TOUCAN TC-0710 SLIM HMI PRODUCT MANUAL

(TC-0710)

VER. 1.00

July 27, 2018

REVISION HISTORY

Revision	Date	Originator	Notes
1.00	July 27, 2018	TechNexion	First public release

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1. Introduction

1.1. General Care and Maintenance

Your device is a product of superior design and craftsmanship and should be treated with care.

The following suggestions will help you.

- Keep the device dry. Precipitation, humidity, and all types of liquids or moisture can contain minerals that will corrode electronic circuits. If your device does get wet, allow it to dry completely.
- Do not use or store the device in dusty or dirty areas. Its parts and electronic components can be damaged.
- Do not store the device in hot areas. High temperatures can shorten the life of electronic devices, damage batteries, and warp or melt certain plastics.
- Do not store the device in cold areas. When the device returns to its normal temperature, moisture can form inside the device and damage electronic circuit boards.
- Do not open the device while power is on. Otherwise electrical shock may result.
- Do not drop, knock, or shake the device. Rough handling can break internal circuit boards and fine mechanics.
- Do not use harsh chemicals, cleaning solvents, or strong detergents to clean the device.
- Do not paint the device. Paint can clog the moving parts and prevent proper operation.
- Unauthorized modifications or attachments could damage the device and may violate regulations governing radio devices.

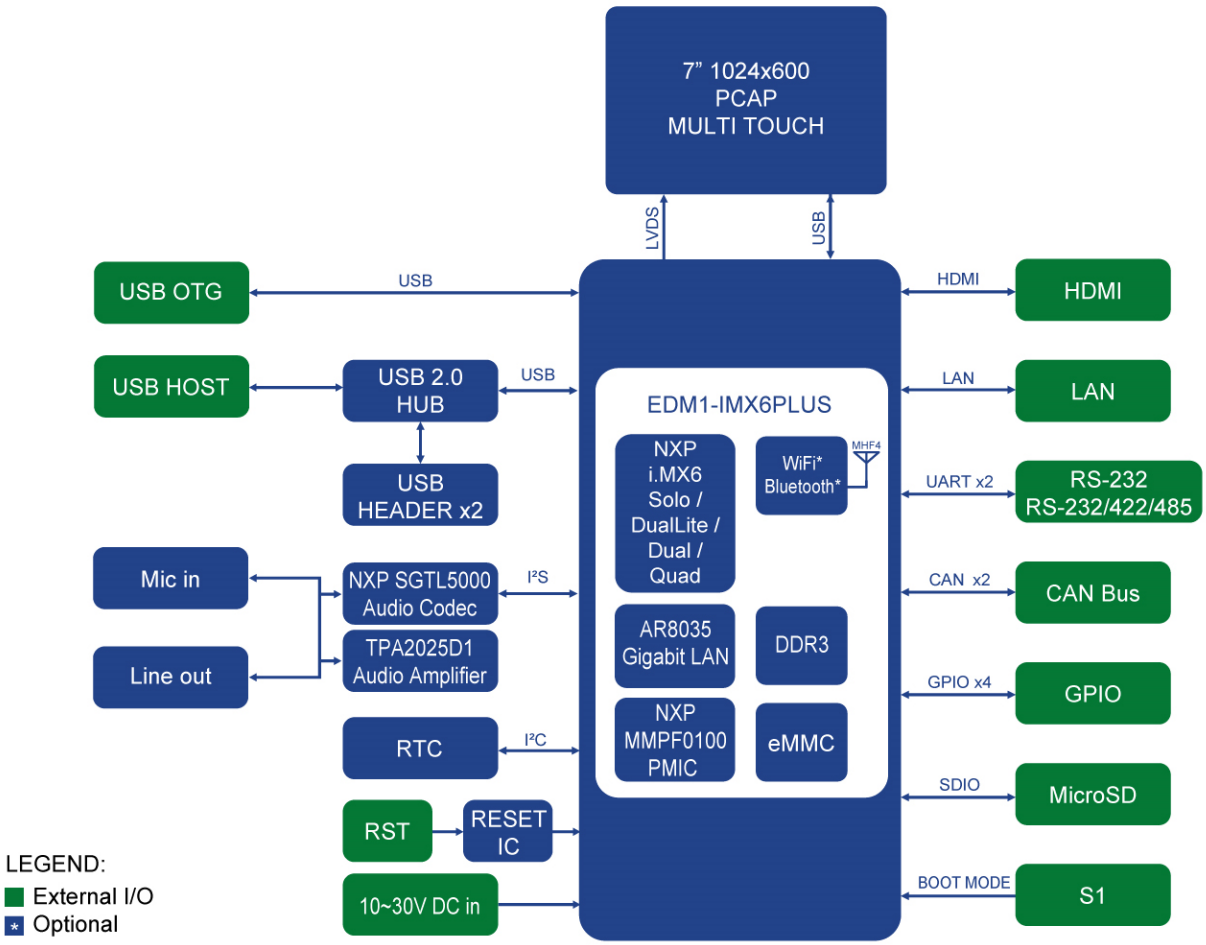
These suggestions apply equally to your device, battery, charger, or any enhancement. If any device is not working properly, take it to the nearest authorized service facility for service.
Regulatory information

Disposal of Waste Equipment by Users in Private Household in the European Union
This symbol on the product or on its packaging indicates that this product must not be disposed of with your other household waste. Instead, it is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or the shop where you purchased the product.

