demmel products offers
all-in-one solutions

The Future of Display Computing

Exceeding Expectations
in Display Quality

LCD pure
by demmel products

LCD pure
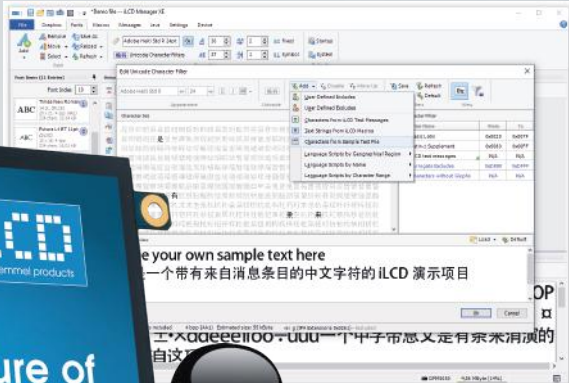
for intelligent displays and high-end LCDs

iLCD
by demmel products

demmel
products

From humble beginnings …

demmel products is synonymous with well-designed and innovative hardware and software solutions. Since our establishment in 1988, we've provided our customers with cutting-edge technology that simplifies development, enhances security and accelerates innovation. In 2004, we hit a significant milestone when we introduced the predecessor to our current "JPro Series". It is said that the whole is more than the sum of its parts and this principle is embodied perfectly in this groundbreaking system, in which display and electronics are combined with an intuitive GUI for rapid development, compact form factor and beautiful design.

The idea for the JPro Series is summed up perfectly by our founder, Herbert Demmel, when he says: "Our iLCDs make it easier for developers by reducing development time and complexity, allowing them to focus on customizing their applications without the hassle of integrating displays electronically." This guiding principle applies to all of our product lines and is our USP.

Our solutions have been successfully employed in vastly different industries such as mechanical engineering, medical technology, measurement technology, electrical engineering, the automotive sector, and more. In this brochure, you'll find concise presentations of each of our product lines, starting with a comprehensive exploration of the challenges and opportunities inherent in employing an intelligent display solution.
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iLCD Linux Series
The Future of Display Computing

... to the cutting edge of display technology

Herbert Demmel, Founder & CEO

Clemens Salomon, CEO

*You need to integrate a display,
we offer a solution. Our wide portfolio
of HMIs helps our customers
reduce development efforts while
upgrading their applications."*

demmel products

Why use intelligent displays?

Advantages of using Intelligent Display Modules as HMIs

In recent years, the demand for display interfaces for human-machine communication has skyrocketed. Many companies have started replacing their LEDs, push buttons and segment displays with color LCDs and touch panels, opening up entirely new possibilities for their customers to interact with their products.

"Ready-to-Run"

When considering how specifically to integrate a display interface into your application, the following question invariably arises: should you opt for a "bare" display without peripherals, or a ready-to-use intelligent display module? This fundamental design decision will affect every aspect of your workflow and has to be made on a project-specific basis. Doing everything in-house may initially seem like the best decision when focusing only on unit costs. But starting from scratch without experienced hardware and software developers and a network of reliable suppliers can lead to time consuming redesigns, quality issues and cost overruns.

Intelligent display modules, on the other hand, are delivered ready-to-run, which eliminates any low-level programming and hardware design tasks and so can offset higher costs per unit. In the evaluation process, the individual unit costs must therefore be weighed against development costs and additional component and production costs for integrating HMIs as well as costs which arise if there are any delays, as it is crucial to be able to deliver reliably and on time in the fast paced industry of today.

It's only a Matter of Time

You've completed the project plan, calculated the costs, and decided on a way forward. However, in the field of embedded systems plans don't always go as expected. As a matter of fact there's a tongue-in-cheek saying which goes: "Take the planned development time, multiply it by two, and use the next larger unit of time." Following this logic, what started as a month quickly becomes two years. Of course, this doesn't always reflect reality, but if you consider for example that low-level development for a touch display can take half a man-year or more, changes during this period can easily double development time. This is where the crucial factor of Time-to-Market comes into play. Long development times are always hard to justify but particularly so in innovative industries.

Minimal Development Effort

Using intelligent display modules preempts delays and accelerates development. Hardware control, low-level code, drivers, and GUI functions are professionally implemented and tested before delivery so that our customers can focus their efforts on GUI design. Our intelligent display solutions offer various interfaces such as I^2C, RS232, SPI, and USB for external communication. These high-quality modules even contain their own microcontroller and various I/Os, allowing applications to be controlled by the display itself.

