Technical Specification

DPL-HC70-iMX

Version 1.0
Document Date: June 13, 2022

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DPL-HC70-iMX

LCD

Item	DPL-HC70-iMX
Screen Size	7.0 inch
Display Resolution	1024 x RGB x 600 dots
Active Area	154.2144 (H) x 85.92 (V) mm
Display Mode	Normally black / Transmissive
Pixel Arrangement	RGB-Strip
Display Color	16.7 M (Display) / 64k (Controller)
Backlight [1]	27 white LEDs, typical lifetime 50.000 hours
Brightness typ.	600 cd/m^2
Contrast ratio typ.	800
Viewing Direction	ALL O'clock
Touch Screen	PCAP 5 Fingers

Note:
[1] Brightness decreased to be 50% of the initial value. Life time; mean time before failure at normal temperature (25°C) and normal humidity (60%)

Electrical Characteristics

Item	Symbol	Min.	Typ.	Max.	Unit
Supply Voltage	V_{CC}	4.5	5.0	5.25	V
Input Voltage H Level [1]	V_{IH}	2.4	-	3.3	V
Input Voltage L Level [1]	V_{IL}	0.0	-	0.8	V
Output current for digital outputs	I_{OUT}			3.5	mA
Vbatt current	I_{Vbatt}		1		µA
Current consumption display on, backlight off @ V_{CC} = 5V [2][3]	I_{CC}		750		mA
Current consumption with display+backlight @ V_{CC} = 5V [2][3][4]	I_{CC}		1300	1600	mA

Notes:
[1] For digital inputs only
[2] No I/O ports active
[3] All pixel set to white color
[4] Backlight intensity 100%

Circuit Board
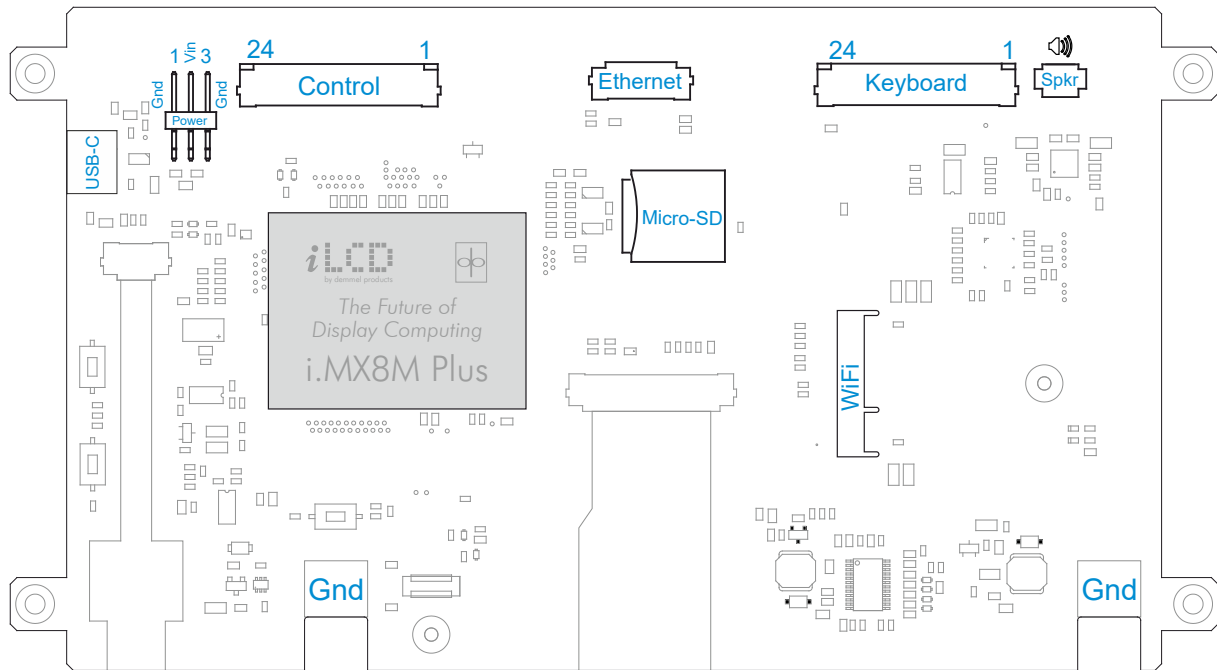
DPL-HC70 connections (view from PCB side), see Pin Descriptions

Mechanical Specification

Item	DPL-HC70-iMX	Unit
Module Dimension (without mounting brackets)	160.0 x 99.96±0.3	mm
Module Dimension (incl. mounting brackets)	182.0 x 99.96±0.3	mm
Total Module Thickness	15.5	mm

99.96 ± 0.3 (Module outline)
99.6 ± 0.2 (CTP outline)
86.72 ± 0.2 (CPT active area)
85.92 (LCD active Area)
10.0
8.0
80.0
8.0
4.40 ± 0.3
4.75 ± 0.3
3.51 ±0.3
3.72 ±0.3

