I	P1[30] – General purpose digital input/output pin V_{Bus} – Monitors the presence of USB buspower Note: This signal must be HIGH for USB reset AD0[4] – A/D converter 0, input 4	USB: VBUS
17	P1[19] / MCOA0 / nUSB_PPWR / CAP1[1]	I/O O O I	P1[19] – General purpose digital input/output pin MCOA0 – Motor control PWM channel 0A nUSB_PPWR – Port Power enable for USB port CAP1[1] – Capture input for Timer 1, channel 1	
18	P1[22] / MCOB0 / USB_PWRD / MAT1[0]	I/O O I O	P1[22] – General purpose digital input/output pin MCOB0 – Motor control PWM channel 0B USB_PWRD – Power Status for USB port MAT1[0] – Match output for Timer 1, channel 0	
19	P2[9] / USB_CONN / RXD2	I/O O I	P2[9] – General purpose digital input/output pin USB_CONNECT – Signal used to switch an external 1.5k _Ω resistor under software control. Used with the SoftConnect USB feature. RXD2 – Receiver input for UART2	USB: MODE
20	P0[30] / USB_D-	I/O I/O	P0[30] – General purpose digital input/output pin USB_D- – USB bidirectional D- line. A 330Ω resistor in series is integrated on Module	USB: DN
21	P1[18] / USB_UP_LED / PWM1[1] / CAP1[0]	I/O O O I	P1[18] – General purpose digital input/output pin USB_UP_LED – USB GoodLink LED indicator PWM1[1] – Pulse Width Modulator 1, channel 1 CAP1[0] – Capture input for Timer 1, channel 0	
22	P0[29] / USB_D+	I/O I/O	P0[29] – General purpose digital input/output pin USB_D+ – USB bidirectional D+ line. A 330Ω resistor in series is integrated on Module	USB: DP
23	GND	P	Ground: 0V reference	
24	VDD	P	+3.3V supply voltage	
25	P1[25] / MCOA1 / MAT1[1]		P1[25] – General purpose digital input/output pin MCOA1 – Motor control PWM channel 1A MAT1[1] – Match output for Timer 1, channel 1	
26	RSVD		Reserved, do not connect	
27	RSVD		Reserved, do not connect	
28	RSVD		Reserved, do not connect	
29	RSVD		Reserved, do not connect	
30	RSVD		Reserved, do not connect	
31	RSVD		Reserved, do not connect	
32	RSVD		Reserved, do not connect	
33	RSVD		Reserved, do not connect	
34	RSVD		Reserved, do not connect	
35	RSVD		Reserved, do not connect	
36	RSVD		Reserved, do not connect	
37	GND	P	Ground: 0V reference	
38	VDD	P	+3.3V supply voltage	

Pin No.	Pin Name	Type	Function on Module	Used on Eval as...
39	P0[26] /	I/O	P0[26] – General purpose digital input/output pin. When configured as an ADC input or DAC output, the digital section of the pad is disabled.	GPP: General Purpose Port Digital / Analog (J12)
	AD0[3] /	I	AD0[3] – A/D converter 0, input 3	
	AOUT /	O	AOUT – D/A converter output	
	RXD3	I	RXD3 – Receiver input for UART3	
40	P1[31] /	I/O	P1[31] – General purpose digital input/output pin. When configured as an ADC input digital section of the pad is disabled.	M1: AN
	SCK1 /	I/O	SCK1 – Serial Clock for SSP1	
42	AD0[5]	I	AD0[5] – A/D converter 0, input 5	M2: AN
	P0[25] /	I/O	P0[25] – General purpose digital input/output pin. When configured as an ADC input digital section of the pad is disabled.	
	AD0[2] /	I	AD0[2] – A/D converter 0, input 2	
	I2RX_SDA /	I/O	I2RX_SDA – Receive data	
	TXD3	O	TXD3 – Transmitter output for UART3	
43	TDI	I	TDI – Test Data in for JTAG interface	JTAG: TDI
44	VDD	P	+3.3V supply voltage	
45	TMS /	I	TMS – Test Mode Select for JTAG interface	JTAG: TMS
	SWDIO	I/O	SWDIO – Serial wire debug data input/output	
46	TDO /	O	TDO – Test Data out for JTAG interface	JTAG: TDO
	SWO	O	SWO – Serial wire trace output	
47	TCK /	I	TCK – Test Clock for JTAG interface	JTAG: TCK
	SWDCLK	I	SWDCLK – Serial wire clock	
48	nTRST	I	nTRST – Test Reset for JTAG interface	JTAG: TRST#
49	GND	P	Ground: 0V reference	
50	VDD	P	+3.3V supply voltage	

