



Connect Tech Inc.
Embedded Computing Experts

USERS GUIDE



EDGE-AQ

CTIM-00138(0.00) 2025-10-30

 **Toradex** | Proven Partner

CONNECT TECH

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PREFACE

Disclaimer

The information contained within this user's guide, including but not limited to any product specification, is subject to change without notice.

Connect Tech assumes no liability for any damages incurred directly or indirectly from any technical or typographical errors or omissions contained herein or for discrepancies between the product and the user's guide.

Customer Support Overview

If you experience difficulties after reading the manual and/or using the product, contact the Connect Tech reseller from which you purchased the product. In most cases the reseller can help you with product installation and difficulties.

In the event that the reseller is unable to resolve your problem, our highly qualified support staff can assist you. Our support section is available 24 hours a day, 7 days a week on our website at: <http://connecttech.com/support/resource-center/>. See the contact information section below for more information on how to contact us directly. Our technical support is always free.

Contact Information

Contact Information	
Mail/Courier	Connect Tech Inc. Technical Support 489 Clair Rd. W. Guelph, Ontario Canada N1L 0H7
Contact Information	sales@connecttech.com support@connecttech.com www.connecttech.com Toll Free: 800-426-8979 (North America only) Telephone: +1-519-836-1291 Facsimile: 519-836-4878 (on-line 24 hours)
Support	Please go to the Connect Tech Resource Center for product manuals, installation guides, device drivers, BSPs and technical tips. Submit your technical support questions to our support engineers. Technical Support representatives are available Monday through Friday, from 8:30 a.m. to 5:00 p.m. Eastern Standard Time.

Limited Product Warranty

Connect Tech Inc. provides a one-year Warranty for this product. Should this product, in Connect Tech Inc.'s opinion, fail to be in good working order during the warranty period, Connect Tech Inc. will, at its option, repair or replace this product at no charge, provided that the product has not been subjected to abuse, misuse, accident, disaster or non-Connect Tech Inc. authorized modification or repair.

You may obtain warranty service by delivering this product to an authorized Connect Tech Inc. business partner or to Connect Tech Inc. along with proof of purchase. Product returned to Connect Tech Inc. must be pre-authorized by Connect Tech Inc. with an RMA (Return Material Authorization) number marked on the outside of the package and sent prepaid, insured and packaged for safe shipment. Connect Tech Inc. will return this product by prepaid ground shipment service.

The Connect Tech Inc. Limited Warranty is only valid over the serviceable life of the product. This is defined as the period during which all components are available. Should the product prove to be irreparable, Connect Tech Inc. reserves the right to substitute an equivalent product if available or to retract the Warranty if no replacement is available.

The above warranty is the only warranty authorized by Connect Tech Inc. Under no circumstances will Connect Tech Inc. be liable in any way for any damages, including any lost profits, lost savings or other incidental or consequential damages arising out of the use of, or inability to use, such product.

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ESD Warning



Electronic components and circuits are sensitive to ElectroStatic Discharge (ESD). When handling any circuit board assemblies including Connect Tech COM Express carrier assemblies, it is recommended that ESD safety precautions be observed. ESD safe best practices include, but are not limited to:

- Leaving circuit boards in their antistatic packaging until they are ready to be installed.
- Using a grounded wrist strap when handling circuit boards, at a minimum you should touch a grounded metal object to dissipate any static charge that may be present on you.
- Only handling circuit boards in ESD safe areas, which may include ESD floor and table mats, wrist strap stations and ESD safe lab coats.
- Avoiding handling circuit boards in carpeted areas.
- Try to handle the board by the edges, avoiding contact with components.

