



GM903

Gaming I/O Control Board
User's Manual

Copyright

This publication contains information that is protected by copyright. No part of it may be reproduced in any form or by any means or used to make any transformation/adaptation without the prior written permission from the copyright holders.

This publication is provided for informational purposes only. The manufacturer makes no representations or warranties with respect to the contents or use of this manual and specifically disclaims any express or implied warranties of merchantability or fitness for any particular purpose. The user will assume the entire risk of the use or the results of the use of this document. Further, the manufacturer reserves the right to revise this publication and make changes to its contents at any time, without obligation to notify any person or entity of such revisions or changes.

Changes after the publication's first release will be based on the product's revision. The website will always provide the most updated information.

© 2025. All Rights Reserved.

Trademarks

Product names or trademarks appearing in this manual are for identification purpose only and are the properties of the respective owners.

FCC and DOC Statement on Class B

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio TV technician for help.

Notice:

1. The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
2. Shielded interface cables must be used in order to comply with the emission limits.

Table of Contents

Chapter 1 - Introduction.....	6
Specifications	6
Chapter 2 - Hardware Installation.....	7
Board Layout.....	7
Top View.....	7
Bottom View.....	7
Jumper Settings	8
FPGA Write Protection (GFJ1)	8
MCU Write Protection (GMJ1).....	8
Pin Assignment	9
Door8 (DRJ8) For External.....	9
Door7 (DRJ7) For System.....	9
Coin BAT (BTJ1).....	10
UART RFU (TSJ1).....	10
SPK (AMCN1)	11
Door8 & I2C (DRCN2).....	11
USB/Audio/UART (GSJ2)	12
FPGA Write (GFJ2).....	12
ST-Link / F.W. updater (GMJ2).....	13
Ext. IO (IBJ1).....	13
Meter Power1~8 (MPCN1).....	14
COM1/CC-Talk1 & COM2/CC-Talk2 (TSCN1).....	14
DO1 ~ DO16 (DOCN1).....	15
DO17~DO32 (DOCN2).....	15
Door1~6 (DRCN1)	16
DI1 ~ DI16 (DICN1)	16
PClex1 with Power (GSJ1).....	17
DI17~DI32 (DICN2).....	17

About this Manual

This manual can be downloaded from the website.

The manual is subject to change and update without notice, and may be based on editions that do not resemble your actual products. Please visit our website or contact our sales representatives for the latest editions.

Warranty

1. Warranty does not cover damages or failures that occur from misuse of the product, inability to use the product, unauthorized replacement or alteration of components and product specifications.
2. The warranty is void if the product has been subjected to physical abuse, improper installation, modification, accidents or unauthorized repair of the product.
3. Unless otherwise instructed in this user's manual, the user may not, under any circumstances, attempt to perform service, adjustments or repairs on the product, whether in or out of warranty. It must be returned to the purchase point, factory or authorized service agency for all such work.
4. We will not be liable for any indirect, special, incidental or consequential damages to the product that has been modified or altered.

Static Electricity Precautions

It is quite easy to inadvertently damage your PC, system board, components or devices even before installing them in your system unit. Static electrical discharge can damage computer components without causing any signs of physical damage. You must take extra care in handling them to ensure against electrostatic build-up.

1. To prevent electrostatic build-up, leave the system board in its anti-static bag until you are ready to install it.
2. Wear an antistatic wrist strap.
3. Do all preparation work on a static-free surface.
4. Hold the device only by its edges. Be careful not to touch any of the components, contacts or connections.
5. Avoid touching the pins or contacts on all modules and connectors. Hold modules or connectors by their ends.



Important:

Electrostatic discharge (ESD) can damage your processor, disk drive and other components. Perform the upgrade instruction procedures described at an ESD workstation only. If such a station is not available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the system chassis. If a wrist strap is unavailable, establish and maintain contact with the system chassis throughout any procedures requiring ESD protection.

Safety Measures

- To avoid damage to the system, use the correct AC input voltage range.
- To reduce the risk of electric shock, unplug the power cord before removing the system chassis cover for installation or servicing. After installation or servicing, cover the system chassis before plugging the power cord.

About the Package

The package contains the following items. If any of these items are missing or damaged, please contact your dealer or sales representative for assistance.

- 1 GM903 board

The board and accessories in the package may not come similar to the information listed above. This may differ in accordance with the sales region or models in which it was sold. For more information about the standard package in your region, please contact your dealer or sales representative.

Before Using the System Board

When installing the system board in a new system, you will need at least the following internal components.

- Memory module
- Storage device such as a hard disk drive.
- Power supply

External system peripherals may also be required for navigation and display, including at least a keyboard, a mouse and a video display monitor.