Innovations such as the intelligent Linux series from demmel products gmbh come with an embedded Linux operating system, enabling users to create highly performant GUI applications similar to those on tablets or smartphones, which enhances user-friendliness. Additionally, many manufacturers provide free software tools to support GUI design development, some of these are presented on page 10.

Problem Prevention

Intelligent displays also help you avoid a whole host of other issues: Procurement of components for HMI is outsourced, and potential supply chain issues are handled by the supplier. This eliminates the risk of unexpected component discontinuations or changes in display or touch ICs, which is especially important for applications with a long lifespan. Manufacturers of intelligent display modules typically offer long-term availability and take care of successor and replacement solutions. Further benefits are realized for new developments or improvements to in-house applications. Once the GUI design for an intelligent display module is programmed, transitioning to other modules by the same manufacturer is much easier. If a device, for example, requires a different display size, a significant portion of the code can be reused, instead of starting a complete redevelopment with a "bare" display.

Reduced Workforce Dependency

The shortage of skilled labor in the European job market is a prevalent issue, and the embedded systems sector is particularly affected. Thanks to reduced development effort, existing embedded developers can handle more projects sustainably, compared to using "bare" displays. This enables companies to ensure long-term scalability despite labor shortages.

In Conclusion

Display interfaces have become indispensable in modern applications. The effort required to integrate them varies significantly based on the choice of display solution. While "bare" displays may offer cost advantages per unit, intelligent display modules excel in terms of Time-to-Market and risk mitigation for long-term projects. The suitability of each solution depends heavily on the company and project specifications. Nevertheless, intelligent displays offer significant advantages for reducing effort and avoiding unexpected issues. Project managers and developers can focus on their core competencies and execute them much faster. Thus, intelligent display solutions are especially beneficial for smaller to medium-sized enterprises and custom projects. They alleviate the pressure of labor shortages and enable rapid implementation, which is crucial in constantly evolving environments. Thanks to innovative efforts in the field of intelligent displays, there are now numerous solutions tailored to specific customer requirements.

GUI Software

10.1"
1280x800

7.0"
1024x700

5.7"
640x480
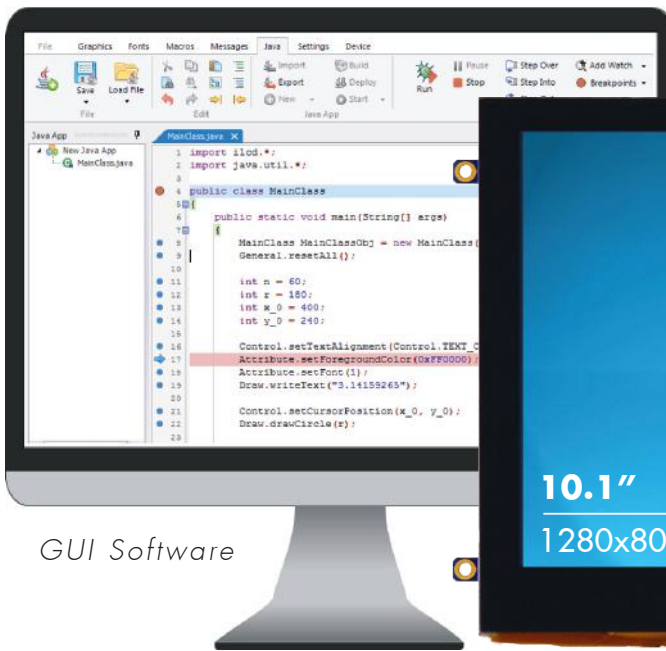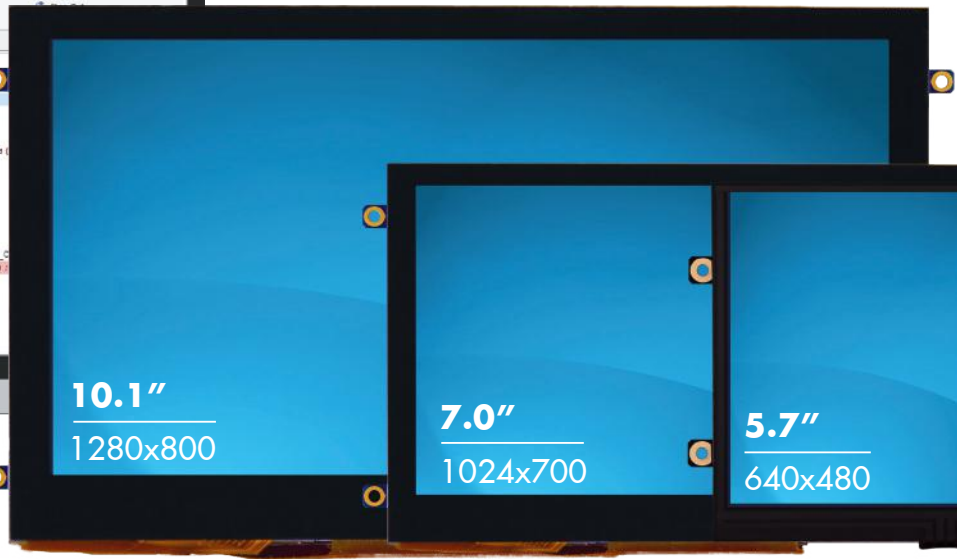
Available Sizes