We hereby declare that the product is in compliance with the essential requirements and other relevant provisions of European Directive 1999/5/EC (radio equipment and telecommunications terminal equipment Directive).

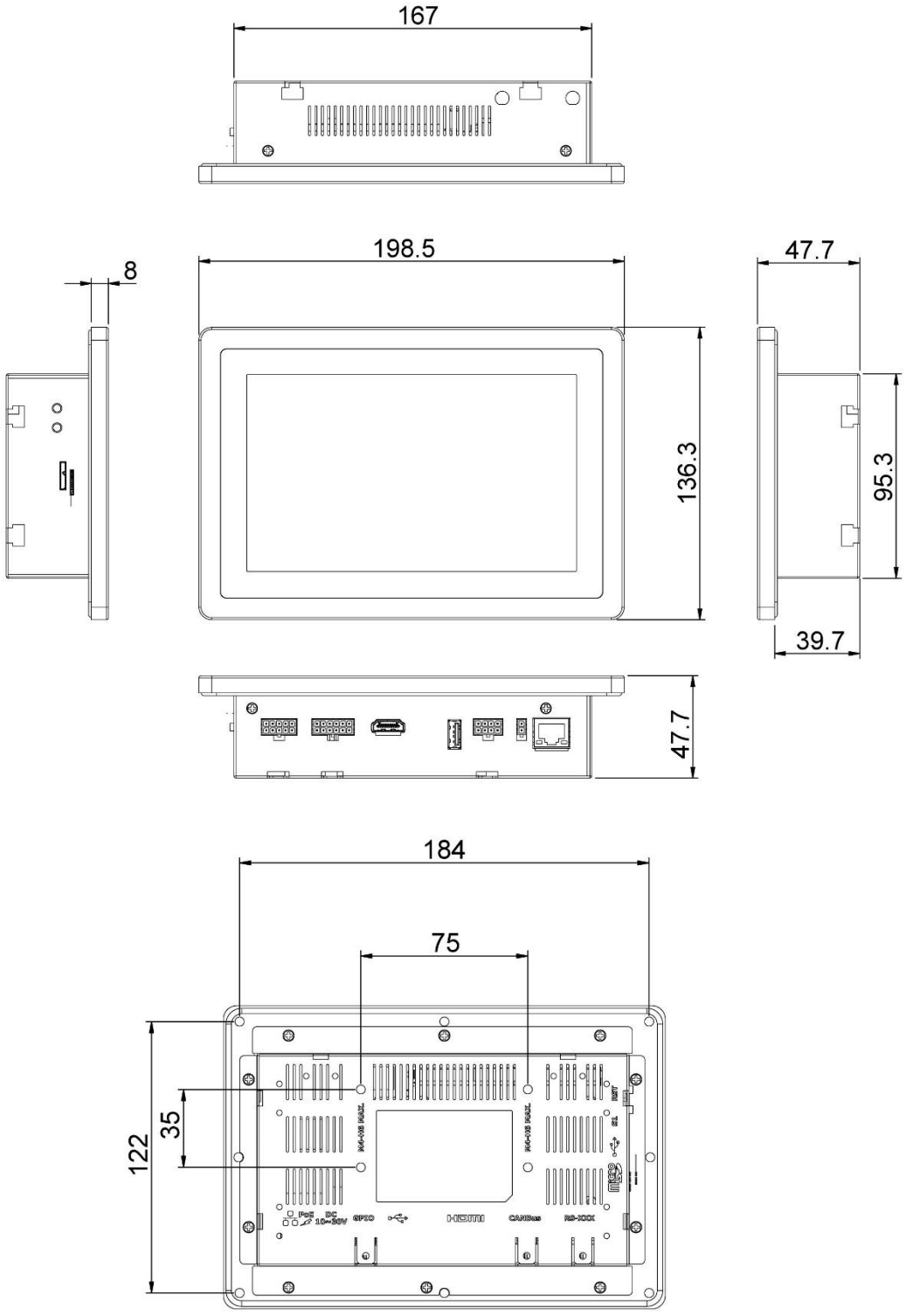
2. TC-0710 Product Overview

2.1. Functional Block Diagram



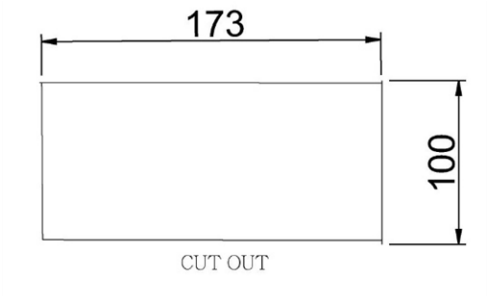
2.2. Dimensions

The following figure shows the TC-0710 dimensions (unit: mm):