Chapter 1 - Introduction

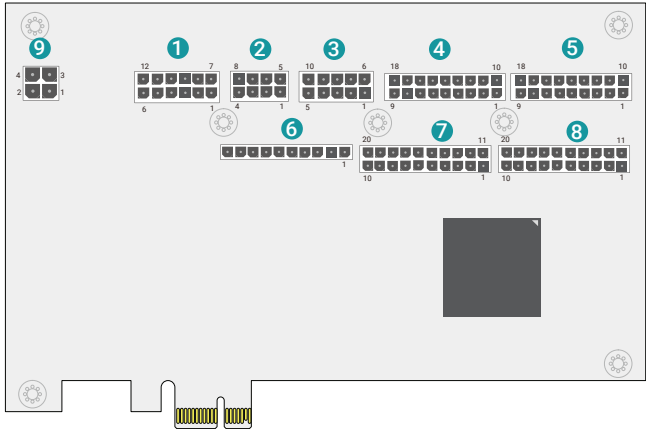
► Specifications

PROCESSOR	FPGA + MCU	FPGA & MUC implementation of the gaming features controller
INTERNAL I/O	Host Interface	High/Low speed connector 1 x PCIe x1 slot (Gold finger)
	UART	Pin header for UART signal input
	USB	Pin header for USB 2.0 signal input
	I2C	Pin header for I2C signal input
GAMING I/O	Intrusion Detection	8 x intrusion detection Logs Date/ Time of latest 64 events Operates with and without system active (G3 power from BAT) 5 Years data retention during AC off
	DI/DO	32-bit Digital Input 32-bit OC output (29-bit x 500mA, 3-bit x 3A, up to 24V), Low Active
	Meter Power	8 ports can be set as meter output with disconnect detect
	Serial	2 x RS232/CCTalk (TX/RX)
	Audio	Stereo 6W+6W Class D Audio AMP Output
	Security (by request)	SHA-256 or AES-256 128B RBG
	SRAM (NVRAM)	Support 2pcs SRAM (BGA type) 2 x SRAM supported with battery backup, Default 4MB/Single (up to 16MB/Dual) Backup to Retain Data for 5 years during AC off
	EEPROM	EEPROM 2KB
	Coin battery	1 x CR2032 Lithium 3V/220mAh with socket type 1 header for cable type
	iButton	Support iButton 1-wire protocol Support ds1996 device (default)
POWER	Power input	12V DC in
HARDWARE	Dimension	170mm x 113 mm

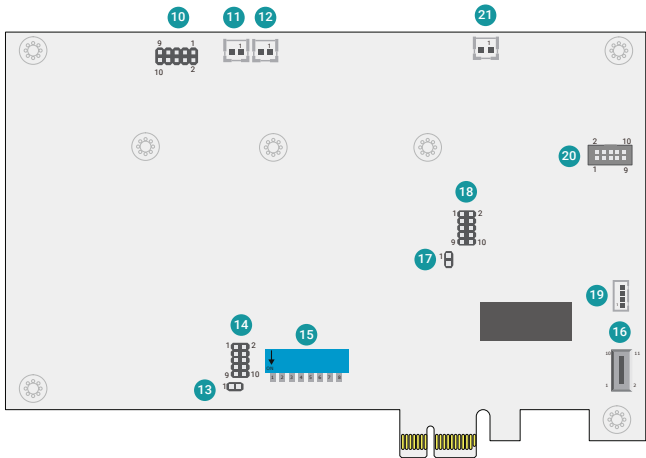
Chapter 2 - Hardware Installation

► Board Layout

Top View



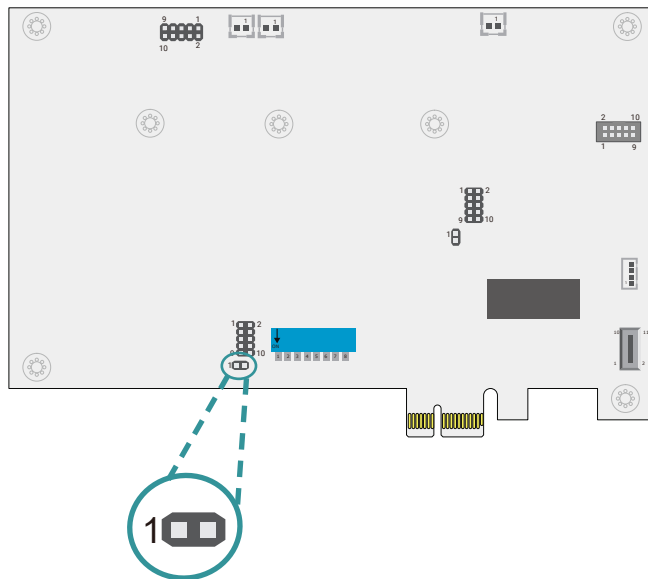
Bottom View



- | | | | |
|----|--------------------------------|----|------------------------|
| 1 | Door1~6 | 11 | Door8 |
| 2 | Door8 & I2C | 12 | Door7 |
| 3 | COM1/CC-Talk1
COM2/CC-Talk2 | 13 | FPGA Write Protection |
| 4 | D01 ~ D016 | 14 | FPGA Write |
| 5 | D017~D032 | 15 | 8bit DIP Switch |
| 6 | Meter Power1~8 | 16 | PClex1 with Power |
| 7 | DI1 ~ DI16 | 17 | MCU Write Protection |
| 8 | DI17~DI32 | 18 | ST-Link / F.W. updater |
| 9 | SPK | 19 | UART RFU |
| 10 | Ext. IO | 20 | USB/Audio/UART |
| | | 21 | Coin BAT |