The iLCD JPro F-Series

The iLCD Java Programmable (JPro) series of micro-controllers plus displays has just gotten a massive update: Enjoy higher resolutions, improved image quality and vastly faster speed of our new F-Series. The flash memory with 30 MByte for images, text strings, fonts and macros and the RAM with 32 MByte for multiple screen handling with simple commands recommends this iLCD panel to be used with any application. A MicroSD card holder is on board enabling you to further expand your memory for images and specific use. One of the new exciting features is the on-board USB-C connector, which makes for even better connectivity and user-friendliness. Also, we offer a wide variety of industrial interfaces, to ease the integration into your application even further.

In addition to the convenient high-level commands, the iLCDs canbe programmed with Java. The firmware integrates a lean Java VM which executes the compiled Java code. Java Display Computing makes it possible to program the HMI sequencing in Java, to carry out arithmetic operations and to even control the whole application with the iLCD panel. Project development is done within the iLCD Manager XE which has been extended to accommodate a complete Java development environment including editor, compiler and debugger.
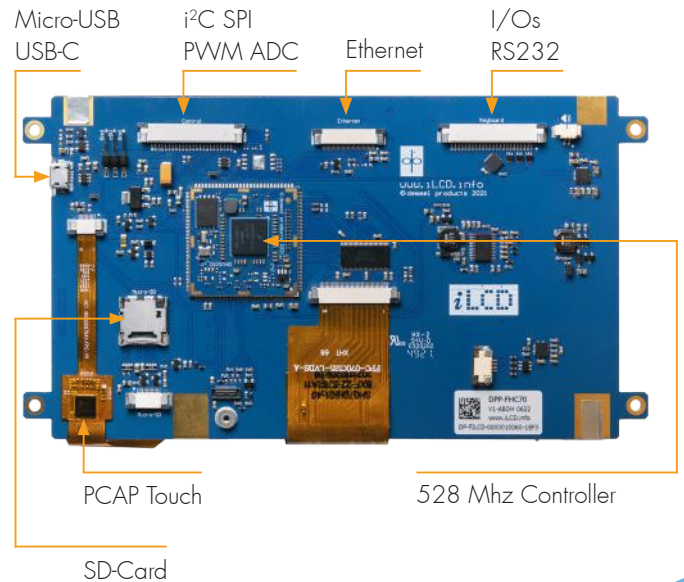

detailed specs to be found here

Classic iLCDs

PCAP Touch | Resistive Touch | No Touch

5.0"
800x480

4.3"
800x480

2.8"

3.5"

3.0"

Specification

- Fast iLCD controller with up to 528 MHz
- High resolution, IPS displays
- Superbright with 1000cd/m² for outdoor applications
- Optically-bonded PCAP touchpanel
- 30 MByte flash memory for user data
- 32 MByte RAM for screen save/restore
- Single 5 Volt (optional 3.3 Volt) power supply
- Micro-USB/USB-C port and USB via FFC connector
- RS232 port with 3.3 Volts
- I²C port and SPI port
- Controls up to 16 digital outputs
- Controls up to 16 digital inputs
- 4 analog inputs with 12-bit resolution
- Controls 2 relays or speaker/buzzer, PWM output
- Controls a keyboard matrix with up to 128 keys
- Real-time clock with battery backup
- MicroSD card holder on board and connector for external SD Card

Hardware Features

Micro-USB USB-C

i²C SPI PWM ADC

Ethernet

I/Os RS232

PCAP Touch

528 Mhz Controller

SD-Card

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*i*LCD JPro

Overview

In the age of the smartphone user interfaces (UIs) are increasingly expected to be intuitive, responsive and visually appealing. Investments in UIs have been shown to yield high returns as they are the primary way in which customers interact with the brand.

