

iW-G34H 7" HMI Panel



iW-RainboW-G34H-7" HMI Solution Hardware Datasheet



iW-G34H 7" HMI Panel Datasheet

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1 INTRODUCTION

1.1 Purpose

The document is a datasheet of the Rainbow series HMI solution based on i.MX8M Mini application processor. This solution is fully supported by iWave Systems Technologies Pvt Ltd. This datasheet provides information on overall hardware specification, software specification, mechanical dimension and subjected pre-compliance test cases.

1.2 Overview

The iW-G34H Series 7" HMI Panel is powered by i.MX8M Mini ARM™ Cortex Core-A53 based CPU and ARM Cortex-M4 core.

HMI BSP provided will be a collection of Tools, Binary, Source code and support files, these deliverables can be used to create a Linux Kernel Image and Linux Root file system for our HMI solution.

2. Technical Details

This section provides technical details of the hardware, software and mechanical aspect of HMI.

2.1 Block Diagram

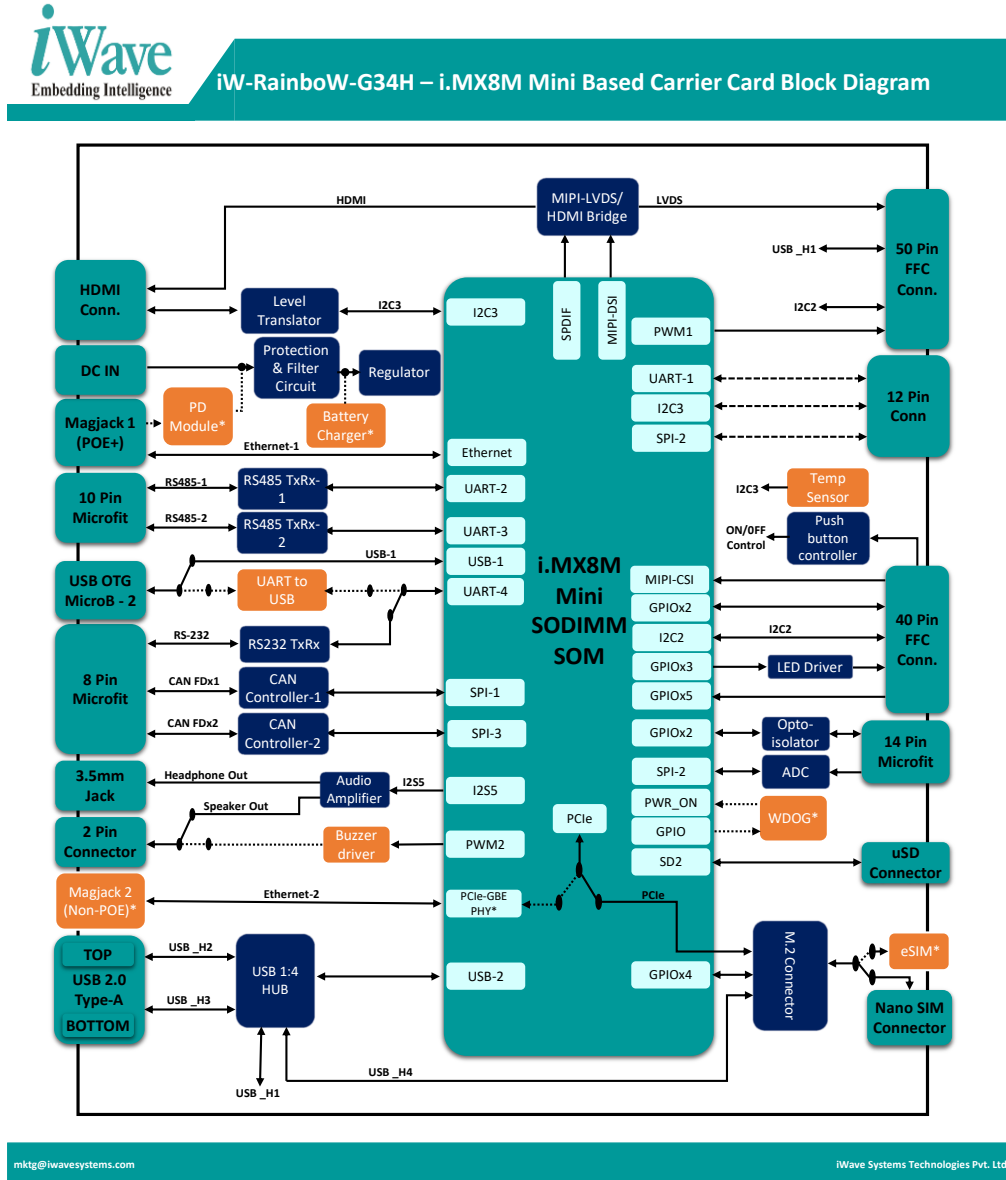


Figure 1: Block Diagram

NOTE:

*Optional Features will not be populated in the standard configuration. Please contact iWave Systems

1. 2 PIN Connector is shared between buzzer and speaker by default is speaker is connected.
2. UART 4 is shared between UART to USB converter & USB OTG by default USB OTG is supported.
3. UART1 is shared between 12 PIN connector and Bluetooth Module, by default it will be connected to Bluetooth Module.

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2.2 HMI Mechanical detail

This chapter contains illustrations of the HMI Mechanical Dimension.

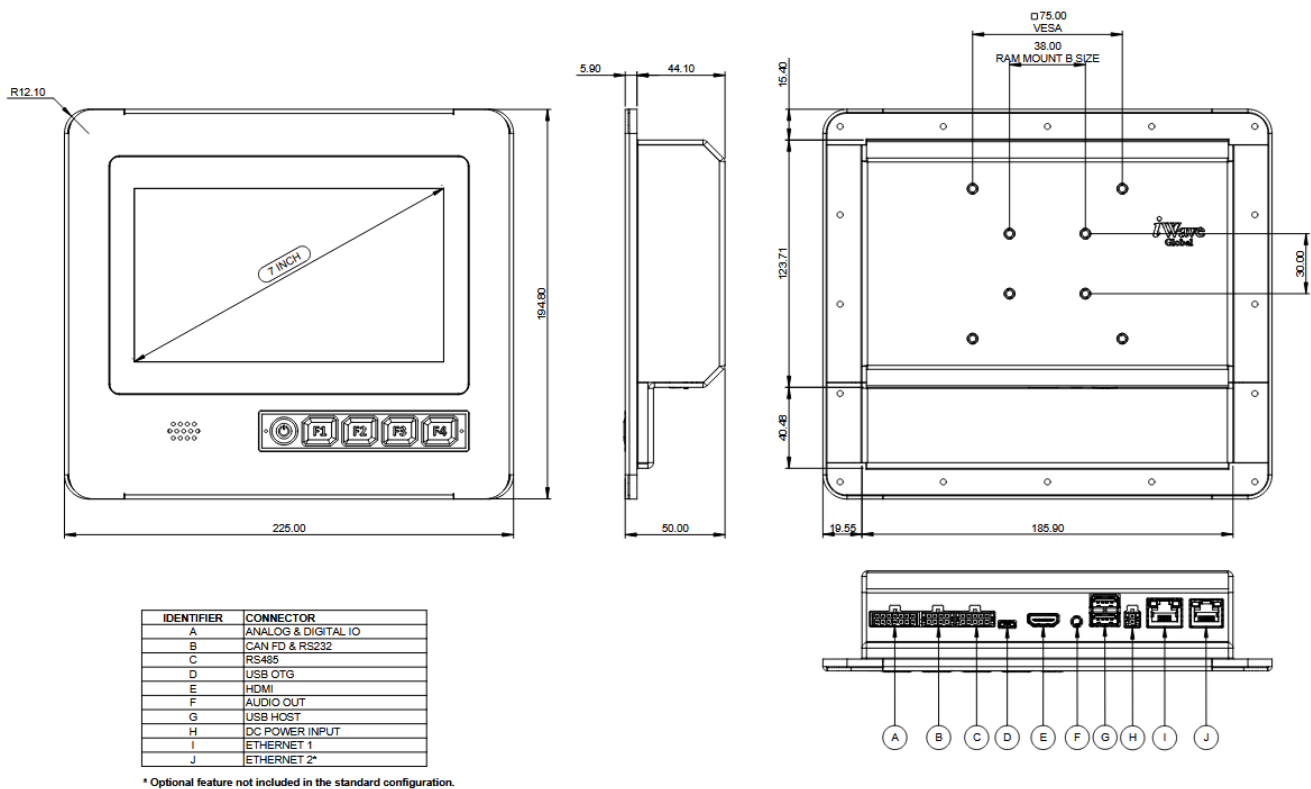


Figure 2: 7" HMI Dimension

Note:

All the dimensions are in mm

Enclosure design feature can change without any notice for improving product Feature.