Flexcable
LCD

Flexcable
CTP

182.0 (Total width including mounting brackets)
175.0

165.0 (Module outline)
164.50 (CTP outline)
154.88 ±0.2 (CTP active area)
154.2144 (LCD active area)

CTP

LCD
metal
frame

Controller
board

SOM

USB Type C
connector

FFC
connector

max. 15.5 incl.
components
5.1 ±0.2
1.6

Common Features

Memory

Item	Properties
Processor	i.MX8M-Plus
RAM	2 GB LPDDR4 (32-bit channel)
Flash	16 GB eMMC
EEPROM	8 kbit/ 2-wire I²C
External Memory	Micro SD socket
RTC	ultra-low-power AM1805 real time clock

Connectivity

Item	Properties
USB	2 x USB 3.0
Ethernet	10/100/1000 Mbit/s
Serial	RS-232/RS-485

Maximum Ratings & Power Supply

Item	Symbol	Minimum	Maximum	Unit
Supply Voltage	V_{CC}	-0.3	5.5	V
Input Voltage	V_{IN}	-0.3	3.3	V
Operating Temperature [1]	T_{OPR}	0	70	°C
Storage Temperature	T_{STR}	-40	85	°C
Humidity [2]		10	90	%RH

Notes:
[1]   Lifetime of backlight LEDs will be decreased for temperatures   50°C
[2]   Temp.   60°C, 90% RH MAX.
      Temp.   60°C, absolute humidity shall be less than 90% RH at 60°C

The ground connection to the display should be as stable as possible. Especially for iLCDs with projected capacitive touch panel the ground connection to the display and the power supply is crucial for a error-free function. If it is not possible or not wanted to connect the power supply with protective earth, this shall be done via a 20 nF capacitor.

Note: The mounting brackets on the iLCD panels are also connected with the PCB's GND plane.

Quality Standards

Dust Particles

The TFT display modules are assembled under clean room conditions. The following table specifies the allowed number and size of particles incorporated.

Dimension (Diameter D)	Acceptance (Qty N)
D 0.25 mm	Ignored
0.25 D 0.50	N 5
D 0.50	0
Total	N 5
Dimension (Diameter D)	Acceptance (Qty N)

Pixel Failures

For our iLCD Panels we deploy A-grade TFT display modules. We accept a maximum of sub-pixel failures as follows:

Defect Type	Acceptance (Qty N)
Bright Dots	N = 0
Dark Dots	N ≤ 3
Total	N ≤ 3

Assembly

Treatment of the Touch Panel Tail

The touch panel is connected to the iLCD processor via an FPC tail. It is mounted already on iLCDs with touch functionality. In order to guarantee correct function and to prevent physical damages, please observe the following notes when taking out the iLCD panels from the package and during manufacturing:
- Do not exert lateral or shearing forces on the tail. This can happen when fitting the iLCD panel into a housing through a narrow aperture.
- Do not crease, twist or pull the tail.
- Do not touch the tail conductors.

Treatment of the FFC Tail

The FFC cable connects the iLCD to the application electronics.
- The FFC cable bending radius must be ≥ 3 mm.
- Do not exert lateral or shearing forces on the FFC cable.
- Do not crease or twist the FFC cable.

iLCD Rear Mount Integration

One integration method is mounting the iLCD behind a bezel with a rectangular cut out. Rubber or foamed rubber gaskets (cushion) hereby ensure a balancing of tolerances and an environmental sealing. The bezel edge shall be positioned between the LCD Active Area and the View Area. If the bezel edge touches the LCD Active Area, it may press the resistive touch panel unintendedly and cause activation. A gap of approximately 0.5 mm is needed between the bezel and the top electrode. It may cause unexpected activation if the gap is too narrow. There shall be a distance from the panel edge of minimum 1.0 mm for TPC tail protection.
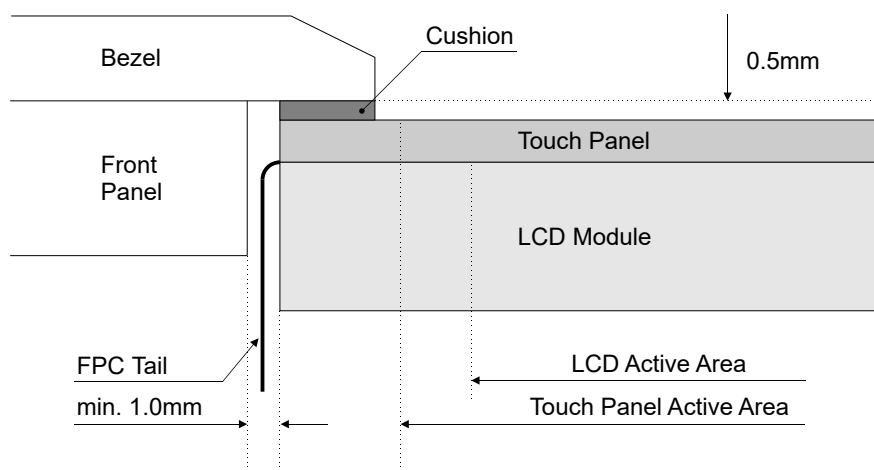
Compliance with EU Regulation

demmel products gmbh declares compliance with the applicable RoHS directive and REACH regulation:

▪ Restriction of the use of certain Hazardous Substances (RoHS), directive 2011/65/EU

▪ Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), regulation EC No 1907/2006

We provide the declarations of conformity for each of our products upon request – please contact us.