3.12 dLAN® Green PHY Module – Row B Pin Names and Usage

Pin No.	Pin Name	Type	Function on Module	Used on Eval as...
1	GND	P	Ground: 0V reference	
2	GND	P	Ground: 0V reference	
3	G-PHY_RXP	I	RXP – PLC Positive differential input	PLC: RX+
4	G-PHY_TXP	O	TXP – PLC Positive differential output	PLC: TX+
5	G-PHY_RXN	I	RNP – PLC Negative differential input	PLC: RX-
6	G-PHY_TXN	I	TXN – PLC Negative differential output	PLC: TX-
7	GND	P	Ground: 0V reference	
8	GND	P	Ground: 0V reference	
9	G-PHY_ZC_IN	I	ZC_IN – Zero Cross Input	PLC: Zero Crossing
10	RSVD		Reserved, do not connect	
11	G-PHY_GPIO[0]	I/O	GPIO 0 – Sets mode at power on, then becomes I/O	PLC: Activity-LED#
12	G-PHY_GPIO[1]	I/O	GPIO 1 – Sets mode at power on, then becomes I/O	
13	G-PHY_GPIO[2]	I/O	GPIO 2 – Sets mode at power on, then becomes I/O	
14	G-PHY_GPIO[3]	I/O	GPIO 3 – Sets mode at power on, then becomes I/O	Button: PAIR
15	RSVD		Reserved, do not connect	
16	RSVD		Reserved, do not connect	
17	RSVD		Reserved, do not connect	

