









Parker Pro Display 10 Display Modules

Electronic Control Systems







Technical Information

Application

Parker Pro Display 10 is an apps-based HMI (Human Machine Interface) product for mobile machines and vehicles. Pro Display 10 provides the possibility of having one centralised HMI display in the vehicle cabin for machine functionality, diagnostics, efficiency tools, infotainment and entertainment, and much more. Customer can incorporate an unlimited number of apps into one display product, and the display is not limited to one particular control system integration.

Pro Display 10 comes with a 10.1" touchscreen display and is intended for in-cab use.

Properties

Parker Pro Display 10 has a high-level display for demanding HMI needs. The processor, together with software toolkit, enables great graphical performance. High-speed RAM memory greatly improves the performance. The reliability is improved by SLC technology of Flash memory, including internal wear levelling and bad block management.

The use of IPS technology display offers clear images with great colour reproduction from all viewing angles, allowing the display to be mounted in landscape or portrait orientation. A touchscreen interface enables an intuitive, rapid and accurate interaction with the display's applications, however the platform can also be controlled using remote buttons or a pulse wheel.

Pro Display 10 offers a wide variety of communication interfaces. CAN bus supports communication up to 1 Mbps and enables simpler installation with software-controlled termination. Software updates can be made easily by using a memory stick via a USB port. There are internal antennae for wireless communication, and a connector for an external antenna for the FM-RDS radio. Pro Display 10 is capable of reproducing sound and showing videos with audio. Bluetooth can be used for remote display and diagnostics, mobile phone hands-free apps, as well as for music streaming services.

Besides two available camera interfaces, a number of IP-cameras can be connected via Ethernet switch or WLAN access point. Two mounting methods are available for Pro Display 10. The display can be easily integrated into the panel using a steel bracket or can be mounted with adjustable RAM® Mount components.

Pro Display 10 offers different modes for fast system start up, such as sleep mode, shutdown mode and operation mode.

Specifications

General

Weight 1.42 kg
Operating temperature -30°C - +70°C
Storage temperature -40°C - +85°C

Protection IP65

Voltage supply 12V and 24V (6 - 36 Vdc)
Camera supply 12 Vdc
CE marking 2014/30/EU
E-Mark E17 10-R-040108

Performance

Processor (Prime) Freescale i.MX6solo (800 MHz)
Processor (Advanced) Freescale i.MX6dual (800 MHz)

RAM size 512 MB / 1 GB

Flash size 2 GB

External memory Micro SD card Software tools Parker UX Toolkit

Communication interface

CAN 4
USB 2 (2.0 high speed host)
RS232 1 (TX, RX, GND)
Ethernet 1 (10 / 100 Mbps)
Wireless Bluetooth¹

WLAN, 802.11 b/g/n

Infotainment

Audio Line IN/OUT,
Microphone IN,

FM-RDS radio tuner
Video inputs 2 x analog composite

Display

Touch interface PCAP

Display 10.1" IPS LCD, 16:10²
Resolution 1280x800 pixels
Brightness 400 cd/m2 (typical)

Backlight White LED

Connection

Electrical connection 2 x Deutsch DTM04 12-pin Ethernet 1 x M12 4/5-pin USB 2 x M12 4/5-pin

Video input 1 x M12 5/6-pin

Radio antenna 1 x SMA for FM-RDS radio

Inputs/Outputs

Supply outputs

Digital inputs 1 x keylock,

1 x wakeup 1 x +12V / 1A³

Digital outputs 1 x highside 200 mA⁴

Internal features

3-axis acceleration sensor

Voltage measurement / supply supervision Real time clock with backup

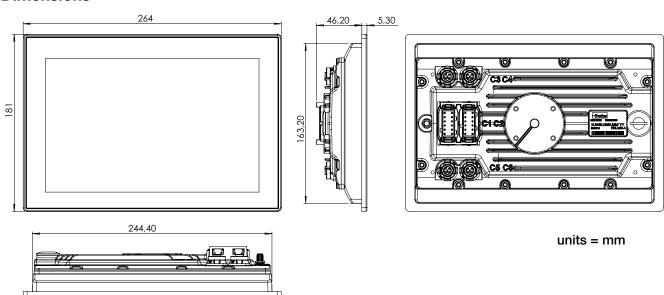
- 1) Hands-free, serial port protocol, A2DP sink
- 2) Hardened glass with anti-glare coating
- 3) E.g. for camera supply
- 4) E.g. for audio amplifier wakeup