The iLCD Linux series allows you to supercharge the wow! factor of your product. With its super-fast 1.8 GHz quad-core processor (i.MX8M Plus from NXP) including integrated video and graphics processor it can play back high-quality video files and render crisp 3D-objects. The freely modifiable Yocto-Linux operating system expands the application spectrum enormously and allows you to create high performance, customized and sophisticated applications.

Our customers' success is our success, which is why we aim to set new quality standards in the field of embedded Linux displays. Our entire iLCD Linux series is equipped with high-resolution IPS displays with up to 1000 cd/m². The PCAP touch panels are optically bonded, which reduces glare, extends product lifetime, increases touch accuracy and allows for the use of up to 6mm cover glass that can be used with gloves and in wet environments.

Bonded Solution
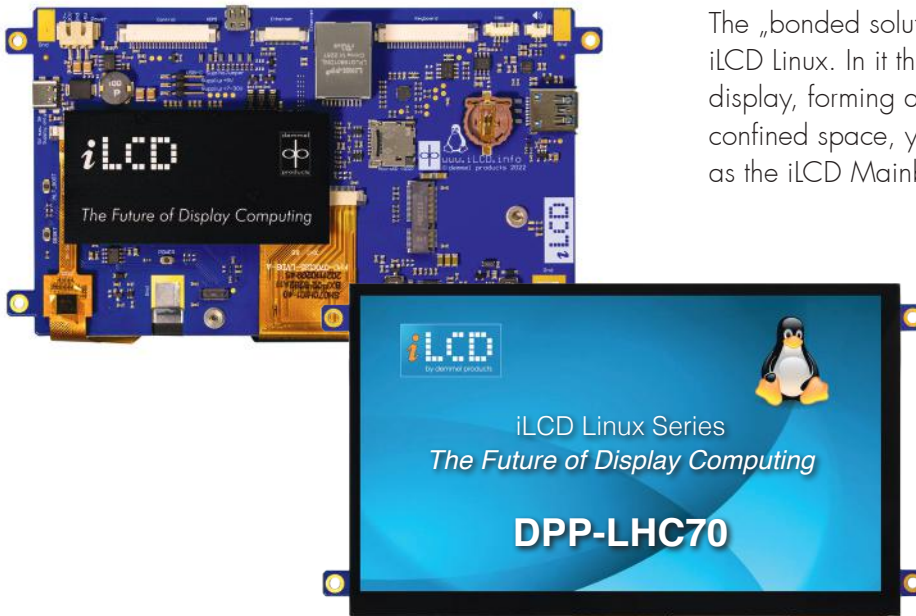
The „bonded solution" is one of two variations of iLCD Linux. In it the PCB is glued directly to the display, forming a compact unit that fits into any confined space, yet contains all the same interfaces as the iLCD Mainboard.
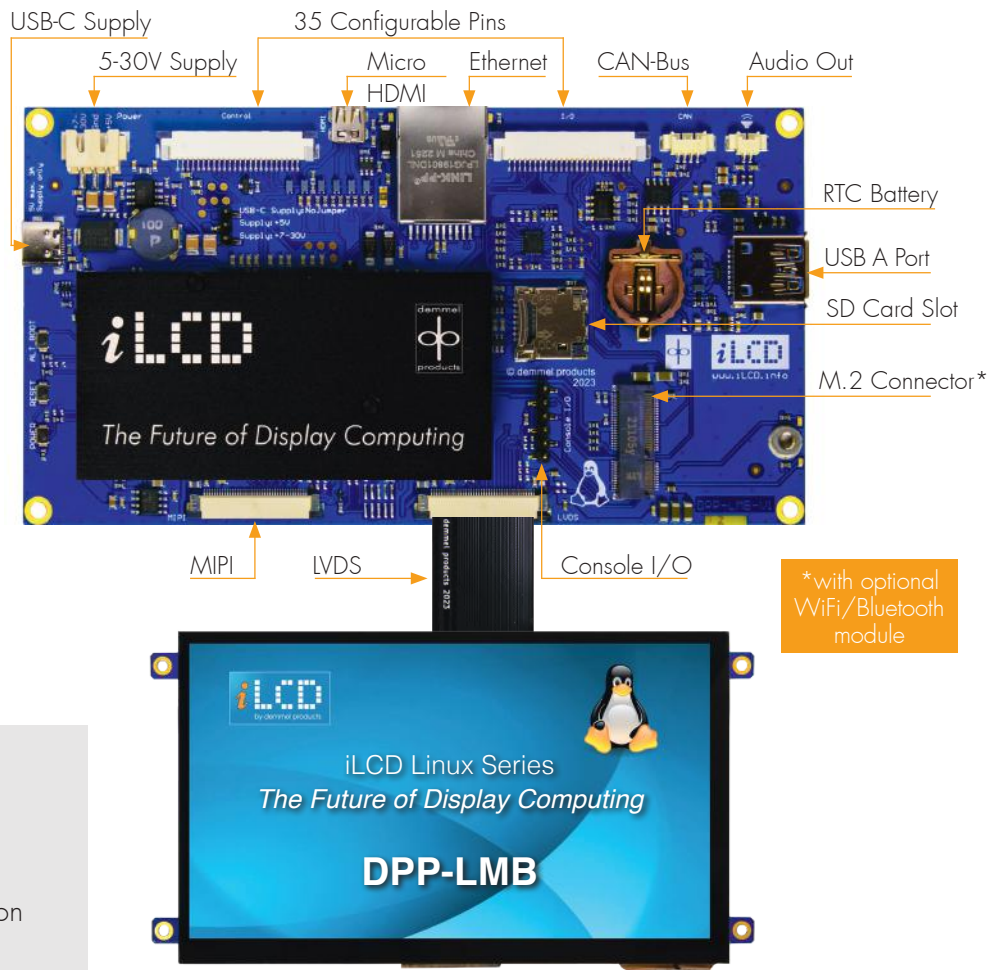
detailed specs to be found here