2.3. Device Cut-out Dimensions For Mounting Though a Panel

The TC-0710 can be mounted on the front or the back of the panel. In order to mount it from the front, a nominal rectangular cutout must be made in the panel. The following drawing shows the dimensions of the cut-out area (unit: mm):



2.4. External Connectors

The TC-0710 has a number of external connectors.
Rear view:

External Connectors:

No.	Description	No.	Description
1	LAN RJ45 and PoE connector	7	Serial Port (RS-XXX) connector
2	Power Input (10~30VDC) connector	8	MicroSD cardslot
3	GPIO connector	9	USB OTG connector
4	USB Host connector	10	S1 Boot Select button
5	HDMI connector	11	Reset button
6	CAN Bus (CANBus) connector		

Bottom view:

Right side view:

External Connectors:

No.	Description	No.	Description
1	LAN RJ45 and PoE connector	7	Serial Port (RS-XXX) connector
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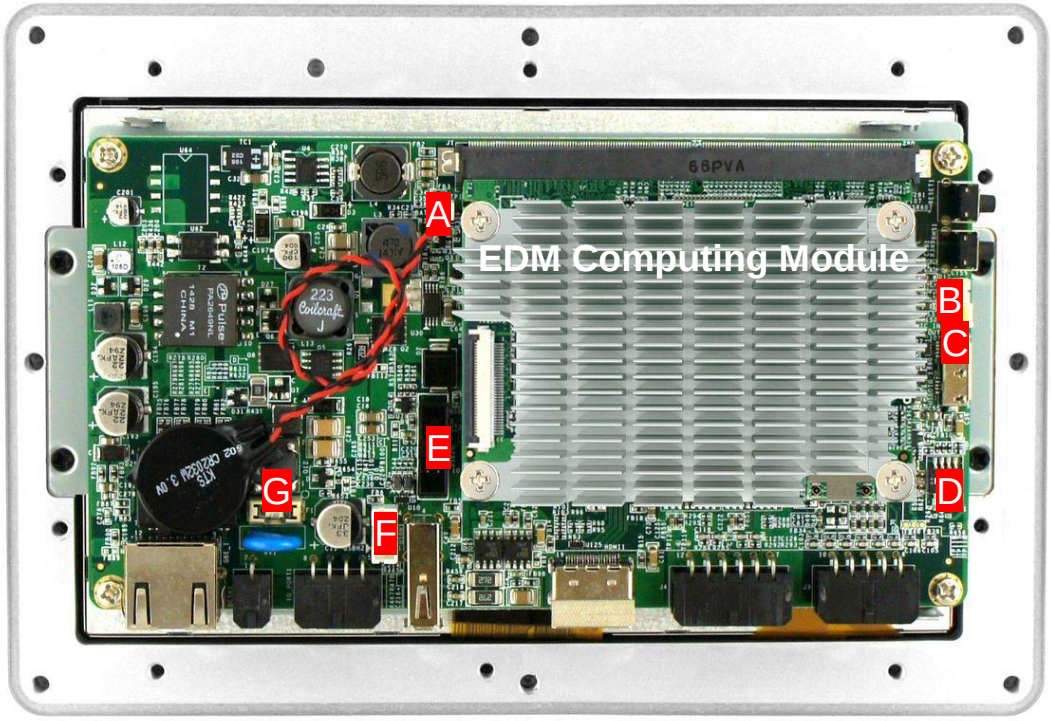
3	GPIO connector	9	USB OTG connector
4	USB Host connector	10	S1 Boot Select button
5	HDMI connector	11	Reset button
6	CAN Bus (CANBus) connector		