Comparison of Product Variants

Available Product Variants:	Prime	Advanced
Processor	i.MX6solo	iMX6dual
RAM Memory	512 MB	1 GB
Bluetooth	-	yes
WLAN, 802.11	-	yes
Audio	-	yes
Radio Antenna	-	yes

Dimensions



Ordering Part Numbers

Parker Pro Display, serial production

Pro Display 10 Prime 88PROD10PS10
Pro Display 10 Advanced 88PROD10AS10

Parker Pro Display, development

Pro Display 10 Development 88PROD10AD10

Accessories

1" RAM mounting kit, Pro Display 10 Panel mounting kit with bracket, Pro Display 10 M12 USB cable, Pro Display Ethernet cable 1,5 meters

Main connector harness package, Pro Display Development - C1 Main connector harness package, Pro Display Development - C2

Main connector harness package, Pro Display Development - Connectors only

65RAM1KIT 88PMK2PROD10 88CABPRODUSB 20077780 (IQAN accessory) 5030125 (IQAN accessory) 5030126 (IQAN accessory) 20073081 (IQAN accessory)



Develop Unique HMI with Parker UX Toolkit

Parker UX Toolkit includes the software tools to develop applications for Pro Display 10 according to customer's own needs. Apps-based platform enables separation of system functionality into own apps and independent app development, as well as integration of 3rd party software.

Parker UX Toolkit provides the tools to simplify application development by integrating all essential functions in order to optimise the development flow. All included app examples and ready-made UI components can be utilised and modified freely.

Parker Application Designer

Parker Application Designer is the perfect tool for creating professional and user-friendly apps for Parker Pro Display. Advanced scripting language (QML) and the WYSIWYG editor with ready-made components and style guide are the key elements for the quick and easy programming of apps.

The WYSIWYG editor (what-you-see-is-what-you-get) offers a simple and fast way of implementing your application. Application Designer enables the ease design of a custom graphical user interface, or the user can simply drag and drop the ready-made components. The components can be modified to fully reflect your own look and feel. The visualised content of an application can be evaluated instantly.

For OEMs, Parker UX Toolkit provides a feature called "System project", which standardises common system-specific data and rules to be used in the development of apps. The system project is a special project in Application Designer and can be imported into each app project. With system project, the app developer can rapidly begin building value-added functions instead of wasting time having to redefine the infrastructure of each app.

The platform supports multilingual applications which can change fonts and text for each language. Whenever the current user language is changed, all dependencies are evaluated and displayed automatically.

Data Management

Intelligent data management includes ready-made device and protocol suites, as well as efficient inbuilt diagnostics and alarm features to define communication interfaces very quickly. Reliable communication between machine and app can be created easily using drag-and-drop protocol layers.

Parker provides Device Suite, which implements an interface into many hardware devices, and J1939 Suite for standard communication with CAN bus. Our Communication Suite includes generic protocols for extracting, generating and manipulating data. With this special 'block library', you can define and manage different communication interfaces in your machine, such as CAN, Ethernet, Bluetooth and USB. System functionality can be expanded by creating new devices and protocols to manipulate the real world data.

Parker's data management includes efficient inbuilt diagnostics and alarm features for the data signals. Each signal path provides information about its health, which can be utilized with UI components.

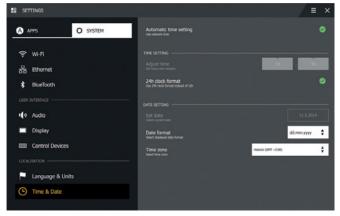
App Examples★

Parker Pro Display 10 comes with several app examples, demonstrating on how the hardware features can be programmed with Parker UX Toolkit. Parker example apps can be utilised and modified freely, to deploy customised applications according to customer's own needs.