REVISION HISTORY

Revision	Date	Changes
0.00	2025-10-30	Preliminary Release

INTRODUCTION

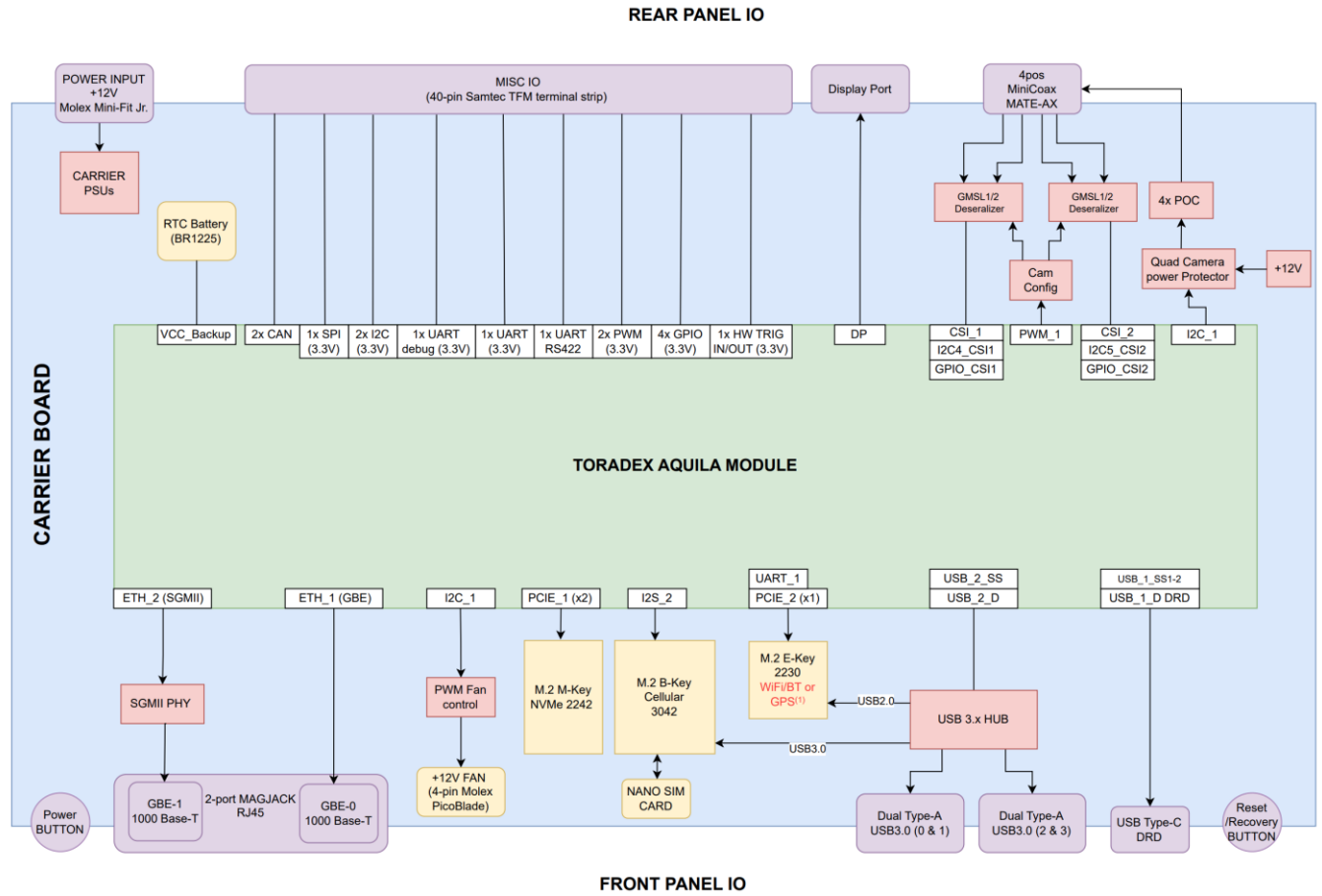
Connect Tech’s EDGE-AQ brings a deployable Toradex Aquila AM69 to the market. The EDGE-AQ’s design includes a Locking Power Input (+12V), Dual Gigabit Ethernet, DisplayPort video, 4 x USB 3.2 Gen 1 Type A, 4 x GMSL 1/2 Cameras, USB 3.2 Gen 2 (w/ DRD functionality), M.2 (B-Key 3042, M-Key 2242, and E-Key 2230 functionality; bottom access panel), 40 Pin Locking IO connector, RTC battery.