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2.3 HMI Panel Specification

Table 1: HMI Specification

CPU	i.MX8M Mini Quad Core
Core Class & CPU Clock	Arm Cortex A53 & Cortex®-M4
Memory	
Flash Memory	8GB eMMC Flash
RAM	1GB/2GB –LPDDR4*
Micro SD card slot	4-bit MMC/SDIO/SD
Operating System	
Supported OS	Linux5.15.71
Communication Interfaces	
Ethernet-1	1x10/100/1000 Mbps Ethernet (RJ45) (POE*)
Ethernet-2	1x10/100/1000 Mbps Ethernet (RJ45) *
USB 2.0	2xUSB Host (Type A)
USB OTG	1xUSB OTG
CAN FD	2x CAN up-to 5Mbps data rate
RS485	2xRS485 up to 20 Mbps rate
RS232	1xRS232
Digital Input	Isolated Digital Input x 2 upto 36V (sinking)
Digital Output	Isolated Digital output x 2 upto 36V (sinking)
Analog Input	Analog Input x 4: 4-20mA or +/-12V
Camera	MIPI Camera*
RTC	RTC with Coin cell battery
HDMI	1xHDMI
Watchdog	Internal Watchdog Timer/External Watchdog Timer*
Keypad	Software configurable Keypad
Buzzer	Buzzers Indicator,3V,15mA,78 dB SPL*
Speaker	1xSpeaker
Battery	Battery for emergency data Backup*
Wireless Communication interfaces	
WIFI	IEEE 802.11 a/b/g/n/ac
Bluetooth	Bluetooth 5.0
Audio	
Audio	Line Out (3.5 mm Jack)
M.2 Expansion Slot	
M.2 Connector Key B (for LTE & positioning or SSD)	

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PCIe	PCIe 2.0 ×1
USB	USB 2.0 ×1
SIM	Micro SIM Connector /eSIM*
Peripheral Expansion	
Module Expansion connector	UART/i2C/SPI interface for Plug and Play wireless module & Sensor*
Enclosure	
Front Bezel	Aluminium
Back cover, heat Sink & Connector Plate	Aluminium
Ingress Protection	Front IP6x
7" HMI Weight	0.895 Kg (Approx)
Power Supply	
Power Input	12-36V DC external Supply
	Load Dump Protection (-36V -90V) * & PoE+ (IEE802.3at) *
Typical Environment condition	
Storage Temperature	-30°C to +80°C
Operating Temperature	-20°C to 70°C
Humidity	95% @ 40°C

* Optional Features will not be populated in the standard design and may have MOQ requirement. Please contact iWaveSystems.

Table 2: LCD Specification

Size	7"
Resolution	1024 x 600
Aspect Ratio	16:9
Brightness	850 cd/m ²
Backlight Life	Min 50K Hrs
Touch	PCA with Multi touch
LCD Type	IPS transmissive type

2.4 HMI Connectors

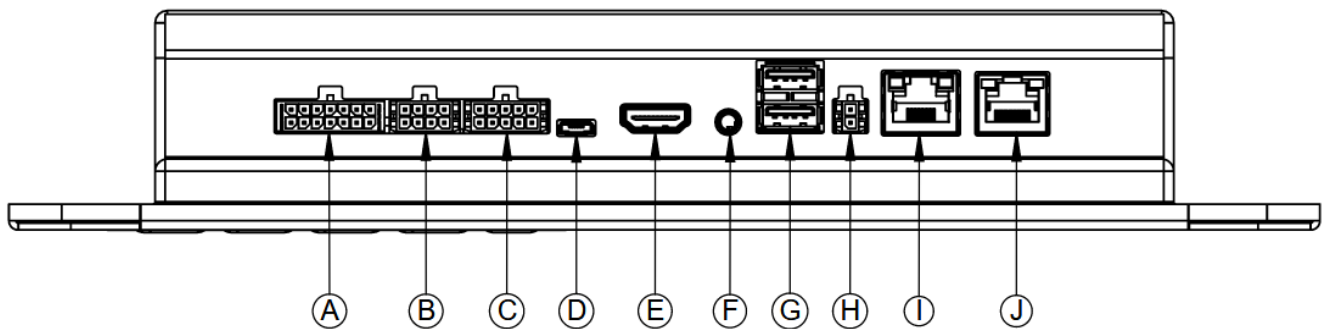


Figure 3: HMI Connectors

Table 3: HMI Connectors

Position	Description
A	Analog Input and Digital Input, Output Connector
B	RS232 & CAN FD Connector
C	RS485 Connector
D	USB OTG
E	HDMI
F	Audio Jack
G	USB Host
H	DC Power input
I	Ethernet 1 (PoE*)
J	Ethernet 2*