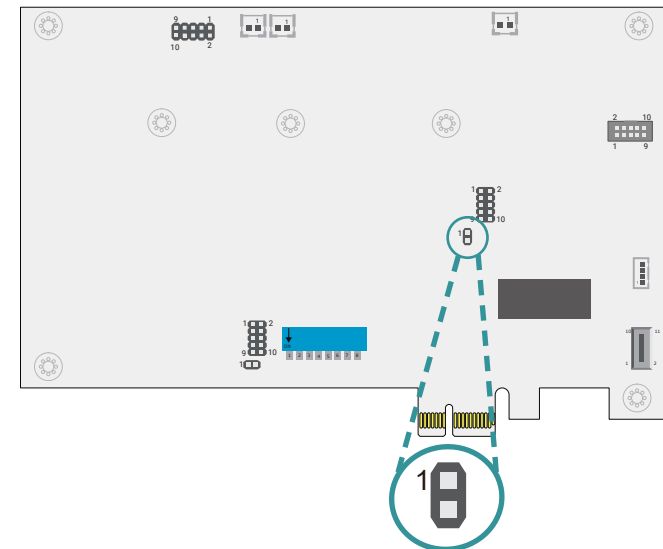
► Jumper Settings

FPGA Write Protection (GFJ1)



- 1-2 On: F.W. Update Programmable
- None: Protective Mode

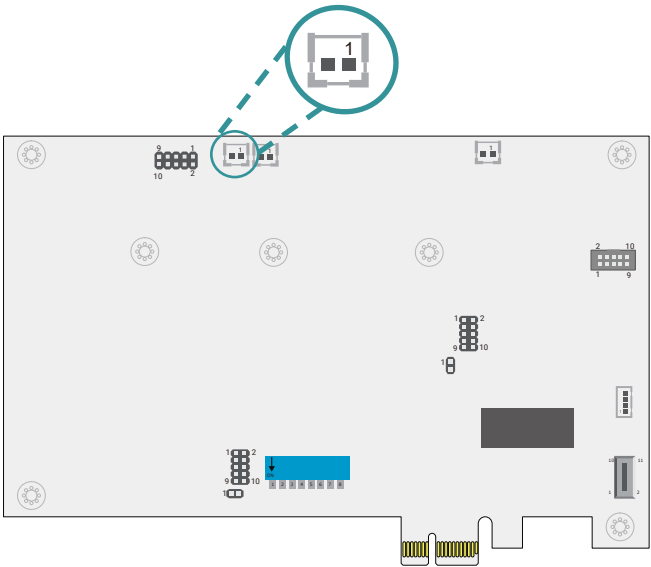
MCU Write Protection (GMJ1)



