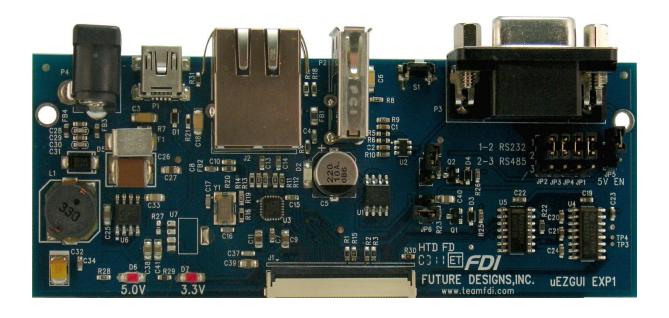
μEZGUI User's Manual

Covers the following products:

uEZGUI-EXP1







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Introduction

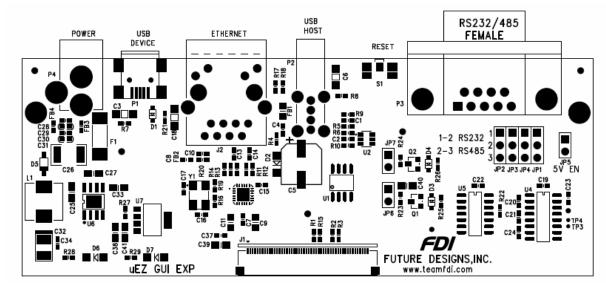
The uEZGUI-EXP1 is a quick and easy solution for adding additional hardware to the uEZGUI family of products. The uEZGUI-EXP1 offers the hardware necessary for USB Host and Device, Ethernet, RS232, and RS485.

Functional Description

- RS232/RS485 Serial communication
- USB Host and Device
- 10/100 Ethernet

Expansion Board Capabilities

The uEZGUI Expansion Board enhances the capabilities of the standard uEZGUI board to include additional IO capabilities. The Expansion Board is connected to the uEZGUI main board via a 50pin FPC cable.



Orderable part numbers

The uEZGUI-EXP1 is available by itself, or as part of the uEZGUI-43-H01 production module.

Please see FDI's website for the latest purchasing and distributor information.

Expansion Connector

FDI's uEZGUIs include a 50 pin FPC Expansion Connector that provides a wide variety of capabilities for user expansion, ranging from 10/100 Ethernet to USB Host, etc. The part number used for the FPC connector is **OMRON XF2M-5015-1A**. The table below provides the pin out and signal used on the uEZGUI-EXP1: (see the corresponding uEZGUI schematics for the up-to-date listings of all pin capabilities)