Product Feature and Specifications

Feature	EDGE-AQ
Module Compatibility	Toradex Aquila AM69
Mechanical Dimensions	136mm x 75mm x 109mm
USB	4x USB 3.2 Gen 1 (Type-A) - 5Gbps 1x USB 3.2 Gen 1 DRD (Type-C) – 5Gbps 1x USB 3.0 + 2.0 Port to M.2 B-Key 1x USB 2.0 to M.2 E-Key
GMSL Cameras	4x GMSL 1/2 Camera Inputs (Connector: Quad Micro COAX) Deserializers Embedded on Carrier Board
Networking	2x 1G BASE-T
Storage	1x NVMe (M.2 2242 M-KEY)
Wireless Expansion	1x WiFi Module or GPS (M.2 2230 E-KEY) 1x LTE Module (M.2 3042 B-KEY) w/ Nano SIM Card Connector
Misc. I/O	2x UART (1x Console) 1x RS-422 2x I2C 1x SPI 2x PWM 4x GPIO 2x non-isolated CAN 2.0b 1x External Trigger for Cameras 2x 5V 2x 3.3V 9x GND
RTC Battery	BR1225 Battery Holder
Pushbutton	Power (Green status LED) Reset/Force Recovery (Blue status LED)
Power Input	+12V DC Power Input (Mini-Fit Jr. 4-Pin Locking)
Operating Temperature	TBD
Weight	Actively cooled system (ESG202-02): 944g, 2.08 lbs. Passively cooled system: TBD
Warranty and Support	1 Year Warranty and Free Support

PRODUCT OVERVIEW

Block Diagram



Notes:

(1) Standard build uses Aquila SoM Wifi/BT. Optional E-Key expansion with GPS or alternate Wifi/BT

Connector Locations

FRONT VIEW



REAR VIEW



External Connector Summary


Location	Connector	Mating Part or Connector
Back	PWR IN	+12V Mini-Fit Jr. 4-Pin DC Power Input Connector
Back	EXPANSION I/O	40 Pin MISC. IO Connector
Back	DisplayPort	DisplayPort Connector
Back	GMSL	GMSL 1/2 Quad Camera Connector
Front	GbE1, GbE2	Dual RJ-45 Gigabit Ethernet Connector
Front	USB 1, 2, 3, 4	USB 3.2 Gen 1 (Type-A) - 5Gbps Connector
Front	EXPANSION I/O	40-Pin MISC. IO Connector
Front	USB Type-C	USB 3.2 Gen 1 DRD (Type-C) - 10Gbps
Front	PWR	Power ON/OFF Pushbutton
Front	RST/REC	Reset / Force Recovery Pushbutton
Front	ANT 1, 2	Antenna (WiFi/BT is defaulted to these locations)
Back	ANT 3, 4	Antenna (LTE or cell Modem is defaulted to these locations)

DETAILED FEATURE DESCRIPTION

Toradex Aquila Module Connector

The Texas Instruments AM69A processor and chipset are implemented on the Toradex Aquila AM69 Module. This connects to the EDGE-AQ carrier board via a Samtec APM6-100-06.5-S-04-0 connector.

Function	Description
Location	Internal to EDGE-AQ
Type	Module
Pinout	Refer to Toradex Aquila AM69 Datasheet.
Features	Refer to Toradex Aquila AM69 Datasheet.

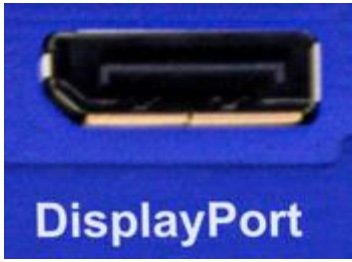


Note: A Thermal Transfer Plate is mounted to the Toradex Aquila AM69 module internally to the EDGE-AQ. Heat will dissipate through to the top of the EDGE-AQ chassis.