- 1-2 On: F.W. Update Programmable
- None: Protective Mode

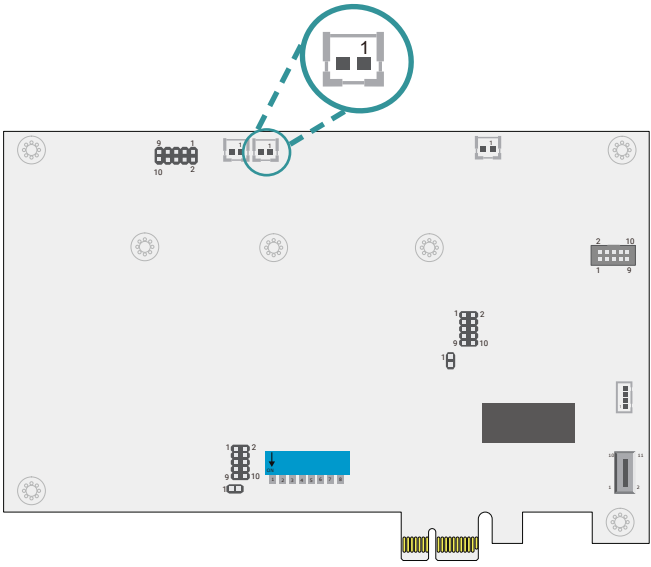
► Pin Assignment

Door8 (DRJ8) For External



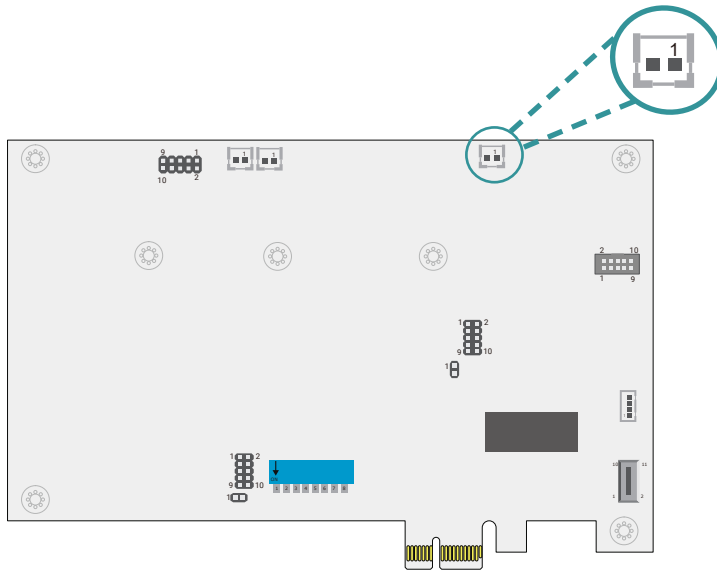
Pin	Assignment
1	DOORH#2
2	DOORH#1

Door7 (DRJ7) For System



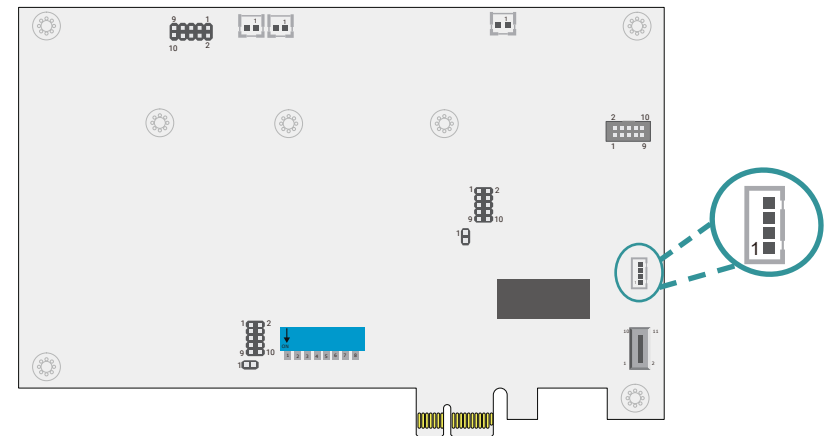
Pin	Assignment
1	DOORG#2
2	DOORG#1

Coin BAT (BTJ1)



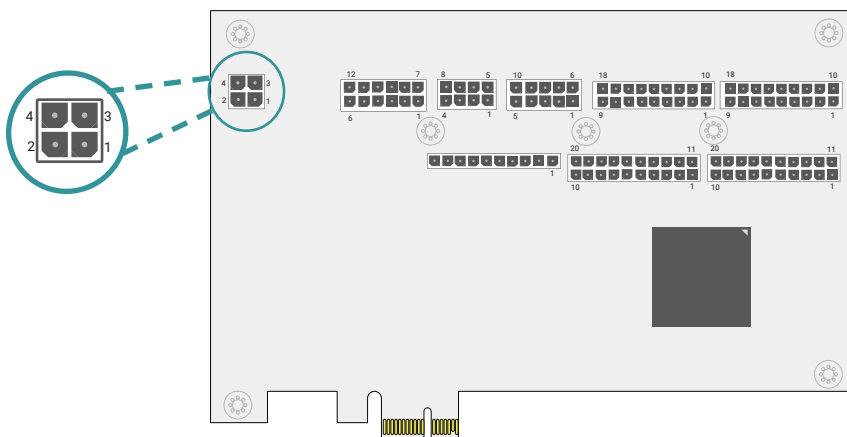
Pin	Assignment
1	GND
2	+VBAT

UART RFU (TSJ1)



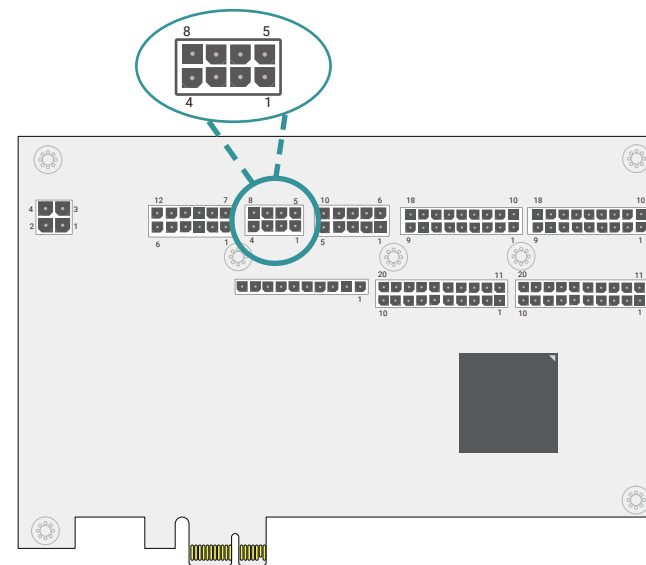
Pin	Assignment
1	+5V (input)
2	HOST_TX (input)
3	HOST_RX (output)
4	GND

SPK (AMCN1)