1 - 2 393 volts (3V3) 3.3 Volts DC Output DEXP1 from BZSQUI Power Powe	Pin#	Pin Name	Pin Description	Input/output
USBD_VBUS	1-2	3p3 volts (3V3)	3.3 Volts DC Input to EXP1 from uEZGUI	Power
USB Device port on uEZGUI-EXP1 Input / Output	3 – 5	5volts (5V0)	5.0 Volts DC Output to uEZGUI	Power
8 USBD_DP	6	I IISBD VBUS		
9 P0.2_TXD0	7	USBD_DM	USB_D-2 – USB port 2 bidirectional D –line (USB Device port on uEZGUI-EXP1)	Input / Output
P0.3_RXDO	8	USBD_DP	USB_D+2 – USB port 2 bidirectional D+ line (USB Device port on uEZGUI-EXP1)	Input / Output
ISP_ENTRY	9	P0.2_TXD0	TXD0 – Transmitter output for UARTO. (for RS232)	Output
Mylle REST is LOW forces on-chip boot loader to take over control of the part after a reset.	10	P0.3_RXD0	RXD0 – Receiver input for UARTO. (for RS232)	Input
P1.0_ENET_TXD0	11	ISP_ENTRY		Input / Output
14 P.1.ENET_TXD1 ENET_TXD1 = ENET_TX_EN = Ethernet transmit data enable (RMII/MII interface) Output 15 P.1.4_ENET_TXEN ENET_TX_EN = Ethernet transmit data enable (RMII/MII interface) Output 16 P.1.8_ENET_CRSDV ENET_CRSDV ENET_CRS = Ethernet Carrier Sense/Data Valid (RMII interface) Input 17 P.1.9_ENET_RXDO ENET_RXDO ENET_RXDO = Ethernet receive data 0 (RMII/MII interface) Input 18 P.1.0_ENET_RXDO = ENET_RXDO = Ethernet receive data 1 (RMII/MII interface) Input 19 3p3 voits (3V3) 3.3 Voits DC Input to EXP1 from uEZGUI P.1.4_ENET_RX_ER ENET_RX_ER = Ethernet receive data 1 (RMII/MII interface) Input 20 P.1.4_ENET_RX_ER ENET_RX_ER = Ethernet receive data 1 (RMII/MII interface) Input 21 P.1.5_ENET_REF_CLK ENET_RX_ER = Ethernet receive data 0 (RMII/MII interface) Input 22 OND Ground P.1.6_ENET_REF_CLK/ENET_RX_CLK - Ethernet Reference Clock (RMII interface) Input 22 OND Ground P.1.6_ENET_MDO ENET_MDO = Ethernet MIII dock Output 23 P.1.6_ENET_MDO ENET_MDO = Ethernet MIII dock Output 24 P.1.7_ENET_MDIO ENET_MDIO = Ethernet MIII data input and Output Input / Output 25 OUTput 26 OND GROUND ENET_MDIO = Ethernet MIII data input and Output Input / Output 27 RESET_OUT RETOUT - This is a 3.3 V pin. LOW on this pin indicates LPC1788 being in Reset state Output 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. TTL with hysteresis OND Ground Unused 31 Unused Unused Unused 32 Unused Unuse	12	GND	Ground	Power
15 P.1.4_ENET_TXEN	13	P1.0_ENET_TXD0	ENET_TXD0 – Ethernet transmit data 0 (RMII/MII interface)	Output
ENET_CRS_DV/ENET_CRS - Ethernet Carrier Sense/Data Valid (RMII interface)	14	P1.1_ENET_TXD1	ENET_TXD1 – Ethernet transmit data 1 (RMII/MII interface)	Output
Sense Mill interface	15	P1.4_ENET_TXEN	ENET_TX_EN – Ethernet transmit data enable (RMII/MII interface)	Output
18	16	P1.8_ENET_CRSDV		Input
19 3p3 volts (3v3) 3.3 Volts DC Input to EXP1 from uEZGUI P1.14_ENET_RX_ER ENET_RX_ER ENET_RX_ER ENET_RX_ER ENET_RX_ER ENET_RX_CLK Enternet receive error (RMII/MII interface) Input 21 P1.15_ENET_REFICLK ENET_RX_CLK Enternet Reference Clock (RMII interface) Enternet Receive Clock (MII interface) 22 GND Ground Power 23 P1.16_ENET_MDC ENET_MDC ENET_M	17	P1.9_ENET_RXD0	ENET_RXD0 – Ethernet receive data 0 (RMII/MII interface)	Input