DisplayPort Connector

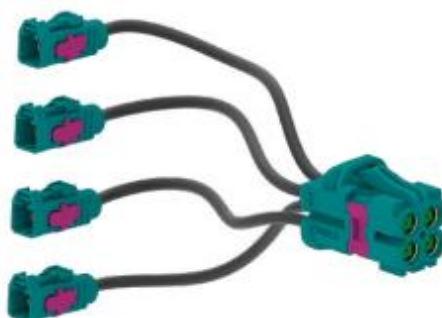
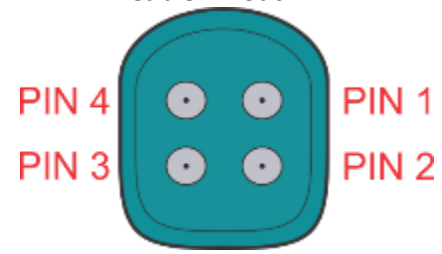

The Toradex Aquila AM69 module will output video via the EDGE-AQ DisplayPort connector.

Function	Description
Location	Back
Type	DisplayPort Right Angle Connector
Mating Connector	DisplayPort Cable
Pinout	Refer to DisplayPort Standard




GMSL 1/2 Connector

The EDGE-AQ allows GMSL 1 or GMSL 2 through the Quad MATE-AX connector. The GMSL to MIPI Deserializers are embedded on the carrier board, which uses 4-Lane MIPI video per 2 cameras. Additionally, the EDGE-AQ outputs +12V Power Over COAX (POC) with a 2A current capability (500mA per camera).

Function		Description		Connector Images
Location		Back		
Type		GMSL 1/2 Camera Connector		
Mating Cable		Quad Fakra GMSL Cable 4 Position MATE-AX to 4 x FAKRA Z-code 50Ω RG174 Cable CTI P/N: CBG341 (1 meter)		 <p>Cable Pinout</p> 
Pin	GMSL Channel	MIPI-Lanes	Description	Camera Connector
1	CH1	CSI_2	Camera Connector	
2	CH2	CSI_2	Camera Connector	
3	CH3	CSI_1	Camera Connector	
4	CH4	CSI_1	Camera Connector	

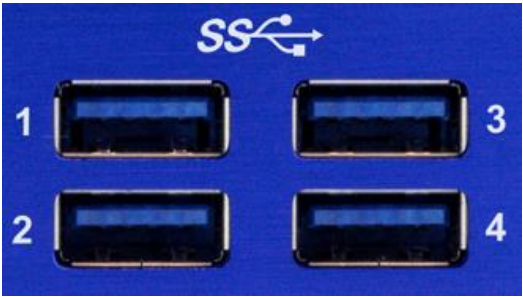
USB 3.2 Type-C DRD

The EDGE-AQ implements a USB 3.2 Gen 1 (Type-C) connector with DRD (Dual-Role Device). It allows for host mode access to the module or flashing of the module during Force Recovery. This port is 5Gbps capable and has a 2A current limit.

Function	Description	
Location	Front	
Type	Type-C USB Connector	
Mating Connector	USB 3.2 Type-C cable	
Pinout	Refer to USB Standard	

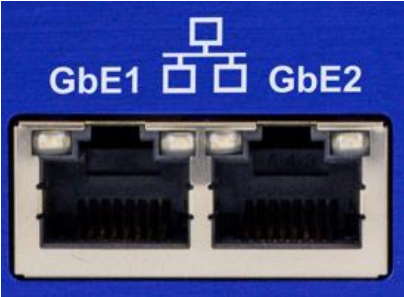
USB 3.2 Type-A Connector

The EDGE-AQ incorporates a total of 4x USB 3.2 Gen 1 Type-A ports. These are available through 2x Dual stacked USB3.2 Type-A connectors from an on-board USB hub. All USB Type-A ports are 5 Gbps capable and have a 1A current limit per port.