Mainbord

The iLCD Linux Mainboard is our most flexible solution, as it can be connected to a wide variety of displays, either via mini-HDMI or by using our LCD Pure-X series. These are displays from demmel products which can be connected in a plug-and-play fashion, with one single flex-pcb cable. Ideal for users who plan to use different display sizes or need custom solutions.

USB-C Supply
5-30V Supply
35 Configurable Pins
Micro HDMI
Ethernet
CAN-Bus
Audio Out
RTC Battery
USB A Port
SD Card Slot
M.2 Connector *
MIPI
LVDS
Console I/O

*with optional WiFi/Bluetooth module

Hardware Features:

- 1.8GHz quad-core-processor i.MX8M+ by NXP
- 16GB flash memory for application data (optionally up to 64GB)
- 2GB RAM by default (optionally 1-8 GB)
- Integrated video and 3D graphics processor
- Neural processing unit for AI applications
- Real-Time Co-Processor with 800MHz
- High resolution IPS displays
- Superbright displays with 1000cd/m²
- Passive cooling with custom heat sink

Available Options:

Bonded Solution:
- Sizes 7.0", 10.1", 12.1" and 15.6"
- PCAP Touch or no Touch

Mainboard + Display:
- Sizes 4.3" to 15.6"
- PCAP Touch, resistive Touch, no Touch
- Custom display sizes available upon request

Further, we offer custom board and display designs upon request. We develop custom specific boards with additional interfaces. Also, check out our customizations (p.14) for a variety of cover glass options.

Linux Software

Yocto Project

Our Linux iLCDs feature a freely modifiable Yocto Linux OS, which has established itself as the preferred system for embedded systems configuration in recent years. The Yocto Project allows the user to build the entire display as a Linux distribution themselves using the various methods and tools included. This enables highly specific customization of the application to meet different needs. Compared to prefabricated applications, this provides extended scope, albeit with a certain degree of complexity. However, experience has shown that users are extremely efficient once they have become familiar with Yocto.

A major advantage is the structured and uniform approach, which makes it easier to implement applications and projects that build on one another and can be applied to a wide variety of applications. Thanks to hardware independence, the control functions can also be optimally transferred and adapted to the respective device.