Pin No.	Pin Name	Type	Function on Module	Used on Eval as...
18	RSVD		Reserved, do not connect	
19	VDD	P	+3.3V supply voltage	
20	GND	P	Ground: 0V reference	
21	VDD	P	+3.3V supply voltage	
22	GND	P	Ground: 0V reference	
23	ETH_TXP	I/O	TXP – Ethernet Transmit Positive Channel	ETH: TDP
24	ETH_RXP	I/O	RXP – Ethernet Receive Positive Channel	ETH: RXP
25	ETH_TNP	I/O	TXN – Ethernet Transmit Negative Channel	ETH: TDN
26	ETH_RXN	I/O	RXP – Ethernet Receive Negative Channel	ETH: RXN
27	ETH_VDDCTX	O	VDDCTX – Ethernet XFMR CTX (Common Tap) Power supply	ETH: CT Bias
28	ETH_VDDCTX	O	VDDCTX – Ethernet XFMR CTX (Common Tap) Power supply	ETH: CT Bias
29	VDD	P	+3.3V supply voltage	
30	GND	P	Ground: 0V reference	
31	ETH_LED1	O	LED1 – Sets mode at power on the becomes Ethernet Link/Activity LED indication (active High)	ETH: LED1
32	ETH_LED2	O	LED2 – Sets mode at power on the becomes Ethernet Link Speed LED indication (active Low) 100 = on, 10 = off	ETH: LED1
33	P2[10] /	I/O	P2[10] – General purpose digital input/output pin. 5V tolerant pad with 5ns glitch filter providing digital I/O functions with TLL levels and hysteresis. Note: A LOW on this pin while RESET is LOW forces the on-chip bootloader to take over control of the part after reset and go into ISP mode. See LPC17xx user manual Section 32.1 for details.	Button: MINT
	nEINT0 / NMI	I I	nEINT0 – External interrupt 0 input NMI – Non maskable interrupt input	
34	RSVD		Reserved, do not connect	
35	P0[2] /	I/O	P0[2] – General purpose digital input/output pin. When configured as an ADC input digital section of the pad is disabled.	UART0: TXD
	TXD0 / AD0[7]	O I	TXD0 – Transmitter output for UART0 AD0[7] – A/D converter 0, input 7	
36	P0[3] /	I/O	P0[3] – General purpose digital input/output pin. When configured as an ADC input digital section of the pad is disabled.	UART0: RXD
	RXD0 / AD0[6]	I I	RXD0 – Receiver input for UART0 AD0[6] – A/D converter 0, input 6	
37	P0[8] /	I/O	P0[8] – General purpose digital input/output pin.	SPI: MISO
	I2STX_WS /	I/O	I2STX_WS – Transmit Word Select	
	MISO1 / MAT2[2]	I/O O	MISO1 – Master In Slave Out for SSP1 MAT2[2] – Match output for Timer 2, channel 2	
38	P0[9] /	I/O	P0[9] – General purpose digital input/output pin.	SPI: MOSI
	I2STX_SDA /	I/O	I2STX_SDA – Transmit Data	
	MOSI1 / MAT2[3]	I/O O	MOSI1 – Master Out Slave In for SSP1 MAT2[3] – Match output for Timer 2, channel 3	
39	P0[6] /	I/O	P0[6] – General purpose digital input/output pin.	USR: UserLED#
	I2SRX_SDA /	I/O	I2SRX_SDA – Receive Data	
	SSEL1 / MAT2[0]	I/O O	SSEL1 – Slave Select for SSP1 MAT2[0] – Match output for Timer 2, channel 0	
40	P0[7] /	I/O	P0[7] – General purpose digital input/output pin.	I2C: SCK
	I2STX_CLK /	I/O	I2STX_CLK – Transmit Clock	
	SCK1 / MAT2[1]	I/O O	SCK1 – Serial Clock for SSP1 MAT2[1] – Match output for Timer 2, channel 1	

Pin No.	Pin Name	Type	Function on Module	Used on Eval as...
41	P0[0] / RD1 / TXD3 / SDA1	I/O I O I/O	P0[0] – General purpose digital input/output pin. RD1 – CAN1 receiver input TXD3 – Transmitter output for UART3 SDA1 – I ₂ C1 data input/output See LPC17xx manual Section 19.1 for details	I2C: SDA
42	P0[1] / TD1 / RXD3 / SCL1	I/O O I I/O	P0[1] – General purpose digital input/output pin. TD1 – CAN1 transmitter output RXD3 – Receiver input for UART3 SCL1 – I ₂ C1 clock input/output See LPC17xx manual Section 19.1 for details	I2C: SCL
43	V _{BAT}	P	V_{BAT} – RTC power supply If this pin is not powered, the RTC is still powered internally if VDD is present	Connected to battery holder over 1KΩ
44	RSVD		Reserved, do not connect	
45	P1[26] / MCOB1 / PWM1[6] / CAP0[0]	I/O O O I	P1[26] – General purpose digital input/output pin. MCOB1 – Motor Control PWM channel 1B PWM1[6] – Pulse Width Modulator 1, channel 6 CAP0[0] – Capture input for Timer 0, channel 0	M1: RST#
46	P1[28] / MCOA2 / PCAP1[0] / MAT0[0]	I/O O I O	P1[28] – General purpose digital input/output pin. MCOA2 – Motor Control PWM channel 2A PCAP1[0] – Capture input for PWM1, channel 0 CAP0[0] – Match output for Timer 0, channel 0	M2: RST#
47	nRSTOUT	O	nRSTOUT – This is a 3.3V pin. A LOW output on this pin indicates that the device is on the reset state, for any reason. This reflects the RESET input pin and all internal reset sources.	
48	nRESET	I	nRESET – External reset input: A LOW on this pin resets the device, causing I/O ports and peripherals to take on their default states, and processor execution to begin at address 0	Button: MRES
49	VDD	P	+3.3V supply voltage	
50	GND	P	Ground: 0V reference	