Function	Description	
Location	Front	
Type	USB Type-A Connector	
Mating Connector	USB Type-A Cable	
Pinout	Refer to USB Standard	

1G Dual Ethernet Connector

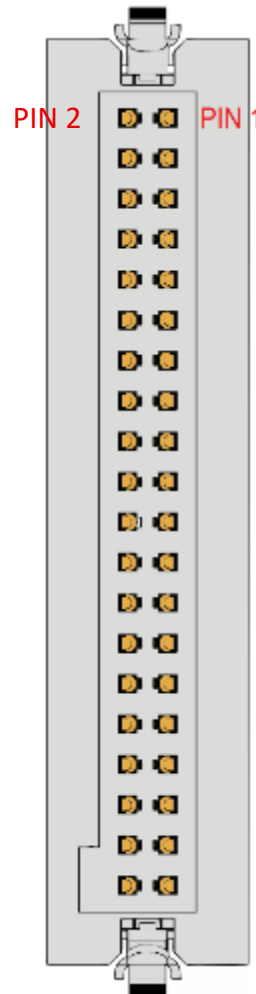
The EDGE-AQ implements 2x RJ45 1G BASE-T ethernet connectors for internet communication. GbE1 is connected directly to the Toradex Aquila AM69 module. GbE2 is connected through an SGMII Gigabit Ethernet PHY.

Function	Description	
Location	Front	
Type	Dual RJ45 Connector	
Mating Connector	RJ45 Ethernet Cable CAT 5e or better	
Pinout	Refer to Ethernet Standard	

IO Expansion Connector

The EDGE-AQ implements several general purpose I/O features on this interface including: GPIO, PWM, UART, SPI and I2C. All I/O are at +3.3V logic level unless specified.

Function		Description	
Location		Back	
Type		IO Expansion Connector	
Carrier Connector		TFM-120-02-L-DH-TR	
Mating Cable		CBG629 / SFSD-20-28C-G-12.00-SR Manufacturer: Samtec	
Pinout	Colour	Description	I/O Type
1	Brown	+5V ⁽¹⁾	Power
2	Red	SPI1_MOSI	O
3	Orange	SPI1_MISO	I
4	Yellow	SPI1_SCK	O
5	Green	SPI1_CS0	O
6	Violet	+3.3V ⁽¹⁾	Power
7	Gray	GND	Power
8	White	CAN1_H ⁽⁴⁾	I/O
9	Black	CAN2_H ⁽⁴⁾	I/O
10	Blue	CAN1_L ⁽⁴⁾	I/O
11	Brown	CAN2_L ⁽⁴⁾	I/O
12	Red	GND	Power
13	Orange	UART3_TX_DEBUG	O
14	Yellow	UART3_RX_DEBUG	I
15	Green	GND	Power
16	Violet	I2C2_SCL	O
17	Gray	I2C2_SDA	I/O
18	White	GND	Power
19	Black	I2C6_SCL	O
20	Blue	I2C6_SDA	I/O
21	Brown	GND	Power
22	Red	GPIO1 ⁽²⁾ (3)	I
23	Orange	GPIO2 ⁽²⁾ (3)	I



24	Yellow	GPIO3 ^{(2) (3)}	O
25	Green	GPIO4 ^{(2) (3)}	O
26	Violet	GND	Power
27	Gray	PWM_2 ^{(2) (3)}	O
28	White	PWM_3 ^{(2) (3)}	O
29	Black	GND	Power
30	Blue	RXD+ (RS422)	I
31	Brown	RXD- (RS422)	I
32	Red	TXD+ (RS422)	O
33	Orange	TXD- (RS422)	O
34	Yellow	GND	Power
35	Green	+5V ⁽¹⁾	Power
36	Violet	UART4_TX	O
37	Gray	UART4_RX	I
38	White	+3.3V ⁽¹⁾	Power
39	Black	EXT_TRIG ⁽²⁾	I/O
40	Blue	GND	Power

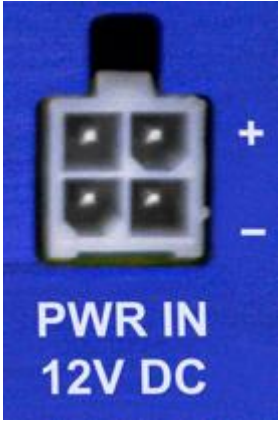
Notes:

1. The power pins for +3.3V and +5V are outputs only; **DO NOT** feed power to these pins. Each power rail has a combined limit fused at 2A total for both pins.
2. Alternative Interface Configurations available, see DIP switch configurations
3. GPIO drive information:
 - a. GP_Out_x - are driven outputs and can sink or source 12mA
 - b. GP_In_x - $V_{IH} = 2V$, $V_{IH} = 0.8V$
No pullup or pulldown is pre-configured, user discretion to add externally if required for their application (or contact Sales for carrier customization)
 - c. PWM_Out_x - are driven outputs and can sink or source 12mA
4. The CAN interface features split termination, optionally enabled with DIP switch S1.

Power Connector

The EDGE-AQ implements a Mini-Fit Jr. 4-Pin Power Connector that accepts +12V DC power.

Function	Description	
Location	Back	
Type	Mini-Fit Jr. 4-Pin Connector	
Nominal Input Voltage	+12V DC Only	
CTI Mating Cable	CTI PN: CBG408	
Pinout	Conn. Pins	Description
	1	GND
	2	GND
	3	+VIN
	4	+VIN

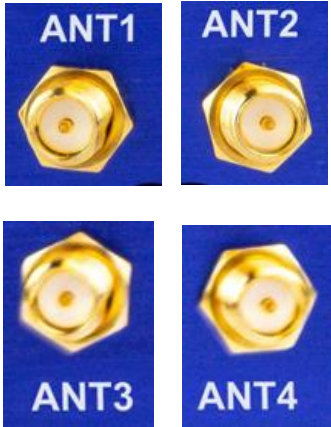


Note: A Power Supply capable of 200W or more is required to operate the EDGE-AQ with all peripherals running at their respective maximum rating.

Antenna Connectors

The EDGE-AQ chassis implements 4x SMA Antenna Connectors (Optional) for the Aquila SoM WiFi/BT (or M.2 2230 E-Key WiFi/Bluetooth) and M.2 3042 B-Key (Cellular).

Function	Description	
Location	Front and Rear	
Type	RP-SMA Female Connector	
Mating Connector	RP-SMA Male Antenna Connector	
ANT#	Module	Description
1	WiFi	AUX
2	WiFi	MAIN
3	LTE	MAIN
4	LTE	Diversity



TYPICAL INSTALLATION

1. Ensure all external system power supplies are off and disconnected.
2. Install the necessary cables for your application. At a minimum these would include:
 - a) Power cable to the input power connector.
 - b) Ethernet cable into its port (if applicable).
 - c) DisplayPort video cable (if applicable).
 - d) Keyboard, Mouse, etc. via USB (if applicable).
 - e) GMSL Camera(s) (if applicable).
 - f) MISC. IO 40-Pin Connector (if applicable).
 - g) Antennas for WiFi/Bluetooth (if applicable).
 - h) Antennas for Cellular (if applicable).
- 3) Connect the Power Cable of the +12V Power Supply into the Mini-Fit Jr. 4-Pin power connector.
- 4) Plug the AC cable into the Power Supply and into the wall socket. **DO NOT** power up your system by plugging in live power.

CABLES INCLUDED

Part Number	Description	Qty
CBG408	Power Input Cable	1
CBG629 / SFSD-20-28C-G-12.00-SR	MISC IO Breakout Cable (Flying Leads)	1

ACCESSORIES

Part Number	Description
MSG098	AC/DC Power Supply 200W w/ 4-pin Molex Mini-Fit Jr. Plug
CBG341	Quad FAKRA GMSL1/2 Cable
MSG067	Mounting Brackets
MSG093	WiFi/BT Antenna

APPROVED VENDORS CAMERAS

Contact Connect Tech Support at support@connecttech.com for more information.

MECHANICAL DETAILS

See product page on the Connect Tech Website for the latest 3D models or send an email request to: support@connecttech.com