2.5. Internal Board Connectors

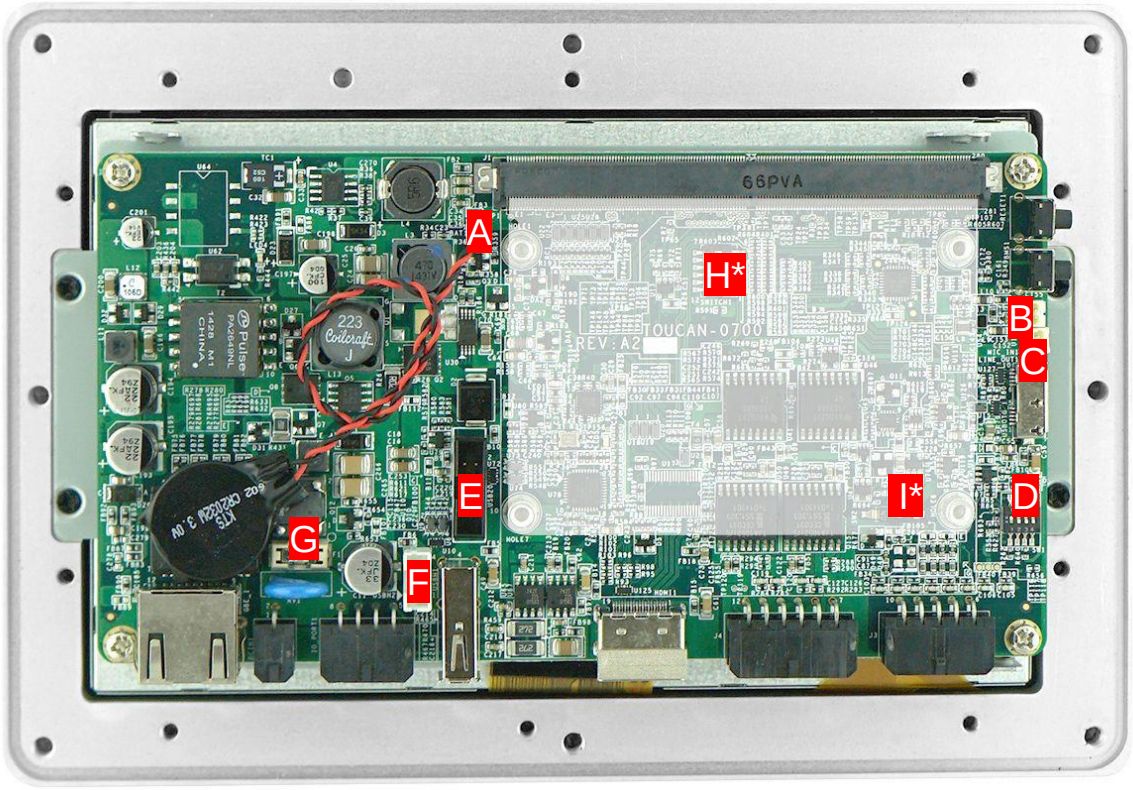
The TC-0710 has several connectors, switches and internal expansion options. It is necessary to remove the EDM computing module to access several switches, headers and connectors.
Rear view (opened device) with the EDM computing module:



Internal Connectors and Switches:

No.	Description	No.	Description
A	RTC Battery connector	E	USB (2 port) header
B	Mic in connector	F	USB (shared with touchpanel)
C	Line out connector	G	Power Fuse
D	SW1 DIP switch for RS-XXX Serial Port		

Rear view (opened device) without the EDM computing module:



Internal Connectors and Switches:

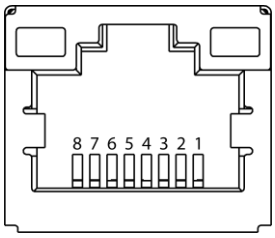
No.	Description	No.	Description
A	RTC Battery connector	F	USB (shared with touchpanel)
B	Mic in connector	G	Power Fuse
C	Line out connector	H*	Boot Select switch for S1 button
D	SW1 DIP switch for RS-XXX Serial Port	I*	SW2 MDB
E	USB (2 port) header		

NOTE: Items marked with * are accessible only after removing the EDM computing module.

3. External Connectors

3.1. Gigabit Ethernet Interface

The TC-0710 by default comes with a single Gigabit Ethernet RJ45 connector. This connector can support 802.3at Power over Ethernet functionality by connecting it to an 802.3at compliant PoE switch or power injector.

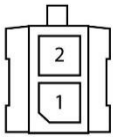


Pin #	1000 Mbps	100 Mbps	10 Mbps
1	MDI0+	Transmit Data+	Transmit Data+
2	MDI0-	Transmit Data-	Transmit Data-
3	MDI1+	Receive Data+	Receive Data+
4	MDI2+		
5	MDI2-		
6	MDI1-	Receive Data-	Receive Data-
7	MDI3+		
8	MDI3-		

3.2. Power Input Connector

The TC-0710 can be powered either over the DC INPUT connector or PoE over the RJ45 LAN port.

NOTE: Do not power the unit by DC input when you apply power over the Power over Ethernet (RJ45)!

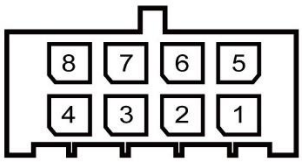


Pin #	Signal	Description
1	GND	Ground
2	VCC	DC Voltage input (10~30VDC)

Header on TC-0710: Molex 43045-0200 (2-pin Micro-Fit 3.0).
Cable receptacle: Molex 43025-0200 (2-pin Micro-Fit 3.0) plug with crimp contact Molex 43030-0007.

