HILTOP

POWERED BY DEVTANK

A comprehensive test system under your control – Say goodbye to vendor lock-in and embrace the future of automation

Hardware-In-the-Loop-Test-Operating-Platform

The HILTOP, developed by Devtank, is a modular open-source platform providing users with a robust base to build their test and measurement solutions. Use ProdTOP or LabTOP open-source software to quickly create your production test or laboratory applications. We supply a range of hardware options and base software libraries to get you started. The HILTOP is built on a stable Linux software platform and comprehensive design expertise.

Typical Applications:

- Automated Test and Measurement (ATE)
- Remote monitoring
- Hardware in the loop testing
- Measurement automation
- Production process monitoring
- Production functional testing
- Industrial control

Powered by Raspberry Pi

- CPU-1.5GHz Broadcom Quad Core ARM Cortex (Raspberry Pi CM4)
- FPGA- Expansion slot on Backplane
- Integrated SATA support and 1TB hard-drive
- Gigabit Ethernet port
- Integrated programmable 30V/2A Power supply
- 7" high contrast colour touchscreen
- 3 x USB2.0 ports and 1 x USB 3.0 Port
- GPIO Expansion slots for additional hardware
- USB Barcode scanner and camera support
- High-Speed Open VTI Backplane standard
- Standard Eurocard-ready 6HP expansion ports
- Isolated RS485/RS422 & RS232 interfaces
- Isolated CAN FD interfaces
- 4K HDMI Port
- Ports - 1x PC Fan - 1x mPCIe - 1x One-Wire
- CSI (MIPI Serial Camera) - 1x DSI (MIPI Serial Display)
- Onboard Hardware - Temperature Sensor, RTC, and EEPROM
- Auto Script generation from DOORS® or Spreadsheet test specifications
- Dual control software platform accessed either from the shop floor or remote web interface
- Data Logging Capability with SQL database integration
- Hardware Watchdog enable

Supports

- MIKROE
- Stemma QT Header 3 on 2mm A/D/PWM
- Stemma QT Header 4 pin 2mm I2C
- Stemma QT/Qwiic Header 4 pin 1mm I2C
- Raspberry Pi 40 Way Header
- mPCIe

All hardware designs, schematics, gerber data, enclosure information and base software are available to you as a customer.

open source™ open source hardware

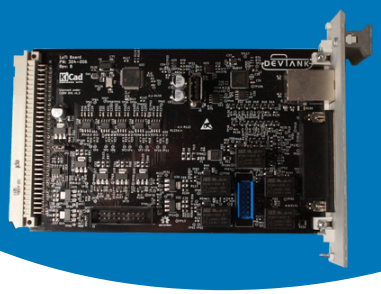
Specification

Integral motherboard/controller adopting a flexible split architecture with **64bit ARM processor** and parallel **FPGA hardware acceleration.** Powerful 1.5GHz quad-core ARM Cortex CPU (Raspberry Pi CM4) fitted as standard.

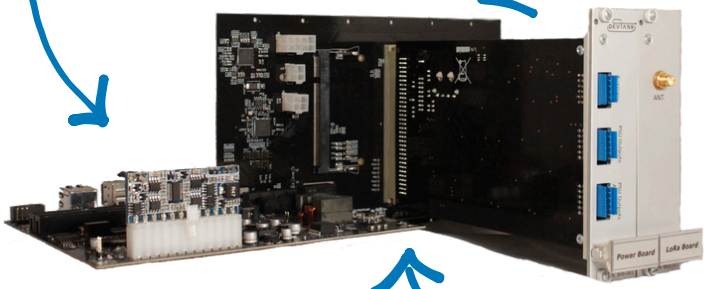
Both ARM CPU and FPGA core use a modular system-on-module form factor which are fully upgradable in service.