Available example apps are for example:

- Menu App / Menu System
- Settings App
- Maintenance App
- Dashboard
- Media Player App / Radio App

Parker is also offering commercial apps for different mobile machine industry needs.



Parker Settings App



Features will be implemented in upcoming releases.



Technical Information

Environmental Protection

ESD

ISO 10605 (Electrostatic discharge operation & handling)

ΙP

IEC 60529 (Ingress protection IP65)

Athmosphere, corrosion

EN 60068-2-52 Test Kb (Salt mist) ISO 15003 (Chemical brush exposure) EN 60068-2-5 (Solar radiation)

Electrical

ISO 16750-2 (Operation voltage, overvoltage, superimposed alternating voltage, reversed voltage, slow decrease and increase of supply voltage, momentary drop on supply voltage, reset behavior at voltage drop, line interruption, short circuit protection)

Parker (Power supply with and without battery, immunity to micro power cuts)

Mechanical environment

IEC 60068-2-6 (Sinusoidal vibration)
IEC 60068-2-64 Test Fh (Random vibration)
IEC 60068-2-27 (Mechanical shock)
EN 60068-2-29 (Bump)
IEC 60068-2-6 (Resonance search)
Parker (Impact)
ISO 16750-3, 4.3 / IEC 60068-2-32 (Free fall)

Climate environment ISO 16750-4

IEC 60068-2-14 test Na (Temperature shock)

IEC 60068-2-2 (High temperature, storage)

IEC 60068-2-1 (Low temperature, storage)

IEC 60068-2-78 (Damp heat)

IEC 60068-2-30 (Damp heat cyclic)

IEC 60068-2-14 test Nb (Temperature cycling)

IEC 60068-2-2 test B (High temperature, operational)

IEC 60068-2-1 (Low temperature, operational)

EMI

ISO 7637-2 (Conducted transient emission, pulses 1, 2 & 3)

CISPR 25 ed3.0 (Radiated RF emission)

ISO 11452-1, ISO 11452-2 (Radiated RF susceptibility) ISO 11452-8 (Immunity to low-frequency magnetic fields) CISPR 25 ed3.0 (Conducted RF emission)

ISO 11452-1, ISO 11452-4 (Conducted susceptibility)

ISO 7637-2 (Transient - inductive load switching, inductance, coupling, cranking, load dump) ISO 7637-3 (Transient, signal lines, fast)

Miscellanous

EP 455 (Readability)



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US Product Information Centre Toll-free number: 1-800-27 27 537

www.parker.com



Parker UX Toolkit Software Tools

Electronic Control Systems



Create an Efficient and Unique Interface for Your Machine

Increase productivity of your machine by having a centralised control unit that is amazingly user-friendly. Parker offers the tools to create a premium human machine interface (HMI) for your machine.

It is an agricultural, bus, construction or forestry solution; you can combine all essential applications into one easy-to-use HMI display. Include all the functions your customers may want; the number of apps is unlimited. It's completely your design.



Provide your customer with an opportunity for intuitive communication with your machine, to improve efficiency and work safely.

Core Functionality

To operate the machine, create functionality apps for instrumentation, controls and adjustments, such as dashboard, ISOBUS and harvester head control.

Efficiency

Design applications such as auto-steering, auto-levelling, weighing management, fleet management, augmented camera views, bus route manager, maps and navigation



Parker UX Platform

Move Your Business into Apps

Parker UX Platform (UXP) is an apps-based platform that can be used to develop human machine interface (HMI) products for mobile machines and vehicles. The platform is designed to enable separation of system functionality into separate apps. The list of advantages for using separate apps is impressive; quick independent development, flexible installation, individual value-added interface into your machine and many more. It gives you the possibility of integrating your own designers', partners' and third-party capabilities into one product.

Build Your Own User Experience

This is a platform for innovation. It is full of possibilities, implementing both your essential functions and the most amazing ideas. Parker UX Platform provides an incredible PC toolchain to create your own unique HMI product, which responds particularly to your customers' needs and supports your brand success. With Parker high quality displays, we will give you a possibility to offer a great experience in the machine.



Reduce downtime when performing the core job by creating diagnostics, prognostics, integrated documentation, geofencing, immobiliser and load moment indicator apps.

