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Packet-Master USB-PDA Power Delivery Analyser

Packet-Master USB-PDA-E Power Delivery Exerciser/Analyser

*The **Packet-Master USB-PDA** is a USB PD Analyser, for FSK and Baseband variants of Power Delivery.*

*The **Packet-Master USB-PDA-E** is a USB PD Exerciser and Analyser, for FSK and Baseband variants of Power Delivery.*

*Each comes complete with our Windows application **GraphicUSB** for capturing and displaying every detail of the PD interactions.*

The Packet-Master USB-PDA from MQP is the world's first dedicated Power Delivery Analyser.

Power Delivery

Power Delivery is a specification allowing USB to provide power in a more flexible and adaptable way. The FSK version uses two-way signalling superimposed on the existing VBUS wire in the USB cable. The BMC version uses two-way signalling on the CC wire of a USB C-cable.

Non-Intrusive Operation

The Packet-Master USB-PDA connects passively between two USB PD devices, and captures all PD activity without influencing the link. So you can be sure that you are seeing exactly what really happens. All the important timings are displayed, along with VBUS voltage and current measurements.

Exerciser Version

The Exerciser version of the USB-PDA will behave as a Provider, Provider/Consumer, Consumer or Consumer/ Provider, and the operation can be manually controlled to perform all the usual PD operations, including Requests, Swaps, Hard Resets and BIST Mode Requests. Simultaneously an analyser Capture may be performed, in order to view how the UUT responds.

Background

The USB-PDA has been designed in conjunction with the PD Compliance Plan, so you can be sure that virtually any non-compliance with the protocol and timings will be flagged in a distinctive colour, and a detailed description of the problem will be displayed.

Report and Analysis Operation

The Packet-Master USB-PDA detects and displays the following in a simple-to-understand yet informative manner:

- Every PD message packet, including full detail of the pre-amble bits, SOP ordered set, header and data objects. Every bit field is analysed, described and any potential non-compliances are highlighted.
- Test Pattern Frames are displayed and analysed to indicate whether they contain a valid PRBS test pattern.
- Bit Stream and other continuous waveforms are displayed, with an analysis of their type.
- The VBUS voltage and current are monitored and displayed, on a zoomable timeline which also shows the actual PD message packets. Discrepancies between voltage and current changes and the occurrence of related messages are clearly shown.
- SOP', SOP'', SOP'_debug and SOP''_debug messages are also displayed.

In minimum display mode, the graphical display shows message sequence headers, allowing a quick overview summary of the significant PD events. These headers can be double-clicked to reveal every PD packet in that segment of the event display.

Resources

The USB-PDA contains both a PD receiver and a PD transmitter, each in FSK and BMC variants. The PDA-E is an interactive exerciser, allowing the USB-PDA to behave as a reference PD device. With the analyser only version, test packets may be generated.

 Software/firmware updates are generally available free of charge from our website.

Plug-In Modules

A special feature of the Packet-Master USB-PDA is the plug-in panel for the connections to the Units Under Test. This has the following advantages:

- Some of the USB-PD connectors are easily damaged by rough handling. If a connector becomes damaged, simply replace the plug-in panel.
- Various different connector styles are available for USB-PD use. Swappable plug-in panels provides the flexibility required.
- It is a feature of USB-PD that extra connectors and adapters can result in voltage losses beyond that permitted for correct PD operation. MQP recommends, and can supply, a plug-in panel with a captive PD cable. This has only two connectors, and therefore meets the required specification, while still providing non-intrusive PD message interpretation.
- It permits immediate support for baseband PD, simply by purchasing a new plug-in module with the appropriate connections.