Module Function Description

General Information about Port Pins

The pin specifications will be updated shortly.

Pin Descriptions

Power Connector (Power)

The iLCD panels can either be supplied via the Power Connector, via the Control Port or via the USB Port. If supplied via the 24-pin Control Port, all three GND pins must be connected and all three VCC pins must be connected so as not to exceed the maximum allowed current per pin of the FFC/FPC connector. Please note that if the iLCD panel is supplied via USB, its output current must at least fulfill the requirements listed in the electrical characteristics of the panel. Furthermore, ensure that the USB port delivers a stable and sufficient voltage level according to the iLCD specifications.

Pin #	Pin Name	Direc-tion	Primary Function Description
1	GND [1]	-	Ground pin
2	VCC [2]	-	5V power supply
3	GND [1]	-	Ground pin

WARNING! Reversed power supply connections (Vcc and Gnd) made to the iLCD module or invalid power supply voltage greater than 5.5V will cause module damage.

Control Port (Control)

Connection to the control port is made via a 24-pin FFC/FPC cable with 1.0 mm pitch. The FFC/FPC connector on the board is a top-contact model. The pin specifications will be updated shortly.

Pin #	Pin Name	Direc-tion	Primary Function Description
1	tbd	tbd	tbd

Note:
[3]

WARNING! Reversed power supply connections (Vcc and Gnd) made to the iLCD module or invalid power supply voltage greater than 5.5V will cause module damage.

Keyboard Port (Keyboard)

Connection to the keyboard port is made via a 24-pin FFC/FPC cable with 1.0 mm pitch. The FFC/FPC connector on the board is a top-contact model. The pin specifications will be updated shortly.

| Pin #	Pin Name	Direc-tion	Primary Function Description
1	tbd	tbd	tbd

Note:
[1])

USB-C Port (USB-C)

The iLCD panels can be connected via USB either via the onboard USB-C connector or via the control port's USB pins, limited to one connection at a time. Additionally, the iLCD panel can be supplied via USB, in which case its output current must at least fulfill the requirements listed in the electrical characteristics of the panel. Furthermore, ensure that the USB port delivers a stable and sufficient voltage level according to the iLCD specifications.

MicroSD Connector (Micro-SD)

All iLCD panels have a MicroSD card holder on-board. A MicroSD card with up to 32 GBytes may be inserted. Please note that MicroSD and MicroSDHC are supported.

To insert a MicroSD card, slide the connector in the direction of the OPEN-arrow engraved in the metal plate and lift it. Insert the card with the contact area facing down, then fold the connector back in and push carefully in the direction of the LOCK-arrow until it makes a click sound.
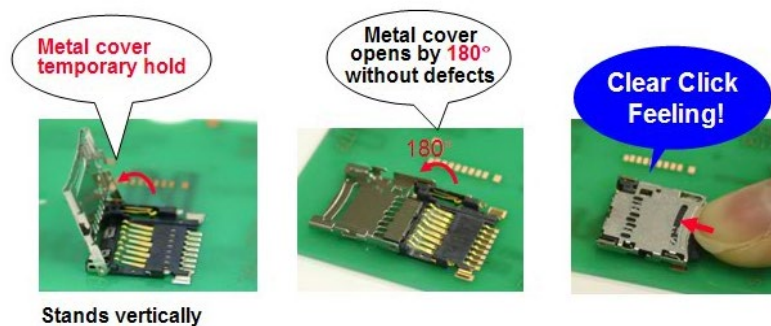
Wifi Port (WiFi)

An external WiFi Module may be added to the iLCD Linux panel via this connector. It conforms with the M.2 Key-E standard, which is physically incompatible with most other M.2 standards.
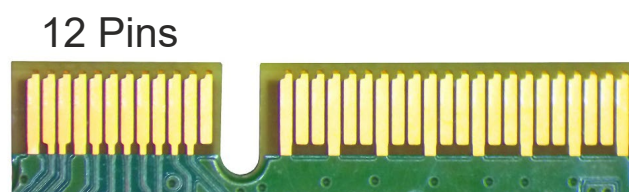
M.2 Key-E Connector

Speaker Port (Spkr)

The speaker output may be connected directly to a 4 or 8 Ohm speaker to play sound files.

<u>Revision History</u>

Date	Rev. #	Revision Details
June 1, 2022	1.0	Initial release

If you find any errors in this document, please contact demmel products at <u>support@demmel.com</u>