Entertainment/Infotainment

Bring all entertainment and infotainment systems into one display, such as the mobile phone app, media player, radio and bus sign management.

Personal Tools

Provide tools like a journal, calculator and calendar to help the operator increase their productivity.



Develop





















Experience



PLUGINS

SETUP

DESIGN

SIMULATE

ANALYSE & PROFILE

PACKAGE

CERTIFY

Distribute

INSTALL & UPDATE

Parker UX Toolkit for Application Life **Cycle Management**

The Parker UX Toolkit allows designers and developers to focus on delivering successful solutions. We provide all the building blocks to deploy the apps easily, with a short time-to-market and comprehensive life cycle management. All Parker app examples and ready-made components can be utilised and modified freely.

Design Customised Plugins*



Parker Plugin Wizard together with Qt Creator tool allows you to extend the functionality of the Parker UX Platform, to develop more complex applications.

With these software you can develop protocol layers to extend communication capabilities, advanced QML components with C++ and separate platform

processes for heavy calculations. Plugins are packaged and imported into a part of Parker Application Designer's application projects.

Define the Control System and Application Frames



System Project

System project is a special project type that can be developed and packaged with Parker Application Designer. This project is a control system setup and can be imported as part of all your actual application projects. System project includes information, boundaries and rules for the apps on how to operate.

System project provides a way to define the following:

- Machine communication
- Select display product
- Component style guide and themes
- Application life-cycle animations
- Mandatory languages to be translated
- System security
- User groups



System-specific data only needs to be defined once for all your display apps. The app developer can rapidly start to build valueadded functions instead of wasting time with re-defining the infrastructure.

UXP Style Guide & Themes

Parker offers a style guide with a professional default theme, which can be utilised and modified freely to suit your brand and needs. A consistent layout of applications improves userfriendliness and work efficiency substantially. Create your own look and feel - components and apps will have the same identified outfit.

By using the style guide and definition tools you can create a frame for all applications in your machine.

App Design



Parker Application Designer is an innovative programming environment, which facilitates the development of great user interfaces with minimal programming effort. The software is based on QML language which is designed to describe the user interface of a program, and doesn't require specific programming skills.

What You See Is What You Get WYSIWYG editor offers a simple and fast way of implementing your application without having to write code. This visual editor

Intelligent Data Management

Create amazingly fast, reliable

enables you to easily design a custom graphical user interface, or simply drag and drop our ready-made components. The visualised content of application can be evaluated instantly.

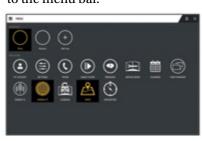
Ready-Made Components Parker provides a wide variety of modifiable UI components to ease the developer's work. The library includes elements such as buttons, switches, scroll bars, sliders, bar diagram, tabs, tumbler, dialogue box, drop-down menu, video overlay, keyboard, icon, telltale, gauge and more.

Language Translation

UXP supports multilingual applications which can change fonts and text for each language. Whenever the current user language is changed, all dependencies are evaluated and displayed automatically.

Accessible Menu System *

Parker Menu App example offers a clear menu structure. Parker Menu System example includes a menu bar with a drop-down options menu. Each app project can utilise the menu system to standardise usability of apps. Each application can register essential extra menus and icons to the menu bar.



by using drag and drop protocol layers. Parker provides Device Suite, as CAN, Ethernet, Bluetooth which implements an interface and USB. System functionality into many hardware devices, can be expanded by creating and J1939 Suite for standard new devices and protocols to

communication between machine and app

manipulating data. With this special 'block library', you can define and manage different communication interfaces in your machine, such

communication with CAN bus.

Our Communication Suite

includes generic protocols

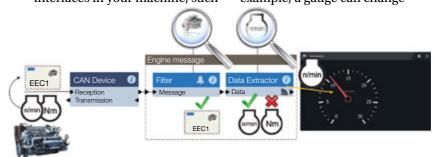
for extracting, generating and

Parker's data management includes efficient in-built diagnostics and alarm features for the data signals. Each signal path provides information about its health, which can be utilised with UI components. For example, a gauge can change

manipulate the real world data

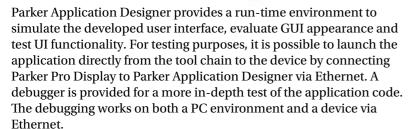
its pointer colour or blink the pointer if the corresponding data signal health has some problems. An alarm can be created for each signal path health issue and submitted to other apps, it can be displayed on top of the menu bar or logged in the notifications app for later diagnosis purposes.