Of course, our iLCD Linux series supports a variety of frameworks like Qt to enhance your development. Further, other operating systems like Debian are available.

Advantages of embedded Linux

■ Embedded Linux allows developers to focus on their individual application
■ A wide variety of stacks, tools and protocols are available
■ Huge community for efficient support
■ Few limiations - making the usage of different programming languages and scripts possible
■ Projects can be implemented fast and adaptions are made efficiently

Set-Up by demmel products

All of the low-level programming is done by our team of experts. The device tree with the necessary drivers for the display, touch controller and the different interfaces and ports are implemented and tested. So, the iLCD is ready-to-run and the user can start developing the individual user interface.

If any further help is needed, either the demmel products team or our different partners are ready to support you!

more information and tips

GUI and Software Development:

The iLCD Manager XE is the IDE for setup, configuration, management, programming and test of the iLCD Java Programmable (JPro) Panels. This integrated development environment is convenient, simple to use and further accelerates LCD developments. It supports the entire iLCD JPro product line, allowing for a seamless migration and re-use of existing projects.

A complete Java development environment facilitates the development of applications running on the iLCD's Java VM. Editor, compiler and debugger are integrated and support features that are familiar from other IDEs, e.g., editing with syntax highlighting and debugging with variable inspection and breakpoints. A special feature is the remote debugging of the generated Java application, which can be carried out directly on the connected iLCD panel via the existing USB interface.

The iLCD Manager XE is completely free of charge. You can use the software even without having connected any intelligent display from demmel products yet. The integrated iLCD Simulator allows prototyping and evaluation of iLCD projects without hardware. The appearance and functionality of a graphical user interface can be tested in various development stages and by any stakeholder. Costly undesirable developments can be prevented and development sticks to project milestones.

LCD Pure

10.1"
1280x800

7.0"
1024x600

5.0"
800x480

4.3"
800x480

3.5"
320x240
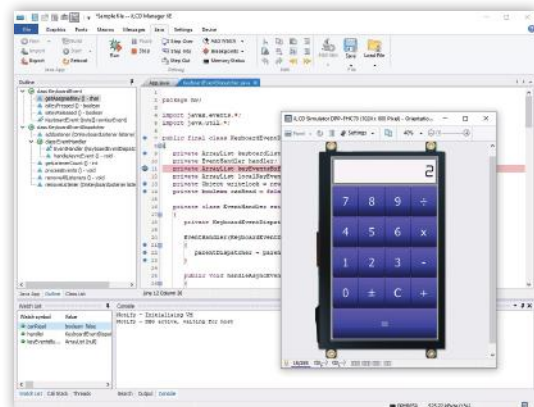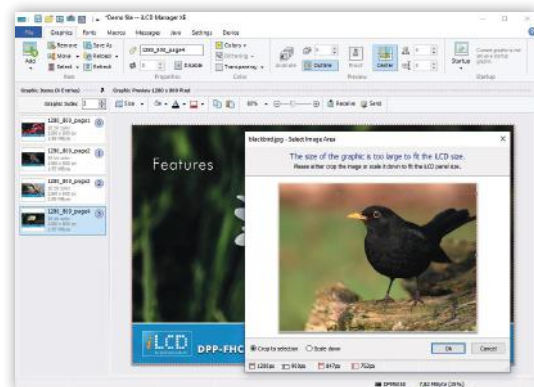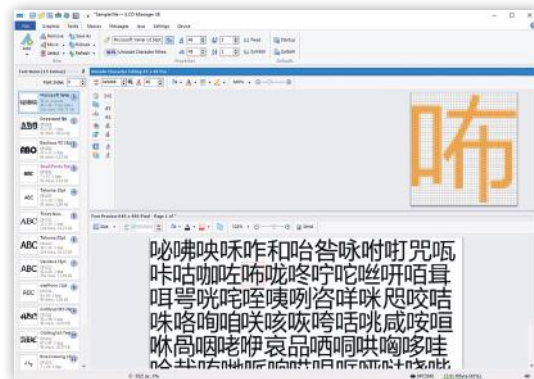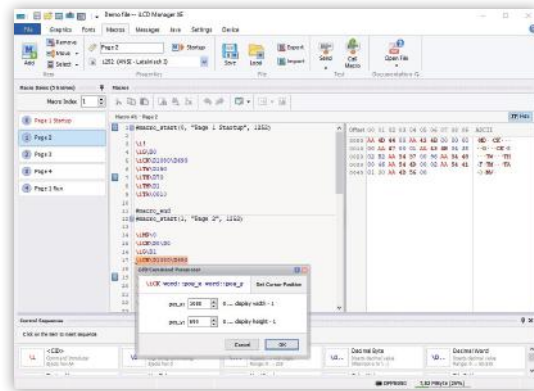
Available Sizes

LCD Pure

With LCD Pure, demmel products has launched a high-end category for pure display panels. Our goal is to provide our customers with high-end displays at competitive prices with quick delivery.