3.3. Digital I/O Connector (GPIO)

The TC-0710 has one galvanic isolated GPIO Expansion header with the following pinout:



GPIO:

Pin #	Signal	Description	Voltage			Current Max.	GPIO Kernel	GPIO Bank/IO
			Min.	Typ.	Max.			
1	GPIO1A	DIG_IN1		1.2V	1.4V	1A	90	6_31
2	GPIO1B	DIG_IN2		1.2V	1.4V	1A	191	3_26
3	GND_DIO	Ground for digital I/O						
4	GND	Common Ground						
5	GPIO1C	DIG_OUT5	5V		34V	1A	163	6_03
6	GPIO1D	DIG_OUT6	5V		34V	1A	24	1_24
7	VCC_DIO	Supply input for digital I/O	5V		34V			
8	VCC*	Supply output	10V		30V			

NOTE: * VCC supply output is based on the VDC input. There is no supply output when device is powered over the Power over Ethernet (RJ45)!

Header on TC-0710: Molex 43045-0800 (8-pin Micro-Fit 3.0).
Cable receptacle: Molex 43025-0800 (8-pin Micro-Fit 3.0) plug with crimp contact Molex 43030-0007.

3.4. USB Host Connector

The TC-0710 has a standard single USB Host connector (USB 2.0 signals only) to connect to a USB peripheral such as a keyboard, mouse, USB storage device or USB hub.

3.5. HDMI (High Definition Multi-Media Interface)

The HDMI interface available on the TC-0710 is based on the “HDMI transmitter” & “HDMI 3D TX PHY” integrated into the NXP i.MX6 processor and can be configured to support a secondary display.

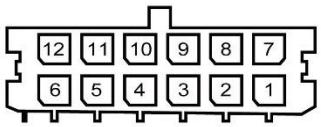
The HDMI supports the following standards & features:

- High-Definition Multimedia Interface Specification, Version 1.4a
- Digital Visual Interface, Revision 1.0
- HDMI Compliance Test Specification, Version 1.4a
- Support for up to 720p at 100Hz and 720i at 200Hz or 1080p at 60Hz and 1080i/720i at 120Hz HDTV display resolutions and up to QXGA graphic display resolutions.
- Support for 4k x 2k and 3D video formats
- Support for up to 16-bit Deep Color modes

For additional details, please refer to the “EDM1-CF-IMX6 Hardware Manual”.

3.6. CAN Bus Connector (CANBus)

The TC-0710 has two galvanic isolated CAN Bus interfaces with the following pinout:



CANBus:

Pin #	Signal	Description	Interface
1	GND_CAN	Ground for CAN	
2	CAN1A_TERM_P	To enable CAN1A Termination, bridge with CAN1A_P	can0
3	CAN1A_P	CAN Bus 1A high (-24~+24V)	can0
4	CAN1A_N	CAN Bus 1A low (-24~+24V)	can0
5	CAN1A_TERM_N	To enable CAN1A Termination, bridge with CAN1A_N	can0
6	NC		
7	GND_CAN	Ground for CAN	
8	CAN1B_TERM_P	To enable CAN1B Termination, bridge with CAN1B_P	can1
9	CAN1B_P	CAN Bus 1B high (-24~+24V)	can1
10	CAN1B_N	CAN Bus 1B low (-24~+24V)	can1
11	CAN1B_TERM_N	To enable CAN1B Termination, bridge with CAN1B_N	can1
12	NC		

Header on TC-0710: Molex 43045-1200 (12-pin Micro-Fit 3.0).
Cable receptacle: Molex 43025-1200 (12-pin Micro-Fit 3.0) plug with crimp contact Molex 43030-0007.

3.7. Serial Port / MDB Connector (RS-XXX)

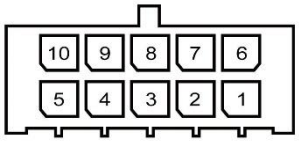
The TC-0710 has dual 4-wire galvanic isolated serial port that can be configured as follows: The primary serial port can only be used as a standard RS-232. The secondary port can be configured either as RS-232, RS-422, RS-485 or utilize MDB protocol. This serial port is set by default as RS-232. Setting the TC-0710 in other mode will require to open the device and adjust the internal SW1 DIP and SW2 switch settings on the Toucan circuit board. The SW1 DIP switch can be found at location “E” and SW2 at location “F” in chapter 2.5. Internal Board Connectors of this manual.

SW1:

Pin #	RS-232 (default)	RS-422	RS-485	MDB
1-8	ON	OFF	OFF	OFF
2-7	OFF	ON	OFF	OFF
3-6	OFF	OFF	ON	OFF
4-5	OFF	ON	ON	OFF

SW2:

Pin #	RS-232 (default)	RS-422	RS-485	MDB
1-2	OFF	OFF	OFF	ON



RS-232 + RS-232 (default setup):