P1.14_ENET_RX_ER	18	P1.10_ENET_RXD1	ENET_RXD1 – Ethernet receive data 1 (RMII/MII interface)	Input
P1.15_ENET_REFCLK Clock (Mill interface) POWER P1.15_ENET_REFCLK GROD Ground POWER P1.16_ENET_MDC ENET_MDC - Ethernet MilM clock P1.17_ENET_MDIO ENET_MDIO - Ethernet MilM data input and Output Input / Output Unused RESET_OUT RSTOUT - This is a 3.3 V pin. LOW on this pin indicates LPC1788 being in Reset state Unused RESET_IN 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. TTL with hysteresis Power Unused Usball - PPWR USB PPWR1 - Port Power enable signal for USB port 1. (USB Host port on uEZGUI-EXP1) USB1H_DVC USB_OVC - Overcurrent detection (USB Host port on uEZGUI-EXP1) Input USB1H_PWRD USB_DVB DVS DVT - USB port 1 bidirectional D- line. (USB Host port on uEZGUI-EXP1) Input / Output USB_DND USB_DND USB_DND USB_D- USB_DOT 1 bidirectional D- line. (USB Host port on uEZGUI-EXP1) Input / Output Power Power Power Power Power Power Power USB PO.15_TXD1 TXD1 - Transmitter output for UART1. (for RS485) Input Unused Unused P0.15_TXD1 TXD1 - Receiver input for UART1. (for RS485) Unused Unused Unused Unused Unused P0.22_RTS1 RTS1 - Request to Send output for UART1. (for RS485) Unused Unused Unused Unused	19	3p3 volts (3V3)	·	Power
22 GND Ground FILEY_MDIO - Ethernet MIIM clock Output 24 P1.17_ENET_MDIO ENET_MDIO - Ethernet MIIM data input and Output Input / Output 25 Unused 26 Unused 27 RESET_OUT RSTOUT - This is a 3.3 V pin. LOW on this pin indicates LPC1788 being in Reset state Output take on their default states, and processor execution to begin at address 0. TTL with hysteresis 29 GND Ground Unused 30 Unused 31 Unused 32 Unused 33 Unused 34 Unused 35 Unused 36 USB1H_PWRD USB_PPWR1 - Port Power enable signal for USB port 1. (USB Host port on uEZGUI-EXP1) Input 37 USB1H_OVC USB_OVC - Overcurrent detection (USB Host port on uEZGUI-EXP1) Input 39 USB1_DP USB_D+1 - USB_port 1 bidirectional D+ line. (USB Host port on uEZGUI-EXP1) Input / Output 40 USB1_DM USB_D+1 - USB_port 1 bidirectional D+ line. (USB Host port on uEZGUI-EXP1) Input / Output 41 GND Ground FXDI (FOR SABS) Input 42 P0.15_TXD1 TXD1 - Transmitter output for UART1. (for RS485) Output 44 P0.15_TXD1 RTS1 - Request to Send output for UART1. (for RS485) Output 46 Unused 47 Unused 48 Unused 49 Unused	20	P1.14_ENET_RX_ER	ENET_RX_ER – Ethernet receive error (RMII/MII interface)	Input
P1.16_ENET_MDC	21	P1.15_ENET_REFCLK		Input