*Optional Feature not included in the standard configuration

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2.4.1 Power Input Connector

Connector part No: 66200221022

Mating connector part No: 662002113322

Supporting crimp part No: 66200313722DEC

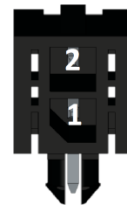


Table 4: Power Input Connector Pin Detail

Pin No	Signal Name	Signal Type	Signal Description
1	GND_IN	Power	Ground
2	VCC_DC_IN	Power	12-24V DC Supply.

2.4.2 RS485 Connector

Connector part No: 66201021022

Mating connector part No: 662010113322

Supporting crimp part No: 66200313722DEC

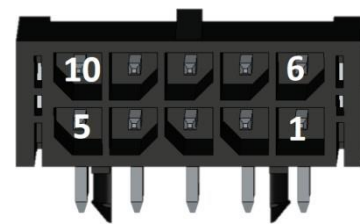


Table 5: RS485 Connector Pin Details

Pin No	Signal Name	Signal	Signal Description
1	RS485_TXY1	Differential	Positive Differential Output of Transceiver 1.
2	RS485_TXZ1	Differential	Negative Differential Output of Transceiver 1.
3	GND	Power	Ground
4	RS485_TXY2	Differential	Positive Differential Output of Transceiver 2.
5	RS485_TXZ2	Differential	Negative Differential Output of Transceiver 2.
6	RS485_RXA1	Differential	Positive Differential Input of Transceiver 1.
7	RS485_RXB1	Differential	Negative Differential Input of Transceiver 1.
8	GND	Power	Ground
9	RS485_RXA2	Differential	Positive Differential Input of Transceiver 2.
10	RS485_RXB2	Differential	Negative Differential Input of Transceiver 2.

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2.4.3 RS232& CAN Connector

Connector part No: 66200821022

Mating connector part No: 662008113322

Supporting crimp part No: 66200313722DEC

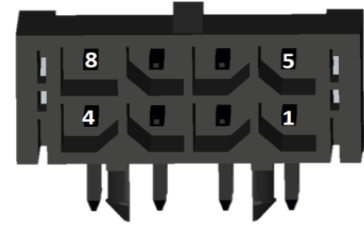


Table 6: RS232 & CAN Connector Pin Details

Pin No	Signal Name	Signal Type	Signal Description
1	RS232_RXD	Input	RS232 Receiver Input
2	GND	Power	Ground
3	CAN_H1	Differential	Differential Low signal of Transceiver 1
4	CAN_L1	Differential	Differential High signal of Transceiver 1
5	RS232_TXD	Output	RS232 Transmitter output
6	GND	Power	Ground
7	CAN_H2	Differential	Differential Low signal of Transceiver 2
8	CAN_L2	Differential	Differential High signal of Transceiver 2.

2.4.4 Analog Input and Digital Input, Output Connector

Connector part No: 66201421022

Mating connector part No: 662014113322

Supporting crimp part No: 66200313722DEC

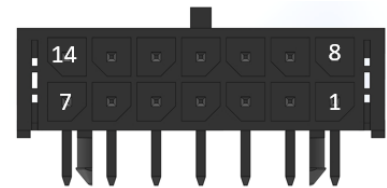


Table 7: Analog Input and Digital Input, Output Connector

Pin	Signal Name	Signal Type	Signal Description
1	DIO_VCC	Power	Digital Output Power.
2	DOUT2	Output	Sinking digital output 2
3	DIN1+	Input	Sinking digital Input 1
4	IN_AIN0	Input	Analog Input 0
5	IN_AIN1	Input	Analog Input 1
6	+VCC_15V	Power	Analog Input +ve Supply
7	-VCC_15V	Power	Analog Input -ve Supply
8	DIO_GND	Power	Digital IO Ground
9	DOUT1	Output	Sinking digital output 1
10	DIN2/DIN1-	Input	Sinking digital Input 2
11	AGND	Power	Analog Signal GND
12	IN_AIN3_N	NC/ Differential	NC / Differential Analog input -Ve
13	IN_AIN3_P	Input	Analog Input 3 / Differential Analog input +Ve
14	IN_AIN2	Input	Analog Input 2

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2. 4.5 M.2 Connector Details

Connector Part No: 2199230-3.