Pin #	Signal	Description	Device
1	GND	Ground	
2	SERIAL1A_TXD	Port#1A Transmit data (output)	ttymxc0
3	SERIAL1A_RXD	Port#1A Receive data (input)	ttymxc0
4	SERIAL1A_RTS	Port#1A Request-to-send (output)	ttymxc0
5	SERIAL1A_CTS	Port#1A Clear-to-send (input)	ttymxc0
6	GND	Ground	
7	SERIAL1B_TXD	Port#1B Transmit data (output)	ttymxc1
8	SERIAL1B_RXD	Port#1B Receive data (input)	ttymxc1
9	SERIAL1B_RTS	Port#1B Request-to-send (output)	ttymxc1
10	SERIAL1B_CTS	Port#1B Clear-to-send (input)	ttymxc1

RS-232 + RS-422:

Pin #	Signal	Description	Device
1~5	SERIAL1A	Identical as above	ttymxc0
6	GND	Ground	
7	SERIAL1B+	RS-485 positive data signal	ttymxc1
8	NC		
9	NC		
10	SERIAL1B-	RS-485 negative data signal	ttymxc1

RS-232 + RS-485:

Pin #	Signal	Description	Device
1~5	SERIAL1A	Identical as above	ttymxc0
6	GND	Ground	
7	SERIAL1B+	RS-485 positive data signal	ttymxc1
8	NC		
9	NC		
10	SERIAL1B-	RS-485 negative data signal	ttymxc1

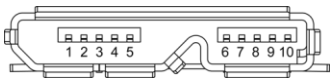
RS-232 + MDB:

Pin #	Signal	Description
1~5	SERIAL1A	Identical as above
6	GND	Ground
7	MDB_TXD	MDB transmit data signal (output)
8	MDB_RXD2	MDB receive data signal (input)
9	MDB_WakeUp	MDB wakeup signal (output)
10	MDB_VCC	MDB wakeup pull up VCC (0~5V)

Header on TC-0710: Molex 43045-1000 (10-pin Micro-Fit 3.0).
Cable receptacle: Molex 43025-1000 (10-pin Micro-Fit 3.0) plug with crimp contact Molex 43030-0007.

3.8. USB OTG Connector

The TC-0710 has one USB OTG connector (USB 2.0 signals only) that can be used to connect a host computer to the unit for programming and update purposes.



Pin #	Signal	Description
1	VBUS	5V Universal Serial Bus Power
2	USB_D-	Universal Serial Bus differential pair signal
3	USB_D+	
4	USB_OTG_ID	Universal Serial Bus On-The-Go detection signal
5	GND	Ground
6	NC	
7	NC	
8	GND	Ground
9	NC	
10	NC	

3.9. MicroSD Connector

The TC-0710 features a standard microSD cardslot which is connected to the NXP i.MX6 integrated “Ultra Secured Digital Host Controller” (uSDHC).

The following main features are supported by uSDHC:

- Compatible with the MMC System Specification version 4.2/4.3/4.4/4.41/5.0.
- Conforms to the SD Host Controller Standard Specification version 3.0.
- Compatible with the SD Memory Card Specification version 3.0 and supports the “Extended Capacity SD Memory Card”.
- Compatible with the SDIO Card Specification version 3.0.
- Supports 1-bit / 4-bit SD and SDIO modes

The MMC/SD/SDIO host controller can support a single MMC / SD / SDIO card or device.

3.10. S1 Button

The TC-0710 by default boots the unit from internal flash storage (eMMC). By pressing the “S1” button before applying power to the unit and keeping the button pressed for 10 seconds, the unit will boot from an alternative boot media, such as a microSD card. The primary and alternative booth media are determined by internal DIP switch settings. Please see section 4.4. S1 Button Boot Select Mode DIP Switch for more details.