Fully integrated backplane with interconnection to the motherboard and FPGA using the Open-VTI bus standard*

Eurocard plug in examples:
Multi-channel High Performance ADC Card
Software Controlled Load Board
Switch Array (Fault injection and Signal routing)
Software Defined Radio Transceiver



7" Touchscreen
800 x 480 px
10 finger capacitive touch
High contrast



Open-VTI - Backplane
(3 or 6 card slot options)
USB2.0, LVDS, GPIO, Power

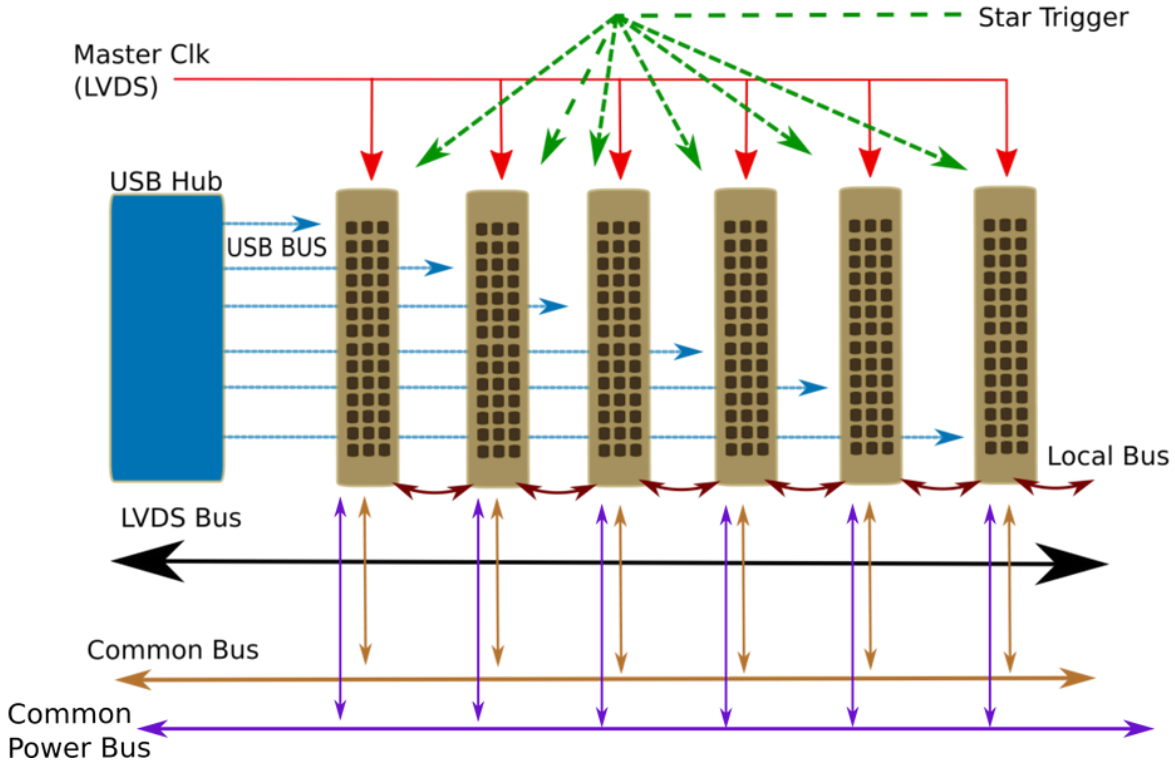
2 x 40 way Expansion Ports
(Rasp Pi compatible)
GPIO, Data & Power

RS485	**CAN**	**RS232**	**Gigabit Ethernet**	**Internal USB 3.0**	**3-30V 2A Programmable PSU**	**HDMI**	**SATA Hardrive (1TB)**	**Front & Rear USB 2.0 Ports**

- Industrial grade 3U (63HP or 84HP wide) Instrumentation Case
- Raspberry Pi CM4 Broadcom BCM2711 quad-core Cortex-A72 (ARM v8) 64-bit SoC @ 1.5GHz (all variants)
- 1x 4mm Rear Panel power socket outputs for programmable DC power supply
- 1GB LPDDR4-3200 SDRAM with ECC, Real-Time-Clock and Onboard Temperature Monitoring
- Lattice ICE40HX8K FPGA SO-DIMM
- On-board EEPROM Memory for Constants and Calibration Data
- 3 (or 6) off 3U Eurocard slots for custom plug-ins with connection to the backplane via DIN41612 connectors
- 1 x GPIO Expansion Header Ports (direct exposure to CPU and FPGA I/O)
- 1 x Galvanically isolated 10Mbit RS485/422 channels
- 1 x Galvanically isolated 8Mbit CAN FD channels
- 1x Isolated RS232 Full Duplex
- 4 x On-board ADC's
- 1 x Gigabit Ethernet port
- 2 x I2C, 2 x SPI, UART
- Replaceable SD Card (Hosts OS Image)
- SATA up to 5Gbps (via USB3.0) and 1TB 2.5" hard drive installed (standard build)
- HDMI 4K Port
- Integrated software programmable DC Power supply (30V/2A) with voltage and current monitoring (4mm front panel sockets and backplane exposure)
- 4 x USB ports (1 front, 2 rear, 1 USB 3.0)
- 7in Front panel capacitive touchscreen (800 x 480px)
- Customisable front and rear panels to suit customer application or connector interface
- Operating temperature range : 0°C to 50°C
- PSU Input voltage 250W 110-240V AC 50-60Hz (standard build) OR 80W 12V DC supply option for portable operation.