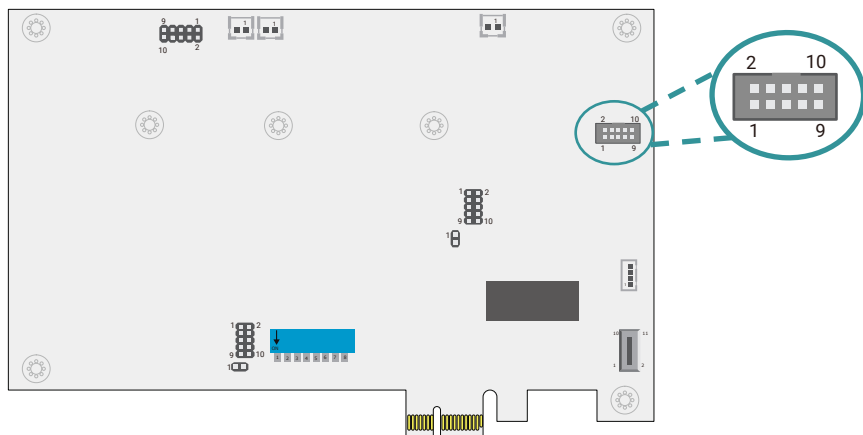
Pin	Assignment
1	R_SPK+
2	L_SPK+
3	R_SPK-
4	L_SPK-

Door8 & I2C (DRCN2)



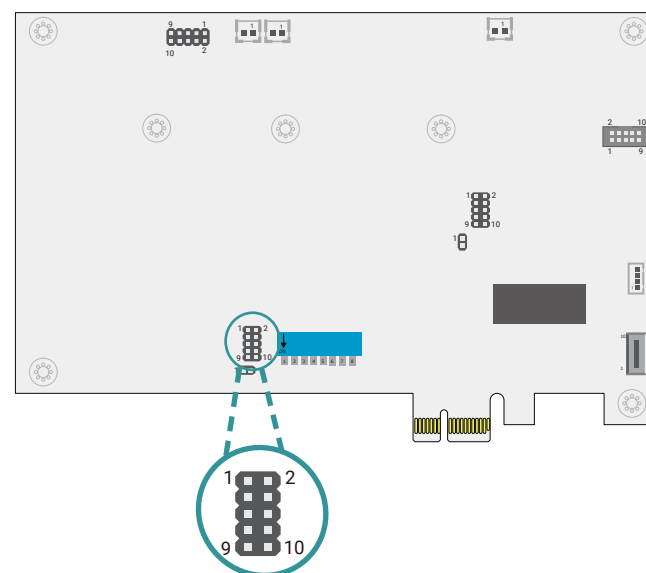
Pin	Assignment
1	DOORH#2
2	I2C_ALT# (3.3V)
3	I2C_DAT (3.3V)
4	I2C_CLK (3.3V)
5	DOORH#1
6	+3.3V (~0.5A)
7	GND
8	GND

USB/Audio/UART (GSJ2)



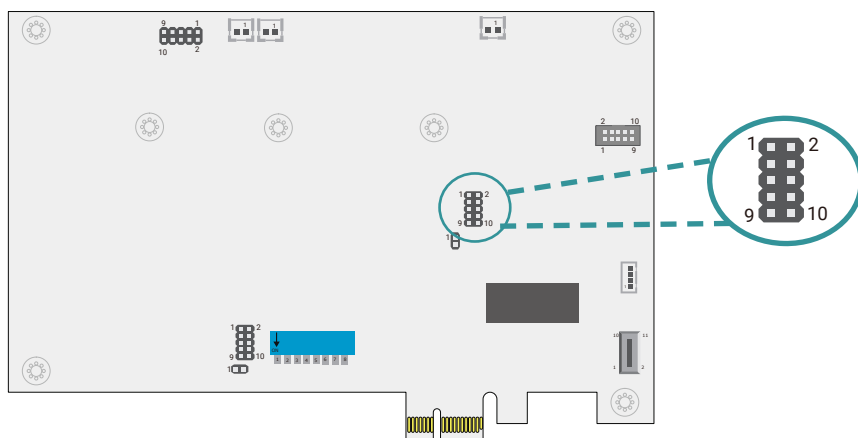
Pin	Assignment	Pin	Assignment
1	GND	2	GND
3	USBD-	4	AUDIO-R
5	USBD+	6	AUDIO-L
7	GND	8	GND
9	UART-RX (Host) (output)	10	UART-TX (Host) (input)

FPGA Write (GFJ2)



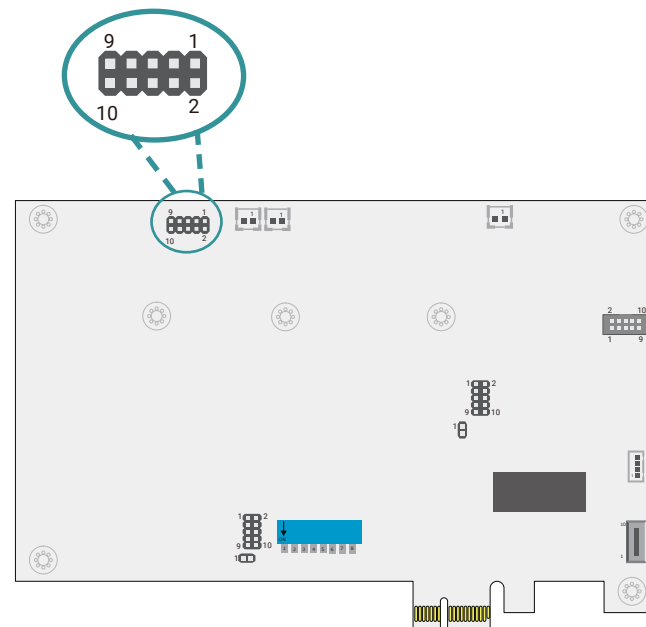
Pin	Assignment	Pin	Assignment
1	JTAG-JTCK	2	GND
3	JTAG-JTDO	4	NC
5	JTAG-JTMS	6	JTAG-3.3V
7	+3.3V	8	JTAG-RST#
9	JTAG-JTDI	10	GND