3.11. RST Button

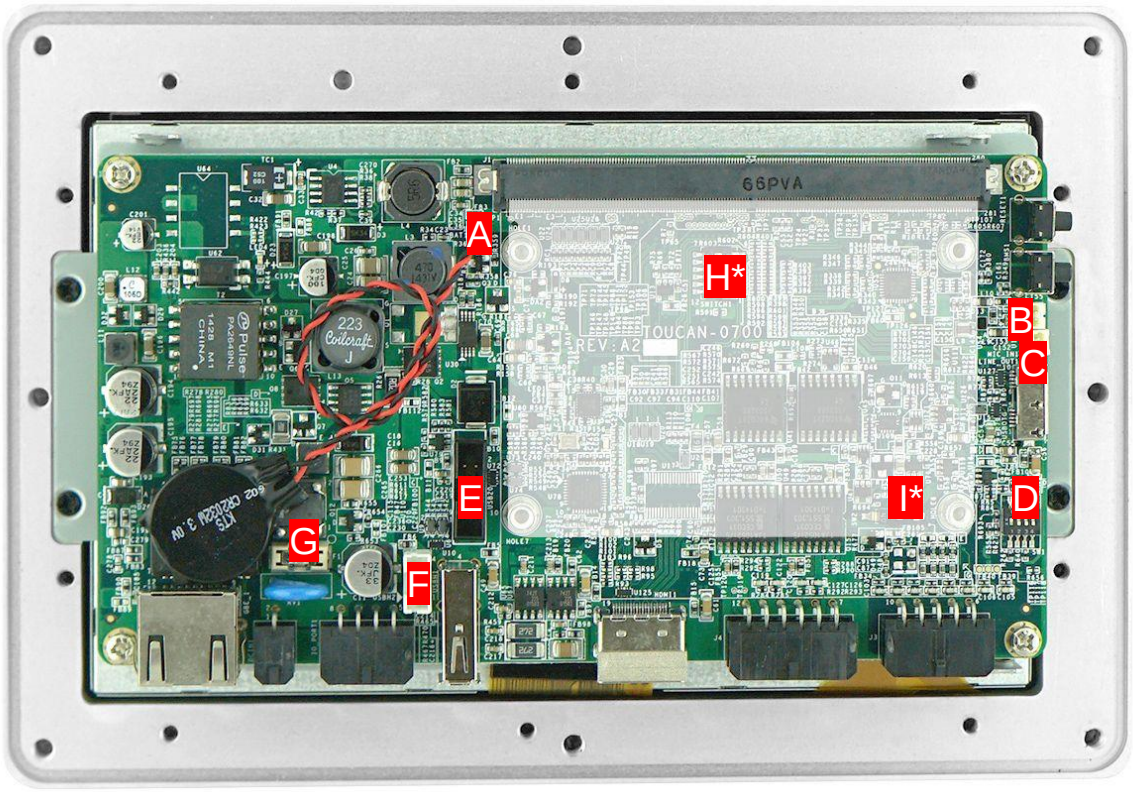
The TC-0710 features a “RST” button for system reset.

3.12. Antenna Holes

There are two antenna holes available (on the top side). They come fitted with breakaway metal tabs. In order to utilize them, the tabs must be removed by carefully using pincers or pliers.

4. Internal Connectors and Expansion Options

Rear view (opened device) without the EDM computing module:



Internal Connectors and Switches:

No.	Description	No.	Description
A	RTC Battery connector	F	USB (shared with touchpanel)
B	Mic in connector	G	Power Fuse
C	Line out connector	H*	Boot Select switch for S1 button
D	SW1 DIP switch for RS-XXX Serial Port	I*	SW2 MDB
E	USB (2 port) header		

NOTE: Items marked with * are accessible only after removing the EDM computing module.

4.1. RTC Battery Connector

The TC-0710 has an internal RTC backup battery connector (Marked A).

Pin #	Signal	Description
1	GND	Ground
2	RTC_VCC	3V (connect to standard CR2032 battery)

4.2. Audio Connectors

The TC-0710 has two internal audio connectors to connect a passive microphone or a speaker (Marked B and C respectively) The line out signal is pre-amplified with a 2W Texas Instruments TPA2025D1 amplifier.

Mic in (Marked B):

Pin #	Signal	Description
1	MIC	Microphone Signal
2	AGND	Microphone Ground Signal

Line out (Marked C):

Pin #	Signal	Description
1	SP+	Speaker Positive Signal
2	SP-	Speaker Analog Ground Signal

4.3. Power Fuse

The TC-0710 features a fast-acting square ceramic surface mount fuse Conquer SEF3A125V (Marked G) The fuse has the following current and voltage ratings: 3A at 125V.

4.4. S1 Button Boot Select Mode DIP Switch

The TC-0710 has an internal S1 Button Boot Mode Select DIP switch (Marked H).

Pin #	Boot from SD (default)	Boot from iNAND
1	ON	OFF
2	ON	OFF
3	OFF	ON
4	OFF	ON
5	OFF	ON
6	OFF	OFF

5. Mounting

This section describes the mounting procedures for TC-0710. The material in area of the mounting must provide sufficient strength for safe mounting of this device.