P1.17_ENET_MDIO ENET_MDIO - Ethernet MIIM data input and Output Unused RESET_OUT RSTOUT - This is a 3.3 V pin. LOW on this pin indicates LPC1788 being in Reset state Output take on their default states, and processor execution to begin at address 0. TTL with hysteresis GND Ground Unused UsB1H_PPWR USB_PPWR1 - Port Power enable signal for USB port 1. (USB Host port on uEZGUI-EXP1) Input USB1H_PWRD USB_PWRD - 5V power detection (USB Host port on uEZGUI-EXP1) Input USB1_DP USB_D+1 - USB port 1 bidirectional D- line. (USB Host port on uEZGUI-EXP1) Input / Output USB1_DM Ground USB_DD USB_D-1 - USB port 1 bidirectional D- line. (USB Host port on uEZGUI-EXP1) Input / Output Output / Output FORD FOWER USB_POWER - SV power detection (USB Host port on uEZGUI-EXP1) Input / Output USB1_DM USB_D-1 - USB port 1 bidirectional D- line. (USB Host port on uEZGUI-EXP1) Input / Output FORD FOWER USB_DD USB_D-1 - USB port 1 bidirectional D- line. (USB Host port on uEZGUI-EXP1) Input / Output FORD FOWER PO.15_TXD1 TXD1 - Transmitter output for UART1. (for RS485) Output FOWER PO.22_RTS1 RTS1 - Request to Send output for UART3. (for RS485) Input Unused Unused Unused	22	GND	Ground	Power
Unused U	23	P1.16_ENET_MDC		Output
RESET_OUT RSTOUT - This is a 3.3 V pin. LOW on this pin indicates LPC1788 being in Reset state Output RESET_IN External reset input: A LOW on this pin indicates LPC1788 being in Reset state Output take on their default states, and processor execution to begin at address 0. TTL with hysteresis Power OND Ground Unused Unused Unused Unused Unused Unused Unused Unused UsB_PPWR USB_PPWR1 - Port Power enable signal for USB port 1. (USB Host port on uEZGUI-EXP1) Output USB1H_PWRD USB_DVC - Overcurrent detection (USB Host port on uEZGUI-EXP1) Input USB1H_PWRD USB_DYN = DVS power detection (USB Host port on uEZGUI-EXP1) Input USB1_DP USB_DY1 - USB port 1 bidirectional D+ line. (USB Host port on uEZGUI-EXP1) Input OUSB1_DM Ground Power Power Power Pouse Unused Pouse Unused Pouse Unused Pouse Unused	24	P1.17_ENET_MDIO	ENET_MDIO – Ethernet MIIM data input and Output	Input / Output
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30	28	RESET_IN		Input
31 Unused 32 Unused 33 Unused 34 Unused 35 Unused 36 USB1H_PPWR USB_PPWR1 – Port Power enable signal for USB port 1. (USB Host port on uEZGUI-EXP1) Output 37 USB1H_OVC USB_OVC – Overcurrent detection (USB Host port on uEZGUI-EXP1) Input 38 USB1H_PWRD USB_PWRD – 5V power detection (USB Host port on uEZGUI-EXP1) Input 39 USB1_DP USB_D+1 – USB port 1 bidirectional D+ line. (USB Host port on uEZGUI-EXP1) Input / Output 40 USB1_DM USB_D+1 – USB port 1 bidirectional D-line. (USB Host port on uEZGUI-EXP1) Input / Output 41 GND Ground Power 42 P0.15_TXD1 TXD1 — Transmitter output for UART1. (for RS485) Output 43 P0.16_RXD1 RXD1 — Receiver input for UART1. (for RS485) Input 44 P0.17_CTS1 CTS1 CTS1 CLear to Send input for UART1. (for RS485) Output 45 P0.22_RTS1 RTS1 — Request to Send output for UART1. (for RS485) 46 Unused 47 Unused 48 Unused	29	GND	Ground	Power
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47 Unused 48 Unused 49 Unused		P0.22_RTS1		Output
48 Unused 49 Unused				
49 Unused				
50 GND Ground Power				,
	50	GND	Ground	Power