ST-Link / F.W. updater (GMJ2)



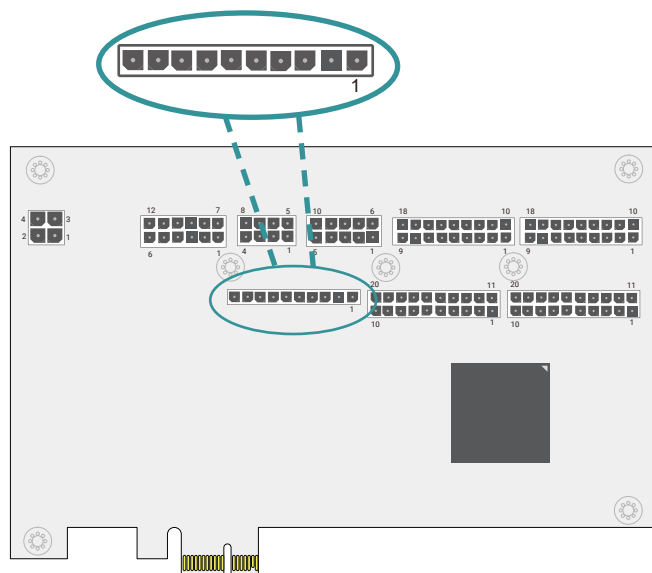
Pin	Assignment	Pin	Assignment
1	+3.3V (input)	2	UART1_TX
3	GND	4	UART1_RX
5	SWDIO	6	GND
7	SWCLK	8	UART2_TX
9	RST#	10	UART2_RX

Ext. IO (IBJ1)



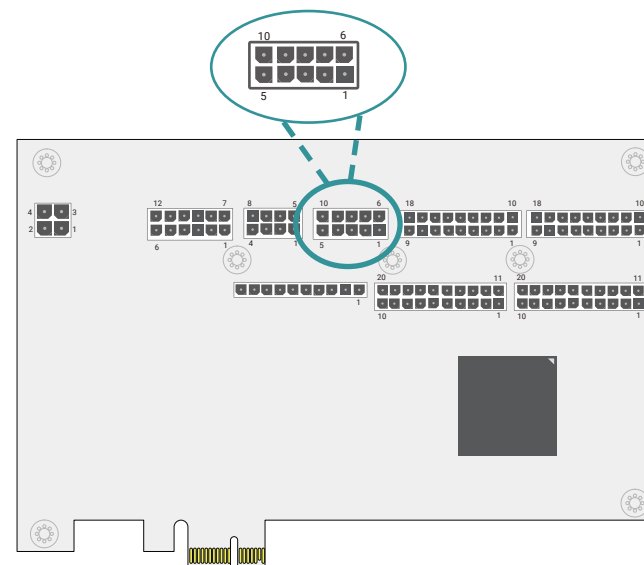
Pin	Assignment	Pin	Assignment
1	+12V (~0.1A)	2	IB_DI
3	+5V (~0.1A)	4	IB_DO
5	+3.3V (~0.1A) / GPIO4	6	GPIO1
7	iButton_Onewire#	8	GPIO2
9	GND	10	GPIO3

Meter Power1~8 (MPCN1)



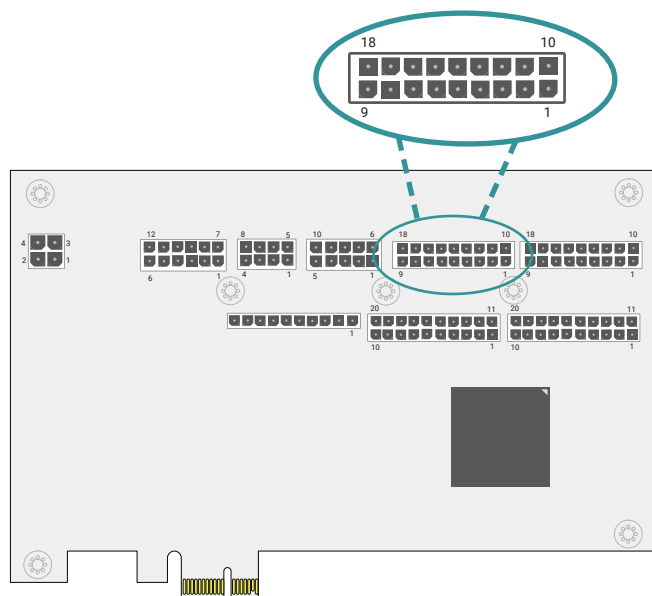
Pin	Assignment	Pin	Assignment
1	+12V MeterPWR1	2	+12V_MeterPWR2
3	+12V_MeterPWR3	4	+12V_MeterPWR4
5	+12V_MeterPWR5	6	+12V_MeterPWR6
7	+12V_MeterPWR7	8	+12V_MeterPWR8
9	NC	10	NC