M.2 Connector supports PCIe /USB 2.0/UIM interfaces.

M.2 is primarily targeted for board types 2242 and 3042 board sizes and Supports PCIe based SSDs, USB or PCIe based WWAN (LTE, GPS).

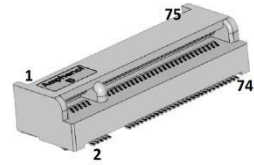


Table 8: M.2 Connector Pin Detail

Pin No	Signal Name	Signal Type	Signal Description
1	NC	No Connection	No Connection
2	VCC_3V3_M.2	Power	3.3V Power Input
3	GND	Power	Ground
4	VCC_3V3_M.2	Power	3.3V Power Input
5	GND	Power	Ground
6	M.2_POWER_ON_OFF	IO, 3.3V CMOS	Card On-Off
7	USB_DP_LTE	Differential	USB Data Positive.
8	LTE_DISABLE	IO, 3.3V CMOS	LTE Disable
9	USB_DN_LTE	Differential	USB Data Negative.
10	NC	No Connection	No Connection
11	GND	Power	Ground
12	NC	No Connection	No Connection
13	NC	No Connection	No Connection
14	NC	No Connection	No Connection
15	NC	No Connection	No Connection
16	NC	No Connection	No Connection
17	NC	No Connection	No Connection
18	NC	No Connection	No Connection
19	NC	No Connection	No Connection
20	NC	No Connection	No Connection
21	NC	No Connection	No Connection
22	NC	No Connection	No Connection
23	NC	No Connection	No Connection
24	NC	No Connection	No Connection
25	NC	No Connection	No Connection
26	GNSS_DISABLE_CONN	I, 1.8V	GNSS Disable
27	GND	Power	Ground
28	NC	No Connection	No Connection
29	NC	No Connection	No Connection
30	USIM_RST	I,1.8V	UIM clock RESET.
31	NC	No Connection	No Connection
32	USIM_CLK	I,1.8V	UIM clock signal.

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33	GND	Power	Ground
34	USIM-DATA	IO,1.8V	UIM clock signal.
35	NC	No Connection	No Connection
36	USIM_VDD	I,1.8V	Power source for the
37	NC	No Connection	No Connection
38	NC	No Connection	No Connection
39	GND	Power	Ground
40	NC	No Connection	No Connection
41	PCIE_RXP	Differential	PCEI Receive Negative
42	NC	No Connection	No Connection
43	PCIE_PXM	Differential	PCEI Receive Positive
44	NC	No Connection	No Connection
45	GND	Power	Ground
46	NC	No Connection	No Connection
47	PCIE_TXM	Differential	PCle Transmit Negative
48	NC	No Connection	No Connection
49	PCIE_TXP	Differential	PCle Transmit Positive
50	MAIN_RESET#	I,3.3V	PCle RESET
51	GND	Power	Ground
52	PCIE_CLKREQ_B	IO,3.3V	PCle Clock Request
53	PCIE_REFCLK_DM	Differential	PCle Reference Clock
54	PCIE_WAKE#	IO, 3.3V CMOS	PCle Wake
55	PCIE_RECLK_DP	Differential	PCle Reference Clock
56	NC	No Connection	No Connection
57	GND	Power	Ground
58	NC	No Connection	No Connection
59	NC	No Connection	No Connection
60	NC	No Connection	No Connection
61	NC	No Connection	No Connection
62	NC	No Connection	No Connection
63	NC	No Connection	No Connection
64	NC	No Connection	No Connection
65	NC	No Connection	No Connection
66	SIM_CARD_DET	I,1.8V	SIM card Detection
67	M.2_RESET_CONN	O,1.8V	Card Reset
68	NC	No Connection	No Connection
69	NC	No Connection	No Connection
70	VCC_3V3_M.2	Power	3.3V Power Input
71	GND	Power	Ground

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72	VCC_3V3_M.2	Power	3.3V Power Input
73	GND	Power	Ground
74	VCC_3V3_M.2	Power	3.3V Power Input
75	NC	No Connection	No Connection

2.5 Standard Connectors

In this section, the standard connector's part numbers are mentioned. All connector pinouts are as per industry standards.