3.13 devolo Green PHY module V2 – J1 pinout

Pin No.	Pin Name	Type	Function on Module
1	GND	P	Ground: 0V reference
2	VDD	P	+3.3V supply voltage
3	RSVD		Reserved, do not connect
4	RSVD		Reserved, do not connect
5	RSVD		Reserved, do not connect
6	RSVD		Reserved, do not connect
7	RSVD		Reserved, do not connect
8	RSVD		Reserved, do not connect
9	RSVD		Reserved, do not connect
10	RSVD		Reserved, do not connect
11	RSVD		Reserved, do not connect
12	RSVD		Reserved, do not connect
13	GND	P	Ground: 0V reference
14	VDD	P	+3.3V supply voltage
15	GND	P	Ground: 0V reference
16	RSVD		Reserved, do not connect
17	RSVD		Reserved, do not connect
18	RSVD		Reserved, do not connect
19	RSVD		Reserved, do not connect
20	RSVD		Reserved, do not connect
21	RSVD		Reserved, do not connect
22	RSVD		Reserved, do not connect
23	GND	P	Ground: 0V reference
24	VDD	P	+3.3V supply voltage
25	RSVD		Reserved, do not connect
26	RSVD		Reserved, do not connect
27	RSVD		Reserved, do not connect
28	RSVD		Reserved, do not connect
29	RSVD		Reserved, do not connect
30	RSVD		Reserved, do not connect
31	RSVD		Reserved, do not connect
32	RSVD		Reserved, do not connect
33	RSVD		Reserved, do not connect
34	RSVD		Reserved, do not connect
35	RSVD		Reserved, do not connect
36	RSVD		Reserved, do not connect
37	GND	P	Ground: 0V reference
38	VDD	P	+3.3V supply voltage
39	RSVD		Reserved, do not connect
40	RSVD		Reserved, do not connect
41	GND	P	Ground: 0V reference
42	RSVD		Reserved, do not connect
43	RSVD		Reserved, do not connect
44	VDD	P	+3.3V supply voltage

Pin No.	Pin Name	Type	Function on Module
45	RSVD		Reserved, do not connect
46	RSVD		Reserved, do not connect
47	RSVD		Reserved, do not connect
48	RSVD		Reserved, do not connect
49	GND	P	Ground: 0V reference
50	VDD	P	+3.3V supply voltage

3.14 devolo Green PHY module V2 – J2 pinout

Pin No.	Pin Name	Type	Function on Module
1	GND	P	Ground: 0V reference
2	GND	P	Ground: 0V reference
3	G-PHY_RXP	I	RXP – PLC Positive differential input.
4	G-PHY_TXP	O	TXP – PLC Positive differential output.
5	G-PHY_RXN	I	RXN – PLC Negative differential input.
6	G-PHY_TXN	O	TXN – PLC Negative differential output.
7	GND	P	Ground: 0V reference
8	GND	P	Ground: 0V reference
9	G-PHY_PLC_ZC	I	ZC_IN – Zero Cross Input
10	G-PHY_ZC_GND	I	ZC_GND – Zero Cross Ground
11	G-PHY_GPIO[0]	I/O	GPIO 0 – Sets mode at power on, then becomes I/O
12	G-PHY_GPIO[1]	I/O	GPIO 1 – Sets mode at power on, then becomes I/O
13	G-PHY_GPIO[2]	I/O	GPIO 2 – Sets mode at power on, then becomes I/O
14	G-PHY_GPIO[3]	I/O	GPIO 3 – Sets mode at power on, then becomes I/O
15	RSVD		Reserved, do not connect
16	RSVD		Reserved, do not connect
17	RSVD		Reserved, do not connect
18	RSVD		Reserved, do not connect
19	VDD	P	+3.3V supply voltage
20	G-PHY_GPIO[4]	I/O	GPIO 4 – General purpose digital input/output pin SPP_intr – Interrupt output in SPI slave mode (active high)
21	VDD	P	+3.3V supply voltage
22	GND	P	Ground: 0V reference
23	ETH_TX+	O	Ethernet positive differential output
24	ETH_RX+	I	Ethernet positive differential input
25	ETH_TX-	O	Ethernet negative differential output
26	ETH_RX-	I	Ethernet negative differential input
27	ETH_VDDCTx	O	VDDCTX – Ethernet XFMR CTx (Common Tap) Power supply
28	ETH_VDDCTx	O	VDDCTX – Ethernet XFMR CTx (Common Tap) Power supply
29	VDD	P	+3.3V supply voltage
30	GND	P	Ground: 0V reference
31	ETH_LED1	O	Ethernet LED1 – Ethernet Link Activity LED indication (active High). A 1000 Ohms serial resistor is already placed. Please connect to GND in SPI slave mode.