COM1/CC-Talk1 & COM2/CC-Talk2 (TSCN1)



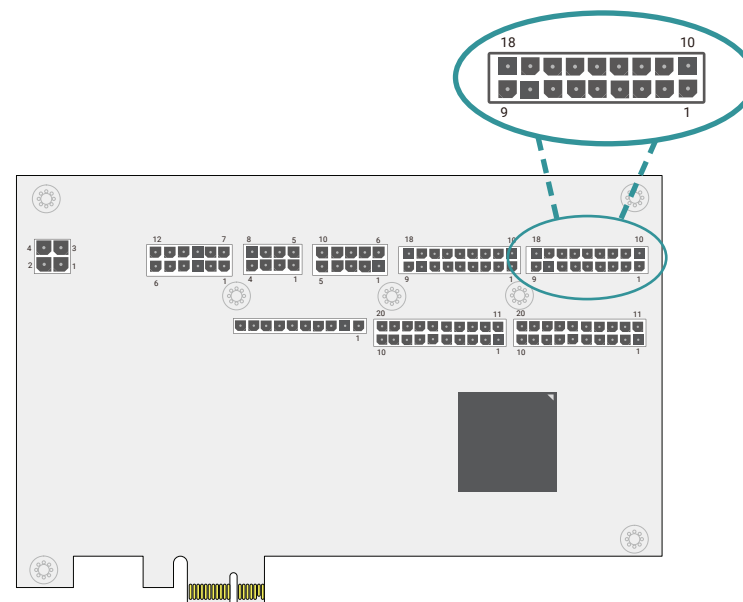
Pin	Assignment	Pin	Assignment
1	+12V (0.5A)	2	CCTALK_CH2
3	GND	4	COM2_TX
5	COM2_RX	6	+12V (0.5A)
7	CCTALK_CH1	8	GND
9	COM1_TX	10	COM1_RX

DO1 ~ DO16 (DOCN1)



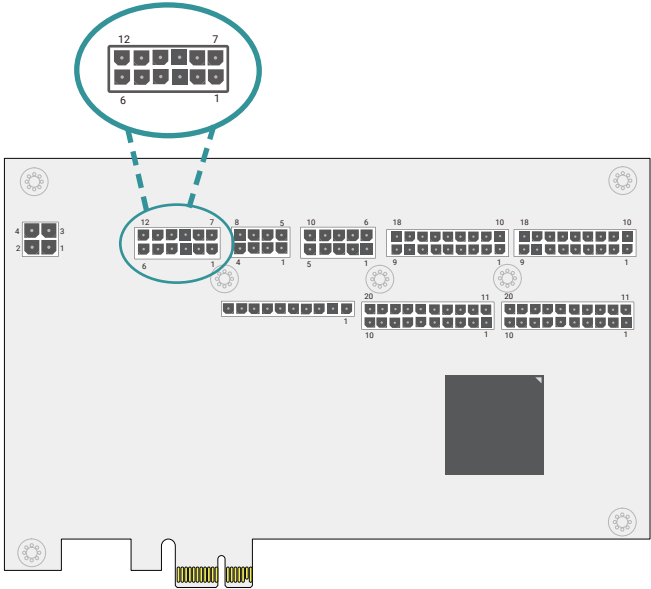
Pin	Assignment	Pin	Assignment
1	DO_1	2	DO_2
3	DO_3	4	DO_4
5	DO_5	6	DO_6
7	DO_7	8	DO_8
9	DO_9	10	DO_10
11	DO_11	12	DO_12
13	DO_13	14	DO_14
15	DO_15	16	DO_16
17	GND	18	GND

DO17~DO32 (DOCN2)



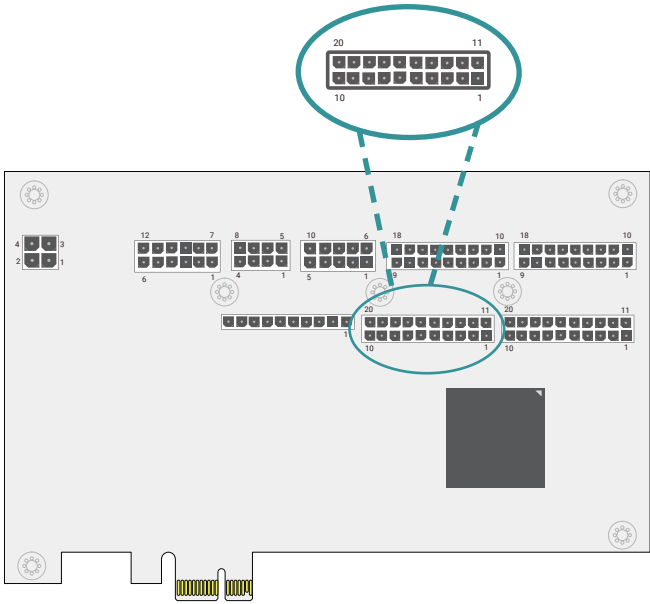
Pin	Assignment	Pin	Assignment
1	DO_17 / Meter1	2	DO_18 / Meter2
3	DO_19 / Meter3	4	DO_20 / Meter4
5	DO_21 / Meter5	6	DO_22 / Meter6
7	DO_23 / Meter7	8	DO_24 / Meter8
9	DO_25	10	DO_26
11	DO_27	12	DO_28
13	DO_29	14	DO_30
15	DO_31	16	DO_32
17	GND	18	GND