Table 10: Standard Connectors Detail

Interface	Connector Description	Connector Part No
USB OTG	Micro USB Type AB Connector	47589-0001
USB 2.0 Host	USB Type A right angle stack connector	72309-8034BLF
Ethernet Port-1*	RJ45 PoE Magjack Connector	7499511440
Ethernet Port-2	RJ45 Magjack Connector	7499111447
Micro SD	Push-Push type 10pin Connector	GTFP08431BEU
Audio Out	3.5 mm Jack	SJ-3523-SMT-TR
Micro SIM	Hinged Micro SIM Connector	78800-0001
HDMI	HMDI Connector	685119134923

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2.6 Software Specification

iWave HMI deliverables include BSP for Linux and libraries for GUI development.

Linux is a family of free and open-source software operating systems. Yocto framework is used for Linux based HMI. Linux 5.15.71 kernel and 2022.04 Uboot loader versions are used in Linux BSP.

As our BSP comes with pre-integrated Open-source GUI libraries and SDK which helps the user to build a rich and interactive GUI on iWave's HMI platform.

2.7 BSP Contents and Features

BSP offers flexibility to incorporate Industrial protocols, open-source protocols and applications for any automated GUI Applications. Depending on customer OS requirement (Linux) corresponding Linux BSP.

Table 11: BSP Contents

Items	Name	Description
Kernel	Linux 5.15.71	Linux Source code based on Linux 5.15.71version
Boot loader	U-Boot 2022.04	Primary Boot Loader program
File System	Yocto 4.0 Kirkstone	Linux file system
Tool Chain	GCC 11.3.0	Cross Compiler Tool
Tool	UUU Tool	Flashing Tool
Binaries for Linux	Flash.bin, Image & DTB Rootfs	U-Boot Image, Kernel images and Device Tree Binaries, Linux File System

Table 12: BSP Features

Items	Name	Description
Boot loader	U-Boot 2022.04	Primary Boot Loader Program.
OS	Linux 5.15.71	Linux OS.
	USB	USB driver with Host and OTG support.
	Ethernet	Ethernet Driver with TCP/IP protocol support.
	SDHC	SDHC driver.
	Wi-Fi (SPI/SDIO)	802.11 a/b/g/n/ac Wi-Fi Host-Client support.
	Bluetooth (UART)	BLE 5.0 with GAP, GATT & ObexFTP profile.
	Touch	Capacitive Multi Touch driver.
	UART	RS232, RS485 (full/half duplex).
	SPI	SPI driver.
	I2C	I2C driver.
	PWM	PWM Brightness Control & Buzzer driver provided
	GPIO	GPIO driver.

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Drivers supported in Linux	Watchdog	System watchdog driver.
	Audio	Audio line-out support.
	LVDS	LVDS display driver.
	DIO	Digital Input and Digital Output driver
	ADC	Analog Input
	MIPI Camera	MIPI CSI Driver support*
	Keypad	Software configurable keypad
	Buzzer	PWM-Buzzer driver support*
	Speaker	Stereo Headphone & Mono Class-D speaker support
	PCIe	NVM Express block device driver support
	GPS	GNSS support
	4G	LTE support
	CAN FD	TCAN4X5X driver support
Linux Library/Packages/ Applications	QT OPEN-Source Libraries	XWayland with QT 5.15 Libraries
	Multimedia Applications	Gstreamer and Image viewer are supported.
	Python	Python language feature is provided
	OpenSSL Libraries	OpenSSL library is provided.
	OpenCV Libraries	OpenCV library is provided.
	OpenCL Libraries	OpenCL Libraries is provided.
	OpenGL ES Libraries	OpenGL ES library is provided
	GCC 11.3.0	A cross-compiler tool to develop Application
	Supported Protocols	CAN FD & Classic CAN
	Security Features	OPTEE (Arm TrustZone architecture)

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2.8 Ordering Information

Part Number	Description
iW-G34H-04CI-4L01G-E008G-07CA-ACAC-L	7" Display Panel HMI with Capacitive touch, i.MX 8M mini, 1GB LPDDR4 , 8GB eMMC, Aluminum enclosure, Wi-Fi and 1X Ethernet, Linux, Industrial Grade
iW-G34H-04CI-4L02G-E008G-07CA-ACAC-L	7" Display Panel HMI with Capacitive touch, i.MX 8M mini, 2GB LPDDR4 , 8GB eMMC, Aluminum enclosure, Wi-Fi and 1X Ethernet, Linux, Industrial Grade

Note: Some Product Part Numbers are subject to MOQ & for different CPU and memory configurations, contact iWave systems.