Expansion Connector Cable Details

The maximum length for the expansion connector cables is as follows: General Purpose IO, TTL, Serial, etc = 6" recommended maximum, 8" absolute maximum Ethernet, high-speed IO, etc = 3" recommended maximum, 4" absolute maximum

The following table provides example part numbers for the expansion cables:

Description	Mfg	Mfg PN	Digi-Key Pn
3" 50-pin 0.5mm	Molex	21020-7650	WM10231-ND
6" 50-pin 0.5mm	Molex	21020-0548	WM10223-ND

Note: These lengths are only recommendations. The actual lengths utilized will be dependent on the expansion board circuitry, layouts and general environment of the application. It is up to the customer to test and validate the functional operation and use of the expansion connectors.

DC Power Input - P4

The uEZGUI-EXP1 supports a 7VDC-24VDC 1A (min) Power Supply. The connector is 2.1mm with center positive.

44	Pin Number	Description
1 2	1	7VDC to 24VDC, +/- 10%, 1.0A (min)
	2	Power Supply Ground

USB Device - P1

The UEZGUI-EXP1 Board includes one USB Device Interface allowing the unit to be connected to a USB Host, such as a PC. Through this connection, the uEZGUI represents a peripheral to the USB Host. The operational mode of the port is dependent on the software utilized (i.e. Mass Storage or Human-Interface).

Note: The USB Device connector of the Expansion Board is connected in parallel to the USB Device connector of the uEZGUI Main board. To avoid damage or improper operation, do not connect both of these at the same time.

The UEZGUI-EXP1 Board may also be powered via the USB Device connector. Care must be taken to not overload the USB Host since 500mA is the maximum current allowable via USB.

	Pin Number	Description
	1	USB 5V
3 81-16	2	D-
2-1111	3	D+
	4	NC
1 2 3 4 5	5	Signal Ground

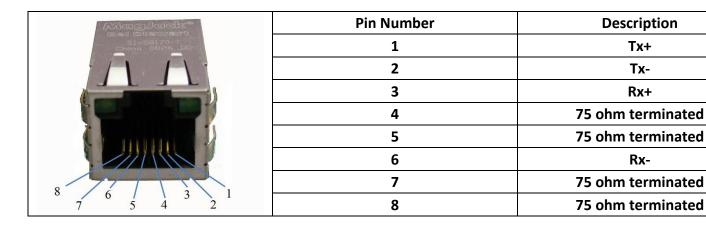
USB Host - P2

The uEZGUI-EXP1 Board includes one USB Host Port allowing the unit to interface to various USB peripherals such as a USB Flash Drive (Thumb Drive). The operational mode of this port is dependent on the software utilized (i.e. driver support)

	Pin Number	Description
4 -3 -2 -1	1	USB VBus
	2	D-
	3	D+
	4	Signal Ground

Ethernet - J2

The UEZGUI-EXP1 Board includes one 10/100 Ethernet Port to interface to a local area network via CAT5 cable. Please refer to the specific details of the LPC1788 processor being utilized for support of the Ethernet Port function.



Supported uEZGUIs

The uEZGUI-EXP1 is currently supported on the following uEZGUIs:

- uEZGUI-1788-43WQR
- uEZGUI-4088-43WQN
- uEZGUI-1788-70WVT
- uEZGUI-1788-70WVM
- uEZGUI-1788-56VI
- uEZGUI-RX62N-35QT

Serial Port - P3

The uEZGUI-EXP1 Board includes one female DB9 Serial Port Connector. This connector may operate in either RS232 or RS485 (Full-duplex) interface levels depending on jumper settings of JP1 through JP4.

Jumpers JP1 – JP4 select the operating mode of the serial port;

Jumper 1-2 for RS232 levels, using UARTO

Jumper 2-3 for RS485 levels, using UART1

When operating as RS232, the serial port may also be optionally configured to support ISP programming of the LPC1788 using FlashMagic Software. To enable ISP programming, jumper JP6 & JP7 must be loaded. Note that with these jumpers loaded, operation of the LPC1788 may be affected by the RS232 interface signals. Refer to the FlashMagic user manual for details.

Pin Number	RS485 Mode	RS232 Mode
1	No Connect	No Connect
2	485_RDB-	TXD (Output)
3	485_TDA+	RXD (Input)
4	Signal Ground	No Connect
5	Signal Ground	Signal Ground
6	Signal Ground	Signal Ground
7	485_RDA+	(OPT) RTS
8	485_TDB-	(OPT) CTS
9	(OPT 5V)	No Connect

Example Connections to the uEZGUI Boards



uEZGUI-1788-43WQR example connection with uEZGUI-EXP1



uEZGUI-1788-70WVT example connection with uEZGUI-EXP1



uEZGUI-43-H01 production module: uEZGUI-1788-43WQR with uEZGUI-EXP1 mounted in OEM Housing