Pin No.	Pin Name	Type	Function on Module
32	ETH_LED2	O	Ethernet LED2 – Ethernet Link Speed LED indication (active Low). 100 = on, 10 = off. A 1000 Ohms serial resistor is already placed. Please connect to GND in SPI slave mode
33	RSVD		Reserved, do not connect
34	RSVD		Reserved, do not connect
35	RSVD		Reserved, do not connect
36	RSVD		Reserved, do not connect
37	G-PHY_GPIO[7]	I/O O	GPIO 7 – General purpose digital input/output pin SSP_MISO – Master In Slave Out in SPI slave mode
38	G-PHY_GPIO[8]	I/O I	GPIO 8 – General purpose digital input/output pin SSP_MOSI – Master Out Slave In in SPI slave mode
39	G-PHY_GPIO[6]	I/O I	GPIO 6 – General purpose digital input/output pin SSP_SSEL –Slave Select (chip select) input in SPI slave mode
40	G-PHY_GPIO[5]	I/O I	GPIO 7 – General purpose digital input/output pin SSP_SCK – Serial Clock input in SPI slave mode
41	RSVD		Reserved, do not connect
42	RSVD		Reserved, do not connect
43	RSVD		Reserved, do not connect
44	RSVD	P	3.3V supply voltage
45	RSVD		Reserved, do not connect
46	RSVD		Reserved, do not connect
47	RSVD		Reserved, do not connect
48	nRESET	I	nRESET – External reset input: A LOW on this pin resets the device, causing I/O ports and peripherals to take on their default states, and processor execution to begin at address 0.
49	GND	P	Ground: 0V reference
50	VDD	P	+3.3V supply voltage

4 devolo Green PHY eval board V2 Specifications

Board Dimensions with GPM, no mikroBUS modules: 130mm x 100mm x 22mm

Symbol	Parameter	Min	Typ	Max
T _{OPERATE}	Operation Temperature	0°C		70°C
V _{SUPPLY}	Supply Voltage	4.75V	5V	5.25V
I _{SUPPLY}	Supply Current @5.1V with GPM*1		0.32A	0.52A

The dLAN® Green PHY module (GPM) or devolo Green PHY module V2 (GPMV2) is plugged into the Evaluation Board sockets **A** and **B**. For the dLAN® Green PHY module or devolo Green PHY module V2 specification, please see the relevant data sheets.

*1 If mikroBUS IO modules are plugged additionally into the Evaluation Board sockets **M1** and **M2**, their power consumption will increase the supply current. Please refer to the appropriate data sheets.

5 Revision History

Revision	Modifications
1.00	Original Issue
1.10	Add usage of devolo Green PHY module V2

© devolo solutions GmbH, Aachen (Germany)

While the information in this data sheet has been compiled with great care, it may not be deemed an assurance of product characteristics. devolo shall be liable only to the degree specified in the terms of sale and delivery.

devolo, dLAN® and the devolo logo are registered trademarks of devolo solutions GmbH.

Subject to change without notice. No liability for technical errors or omissions.