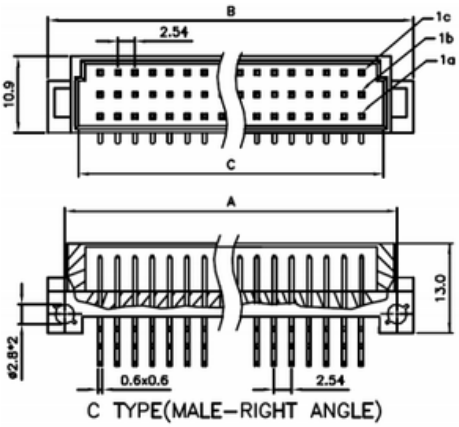
Open-VTI Backplane

Developer friendly open backplane standard, supporting power, data and cooling for DIN41612 Eurocard instrumentation modules. Designed for both basic and advanced applications with a lower barrier to entry than PCI/PXI bus



- **Star Trigger** – Matched length master trigger line for accurate synchronisation of cards. Can be driven from the master CPU or FPGA.
- **Master Clock** – Matched length LVDS signal driven from master FPGA. Cards can use this as a reference clock to synchronise their internal clocks using a Phase lock loop.
- **USB Bus** to each card from the motherboard CPU (via HUB chip). Max data rate of 480Mbps (USB2.0)
- **LVDS Bus** from master FPGA to each card. (Max data rate TBC – est. 100Mbps)
- **Local Bus** – Each card has uncommitted IO for communication with its neighbour. (Allows multi-card solutions to be realised)
- **Common Bus** – Each card is connected to a mixture of common CPU and FPGA IO Signals. This includes a mixture of digital TTL GPIO and comms buses including SPI, I2C and PWM.
- **Power** – Each card has support from multiple power rails protected by resettable fuses and provided by the motherboard/chassis combination. +12V, +/-5V, +3.3V & Adjustable DC (3-30v) supplies available

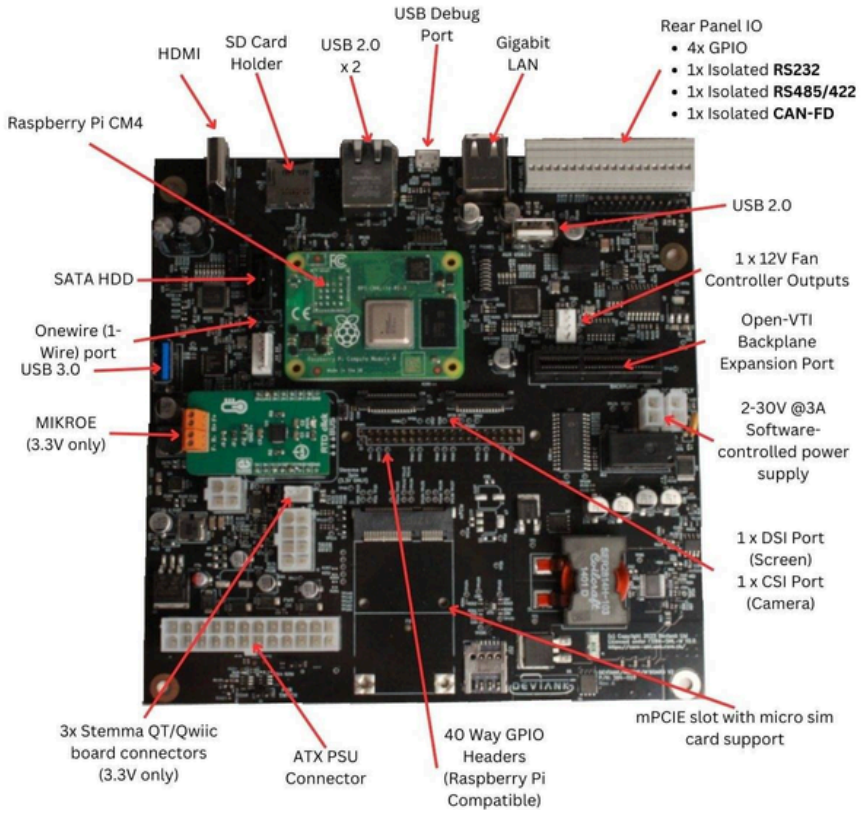
DIN41612 Eurocard Connector – Type C (96)