Door1~6 (DRCN1)



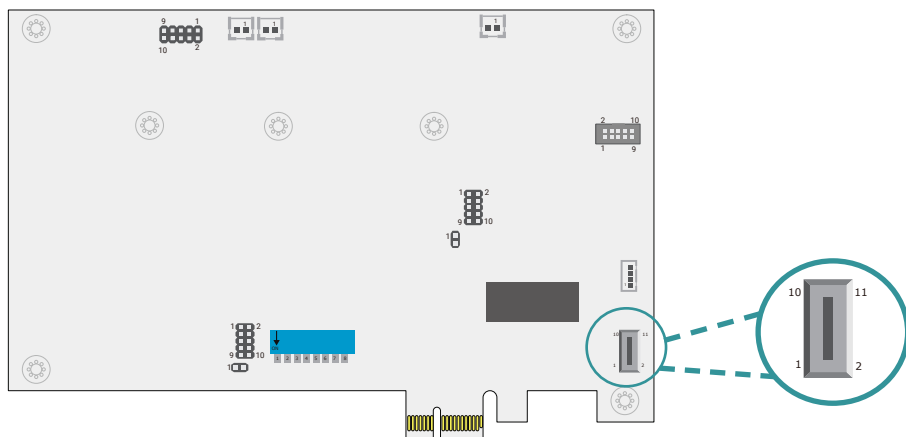
Pin	Assignment	Pin	Assignment
1	DOORA#2	2	DOORB#2
3	DOORC#2	4	DOORD#2
5	DOORE#2	6	DOORF#2
7	DOORA#1	8	DOORB#1
9	DOORC#1	10	DOORD#1
11	DOORE#1	12	DOORF#1

DI1 ~ DI16 (DICN1)



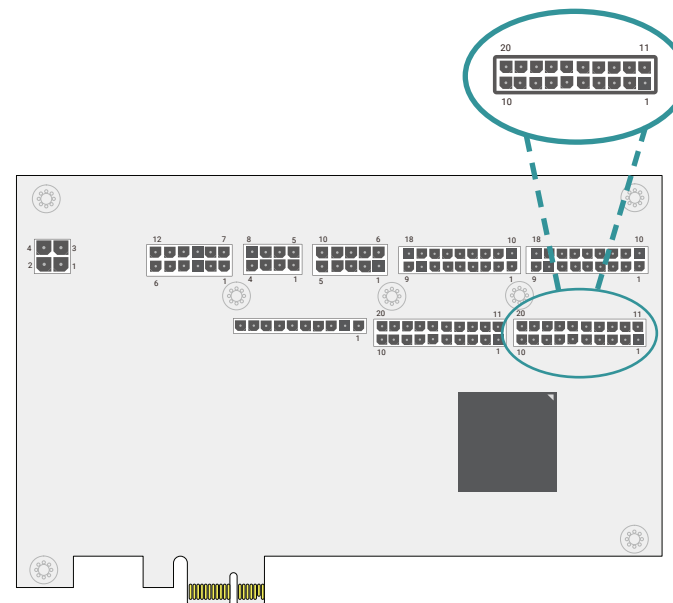
Pin	Assignment	Pin	Assignment
1	DI_1	2	DI_2
3	DI_3	4	DI_4
5	DI_5	6	DI_6
7	DI_7	8	DI_8
9	DI_9	10	DI_10
11	DI_11	12	DI_12
13	DI_13	14	DI_14
15	DI_15	16	DI_16
17	GND	18	GND
19	GND	20	GND

PClex1 with Power (GSJ1)



Pin	Assignment	Pin	Assignment
1	GND	2	PCIE_CLK+
3	PCIE_CLK-	4	GND
5	PCIE_RX+	6	PCIE_RX-
7	GND	8	PCIE_TX+
9	PCIE_TX-	10	+12V
11	GND	12	+3.3V
13	+3.3V	14	GND
15	SMB_CLK (reserved)	16	SMB_DATA (reserved)
17	GND	18	+3V3SB
19	PCIE_RST#	20	+12V

DI17~DI32 (DICN2)



Pin	Assignment	Pin	Assignment
1	DI_17	2	DI_18
3	DI_19	4	DI_20
5	DI_21	6	DI_22
7	DI_23	8	DI_24
9	DI_25	10	DI_26
11	DI_27	12	DI_28
13	DI_29	14	DI_30
15	DI_31	16	DI_32
17	GND	18	GND
19	GND	20	GND