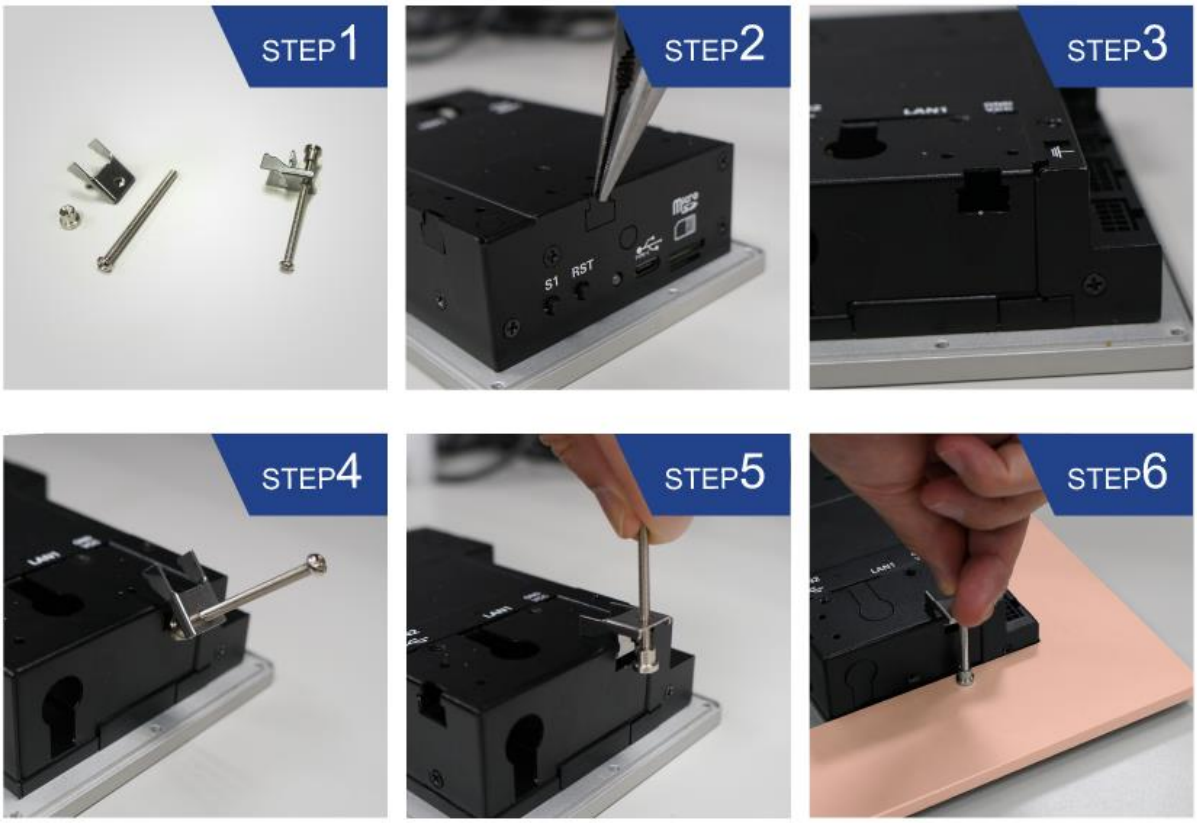
5.1. VESA Mounting

The TC-0700 is compatible with the VESA MIS-C Standard 35*75mm hole pattern. There are 4 VESA MIS-C (M4) mounting holes on the rear side of the device. M4 screw holes are a depth of 6mm.

5.2. Rear Mounting and Mounting Clips Installation

There are 6 mounting clips required for rear mounting.

Please follow the steps below to secure the clips. Prepare mounting hook, post and screw (M3) (Step 1). Locate all removable tabs on the rear side of your device and use pincers or pliers to remove the tabs (Step 2-3). Press the mounting clip into the holes at an angle and slowly straighten it (Step 4-5). Then tighten the screw to the surface (Step 6). Repeat the steps for all clips required to secure your device.



5.3. Surface Mounting and O-ring Installation

There are 8 mounting holes (M4) on the rear side of the device required for surface mounting. M4 screws with at least 6mm head-to-tip length are required to secure this device.

Please follow the steps below to properly install the waterproof rubber O-ring. Prepare your device and O-ring (Step 1-2). First, align the O-ring with the groove and press the O-ring into the corners of the O-ring groove (Step 3-4). Then, press it into the center (Step 5). Finally, stretch it uniformly around the O-ring groove (Step 6). Do not pull from one side, and make sure that you stretch it as little as possible.

6. Ordering Information

The TC-0710 is available in several configurations. Please contact your TechNexion sales contact window or distributor for options and availability details.

6.1. Custom Part Number Rule

The TC-0710 can be ordered in custom tailored configuration to meet special application requirements and conditions according to the following custom part number creation rules.
Custom part numbers carry minimum order quantities (MOQ). Please connect with your TechNexion distributor or account manager for conditions and availability. Part number format:

TC0710-P-IMX6x-Rxx-Exx-xxxx-xxxx

Interface	Code	Description
PMIC	P	NXP MMPF0100
Processor	IMX6S	NXP i.MX6Solo
	IMX6U	NXP i.MX6DualLite
	IMX6D	NXP i.MX6Dual
	IMX6Q	NXP i.MX6Quad
Memory	R05	512MB DDR3
	R10	1GB DDR3
	R20	2GB DDR3
Storage	E04	eMMC 4GB
	E08	eMMC 8GB
	EXX	eMMC other capacity
Wi-Fi / Bluetooth	-	-
	9377	Qualcomm QCA9377 802.11a/b/g/n/ac (2.4 + 5GHz) + Bluetooth 5
Custom ID	XXXX	Custom Part number ID for customized software loader and special component (BOM)

6.2. Standard Package Contents

Item	Partnumber	Description
1	TC-0710	7 inch PoE HMI PCAP touch system with NXP i.MX6
2	Accessoires	6x mounting hooks
		6x long screws (M3)
		6x mounting posts
		1x rubber O-ring
		1x DC power latch cable (2-pin Micro-Fit 3.0)

NOTE: Standard pack contents might vary depending on your ordered configuration.

7. Important Notice

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