Backplane I/O Per Port	Qty
LVDS High Speed Data Lines	2
LVDS Master Clock	1
USB2.0 480Mbps	1
I2C Bus	2
SPI Bus	2
PWM	2
System Clock & Trigger	1
Shutdown, Reset & Port Select	1
FPGA GPIO	10
Processor GPIO	10
Local Bus	16
Power: +12V, 5V, -5V, 3.3V & Programmable DC (3-30V)	5

Standard Connectivity

The HILTOP offers a comprehensive range of built in I/O hardware functions to enable a range of test and measurement solutions straight out of the box.



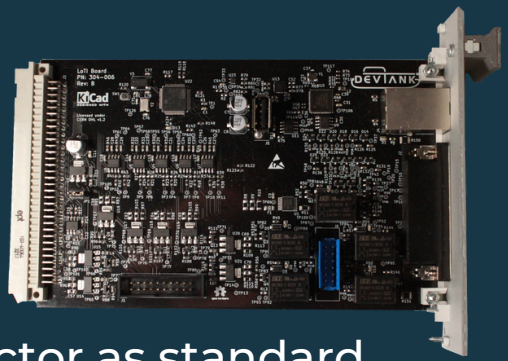
PIN 1	+3V3 ISO
PIN 2	+5V ISO
PIN 3	GND ISO
PIN 4	GND ISO
PIN 5	RS232 CTS
PIN 6	RS232 RTS
PIN 7	RS232 RX
PIN 8	RS232 TX
PIN 9	RS485 B
PIN 10	RS485 A
PIN 11	CAN L
PIN 12	CAN H
PIN 13	IO4
PIN 14	IO3
PIN 15	IO2
PIN 16	IO1
PIN 17	GND
PIN 18	GND
PIN 19	+5V
PIN 20	+3V3

Rear Panel I/O

Eurocard Options

- LoTI Board – Lots of Test Interfaces including ADCs, GPIO, High Side & Relays
- MoTo Board – Dual Brushed 2A DC Motor Controller
- Power Board – 6 x Programmable 250mA +/-5V DC Supplies
- Voltage Board – Programmable AC (10-110V) 50/60hz Voltage Sources
- Current Board – Programmable AC/DC Current Sources (1mA to 5A)
- Sensi Board – 4-20mA, RTD, Thermocouple, Analogue and more!
- Analog Board – 32 x 24bit ADC +/-10V Analogue Inputs

More to Come!



DIN41612 Eurocard connector as standard

Standard Connectivity

HILTOP

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The HILTOP software is a scalable modular platform with structured back-end libraries specifically targeted at **Test, Measurement and Automation** applications. **Python** is typically used for implementing customer-focused, automated test scripts, but C/C++ can also be used for test programs. **Script generators** can be created to generate Python test scripts from test specification documents or **DOORS** requirements modules, enabling systems engineers to develop tests with the potential for significant cost savings and reduced time to test.

Database Backed & Data Driven

All test results are stored in an **SQL Database** and can be stored locally or output over LAN to your network. Results are logged by serial number so products can be tracked through manufacture and through life.

HILTOP test solutions provide remote access and control features enabling intercontinental uses when your development and manufacturing are located within different places. Dual control software accessed from either the touchscreen or remote web interface.

python SOFTWARE FOUNDATION

Build your own test scripts in Python and run via LabTOP or ProdTOP

Key Features

open source

We are an open book. Customers have no less access than ourselves. We welcome involvement and collaboration. All software is licensed under LGPL unless prior agreement is made with the customer.

Standard Languages - C, C++ and Python

Abstracted Hardware Testing Framework

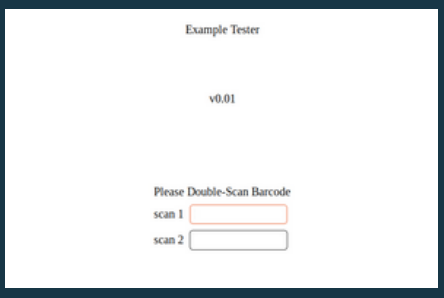
The testing framework is abstracted from physical hardware so only the hardware interface needs to be defined for new hardware testing.