Enjoy the benefits of these excellent high resolution TFT displays. Thanks to their IPS technology they guarantee optimal readability from any viewing angle. With the LED-backlight's luminance of up to 1000cd/m², the displays are sunlight readable, making them perfect for outdoor applications. By default all our PCAP touch panels are optically bonded, which keeps the images, graphics & videos crisp and the colors vivid. At the same time, our touch controller with the optically bonded touch panel allows the use of up to 4mm cover glass.

Every LCD Pure & Pure X display comes with the following high-end qualities:

- High Brightness for readability in sunlight
- IPS displays (85/85/85/85)
- Operating Temperature -20 to +70 degree celsius

- High Resolution for displays from 4.3" to 10.1 "
- Optically bonded touch panel (for PCAP only)
- Standard delivery times are only 8-10 weeks.

LCD Pure X

With demmel products' LCD Pure X series, you will no longer have to worry about development effort to set up your display connection. Our expansion boards offer an easy way to integrate our high-end displays into any LVDS capable platform. They were designed to seemlessly communicate with our iLCD Linuxx Mainboard, but can be used in wide variety of systems. The PCB of our LCD Pure X series comes with all the necessary components for the display control. The connection to your control board is made with a single, specially designed 40-pin flex pcb cable that covers the communcation with the display and the touchpanel and even the power supply.

Custom Solutions

All our displays can be customized, allowing you to stand out even more.Starting at 500 pieces we offer multiple configuration options which are illustrated on this page. Save time and effort dealing with numerous suppliers and satisfy all your display needs in one place. Pricing and delivery times are highly competitive with average times from order to arrival ranging between 8 and 11 weeks.

Let these options inspire you to even bolder and more attractive designs for a more high-end appearance of your device.
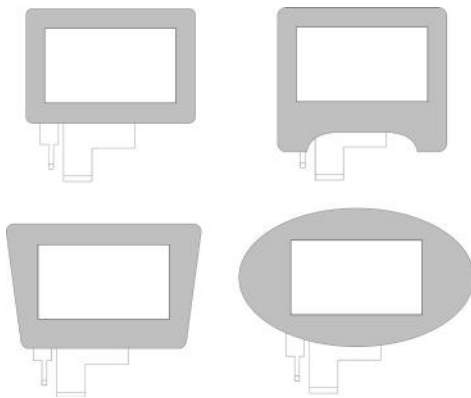
Custom Shapes
The shape of the cover glass can be cut to almost any shape