Example: Engine controller broadcasts EEC1 message containing engine RPM and torque values. Display receives the message and extracts engine speed from the message data. Gauge subscribes the engine speed data.





Test and Simulate * 🔾 🛠



Parker Application Designer provides the key elements to develop a comprehensive simulation environment for the application. All data management interfaces can be simulated and monitored during the test process on PC or directly on the device via Ethernet.

Distribute 📸 🧟







Parker Application Designer packages the application content (files) into Debian packages, including necessary dependencies to the system. The Parker System Certifier tool's key purpose is to certify and encrypt software packages to prevent unauthorised software installations. Encrypted packages can be safely transferred over a public network. System Certifier is intended only for OEM's use. Certified packages can be installed into Parker display products with the Parker Maintenance App. With this app, customers can install new, update existing and remove unnecessary apps, as well as see the current software versions.

Operate*



Parker offers flexible and intelligent features to view the machine data, and works efficiently and intuitively through a one touchscreen display. Operators can run parallel applications, swipe to switch between running applications, change display orientation runtime, split the screen and - according to machine functions or other connected devices - always see the correct application on display.





View Manager

The operator can link different machine and application functions within defined activation signals in Parker View Manager App. For example, when driving the machine in reverse, the display can automatically show a special dashboard with a reverse camera view. This flexible feature enables further intuitive and efficient user interface.

With Parker UX Toolkit you can produce great looking HMIs displayed with rugged and highperformance Parker products.

Analyse and $\sqrt{}$ **Profile***

Parker Application Designer contains the code analysing tools to identify potential bottlenecks in code performance. Developers can inspect binding evaluations, and signal handling and painting operations when running a QML code. Parker UX Platform and Application Designer also provides building blocks for data logging and data analysis.

User Management 2



Parker User Account App offers the possibility of managing different users and user accounts. In each application project the developer can define application specific user permissions. Permissions can be utilised to restrict or allow certain functions and control visible applications for user levels. Developers can also define whether the saved data is system or user-specific information. User-specific data such as dashboards, display brightness and machine settings are automatically updated at the moment of login.





Settings >

Parker Settings App provides centralised interface for all app specific and system settings. Besides the app specific settings, the user can define the settings for the display and possible control devices, communication, audio and hardware, as well as localisation settings such as time and language.

User Configurable Dashboard*

Parker's flexible features to view the machine data helps working efficiently and intuitively through one display.

Operator can create individual dashboards according to their personal needs and save them. To add a new dashboard into your display menu, just select the desired widgets from widget library, organise and resize them freely and then approve.

You can easily create an operation related dashboard for your different work functions and your own favourite views. The displays menu can consist of several personal dashboards. User-specific dashboards are updated when the operator logs

Diagnose[★] Yo



Parker Notifications App presents the data from each application log in a one clearly outlined table. This example application collects all the information messages, warning notifications and critical alarms together with sort and filter functions.

With Parker UX Platform it is possible to develop powerful diagnostic applications. A diagnostic application can inspect signals from the data management and visualise data in many formats. The measure groups, which can be configured runtime, can be logged for further analysis in the tool chain.





Choose widgets for your personal dashboard.



Organise and resize widgets on the screen easily with touchscreen.



Your personal dashboard is ready and saved

Ordering Part Numbers

Parker UX Toolkit Ordering P/N **Application Designer** 88PAD1 **Parker Pro Display** Ordering P/N 88PROD10AD10 Pro Display 10 Development¹ Ordering P/N **Accessories** 88CABPRODUSB M12-USB cable² Serial products & other accessories: Part numbers are found from catalogue HY33-4020/UK

- 1) Intended only for product development use
- 2) Needed for software installation via USB flash drive



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