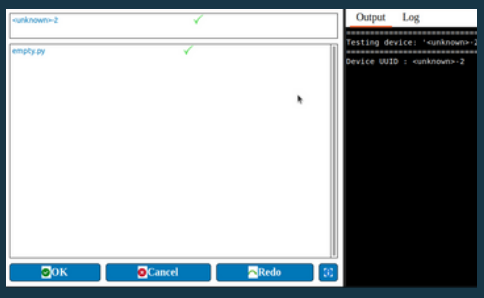
Touch Screen and Barcode Driven GUI

Controlled with a combination of a touch screen and a barcode scanner, the GUI is designed to be used by non-technical operators of production test stations. Each test visibly passes and fails via a tick or cross icon.

PRODTOP

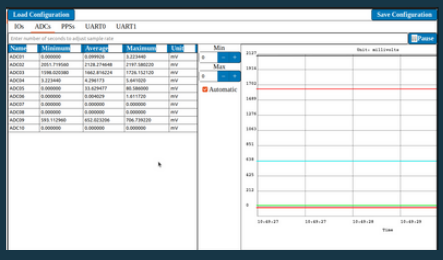
The software behind our HILTOP as an automated production test system. Barcode driven, enabling users to test their products and control test hardware using python test scripts.

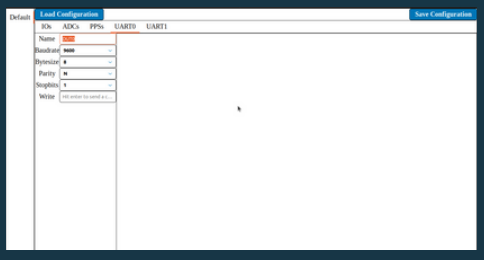




LABTOP

For engineers and technicians to use with HILTOP and Plug-in boards. Exposes all required interfaces for laboratory testing





Ordering Details

The HILTOP allows you to build your own system

- Select the chassis size option to best suit your needs.
- Choose from a pre-configured bare motherboard with multiple onboard interfaces to the Compact or Maxi models with 3 or 6 expansion slots giving direct access to the high-speed backplane and full I/O test and measurement capability.

HILTOP Bare

Visit our online store!

HILTOP Compact

HILTOP Custom

HILTOP Maxi

Product Type	Product Summary	Description
HILTOP Bare	Naked Motherboard which can be installed in a mini-ATX PC case. The HILTOP Bare provides access to 2 x 40 way GPIO headers (Rasp. Pi Compatible) and all built in motherboard peripherals. Note: The high speed Open-VTI backplane cannot be accessed within a standard ATX style PC case. (For backplane options - see Compact and Maxi models)	1.5GHz Broadcom Quad Core ARM Cortex. Lattice ICE40HX8K FPGA 1 x CAN FD channels 1 x RS485/232 Channels Gigabit LAN 3 x USB 2.0 ports / 1x USB 3.0 port SATA Harddrive support Touchscreen (DSI) & Camera (CSI) support 1x 40 Way main board GPIO Headers
HILTOP Compact	3U x 63 HP Instrument with backplane and 3 expansion card slots.	The HILTOP Compact includes all the features of the Bare but offers an industrial quality ¾ size 3U instrument case with a 7" high contrast touch screen, access to all motherboard peripherals including programmable 30V DC PSU & 3 expansion slots providing Open-VTI backplane connectivity.
HILTOP Maxi	3U x 84 HP Instrument with backplane and 6 expansion card slots.	The HILTOP Maxi includes all the features of the Bare but offers an industrial quality 19" full-size 3U instrument case with a 7" high contrast touch screen, access to all motherboard peripherals including programmable 30V DC PSU, 6 expansion slots providing Open-VTI backplane connectivity.
HILTOP Custom	Build your own bespoke Compact or Maxi HILTOP with your logo printed on to the chassis!	The custom includes all the standard features of the HILTOP motherboard, with the option to build or install your own plugin cards.

Please contact us for a quotation based on your specific requirements.
Volume discount and bespoke packages offered to suit your business needs.
All hardware comes with a 12 month return to base warranty