Custom Thickness
The thickness of the cover glass can range from 0.55 to 4mm

Custom Cut-Outs
The foil on the back of the cover glass can be cut to shape

Adhesive Tape
Various different chemistries available incl. waterproof solutions
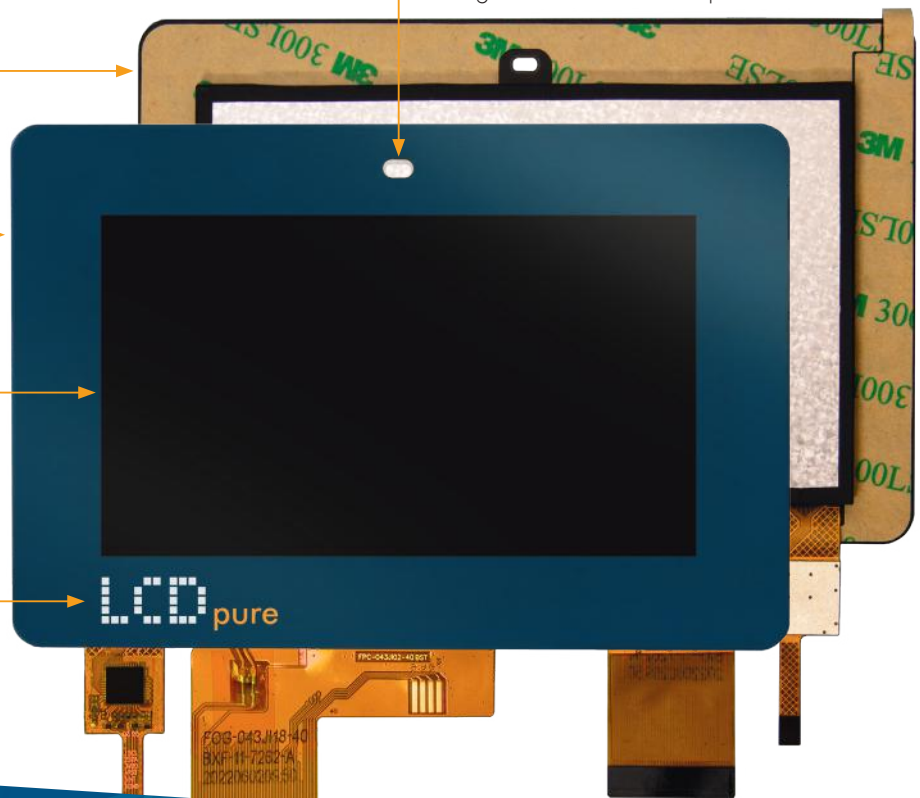
Custom Color
Redefine the background color of the cover glass

Capacitive Touch
Optically bonded capacitive touch panels are highly sensitive yet durable

Print
Have your logo and graphics printed to the back of the cover glass

Development Kits

Interested in trying out our products?
Then order your development kit right away!

iLCD Development Kits by demmel products:

Our development kits for iLCD Linux and iLCD Jpro provide the ideal starting point for your projects.

They include everything you need to start developing such as your preferred display model, connectors, cables and other accessories that help you kick-start your development efforts.
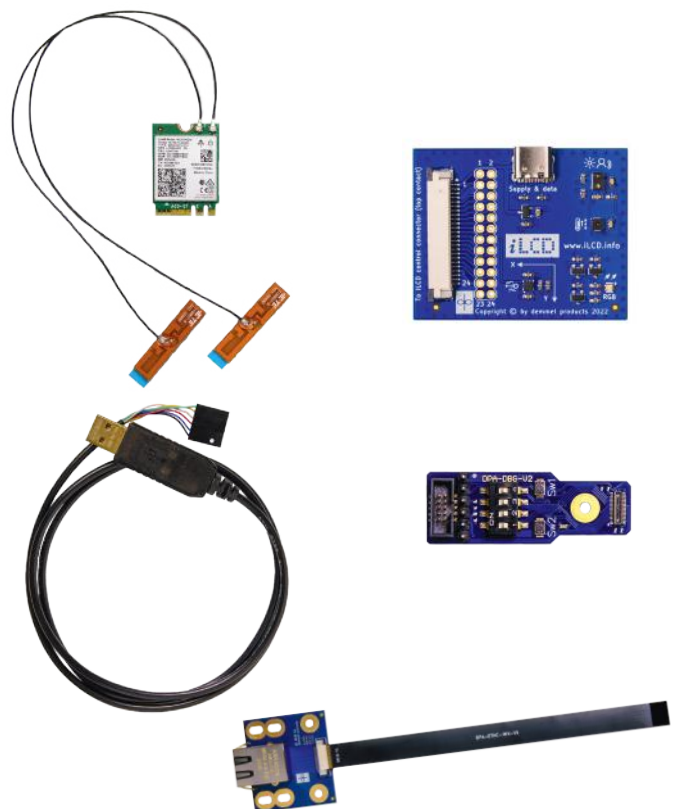
Accessories

demmel products offers a wide variety of helpful accessories, which make it even easier to develop your projects.
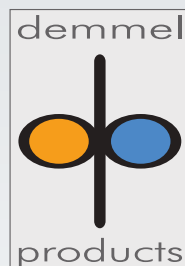
These include:

- Starter boards with sensors and demos
- Ethernet boards
- USB-Interface boards
- Wifi & Bluetooth modules

and many more…

Getting started

INTELLIG
ENT PROD
UCTS FOR
SMART SO
LUTIONS

demmel products GmbH
An der Hoelle 31
1100 Vienna, Austria

office@demmel.com
T: +43 1 689 47 00 - 0
www.ilcd.info