Requirements

The minimum requirements for the Packet-Master USB-PDA Host are as follows:

- Pentium D - 2.66GHz or better.
- PC with High Speed USB 2.0 port should be dedicated to the USB-PDA.
- Windows XP (Service Pack 1 or better), Vista or Windows 7 or 8.
- CD ROM / DVD Drive
- 2GB RAM
- 100MB space on Hard Disk
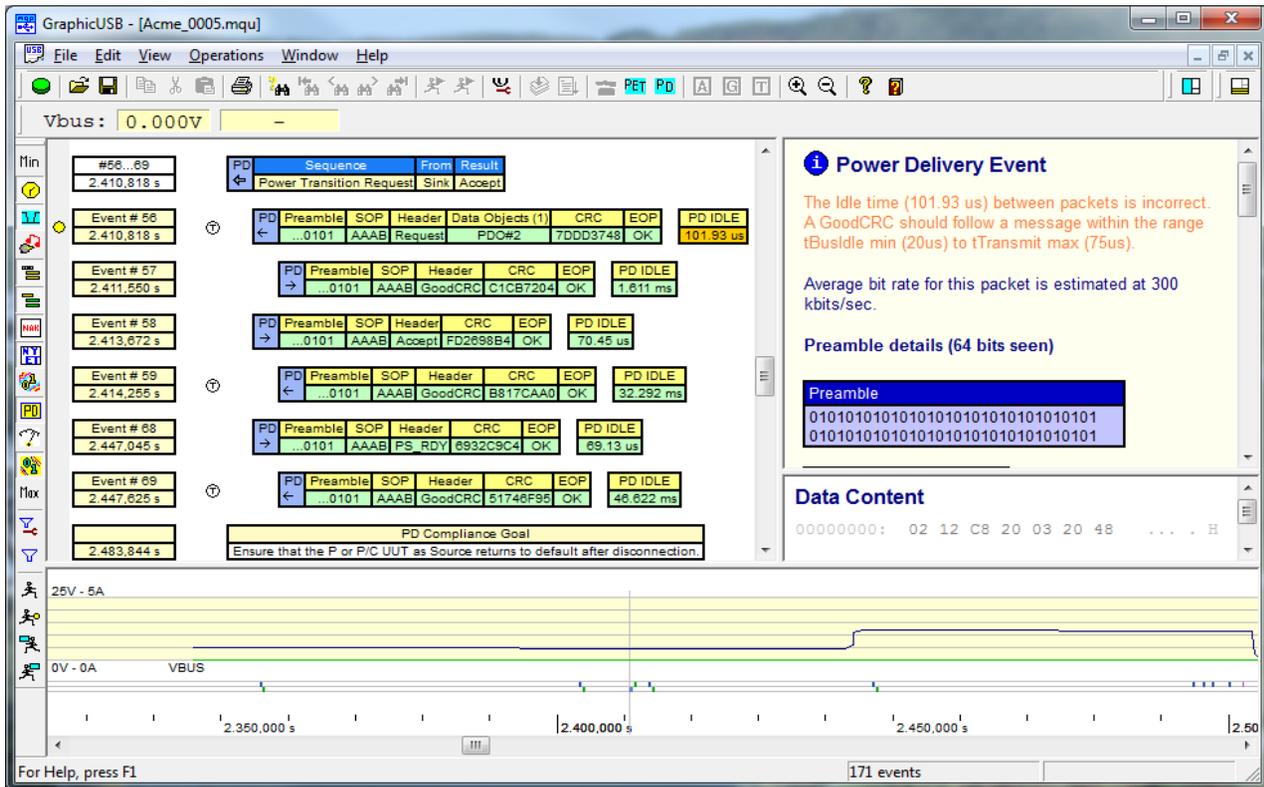
The GraphicUSB Application User Interface

GraphicUSB Application

The Packet-Master product is supplied complete with our GraphicUSB software application.

Event Capture Panel

This panel (on the left) displays the captured events, either in summary header form, or detailing every event which is captured. Any event may then be selected for complete analysis.

Colour is used to draw attention to any specification violations.

Detail Panel

This displays the detailed analysis, down to bit level, of the event selected.

Detailed analysis of any specification violations is available in this panel.

Timeline Panel
VBUS Voltage and Current
Frames Events

In the zoomable panel along the bottom is a VBUS voltage and current display, lasting for the full duration of the capture.

Below the voltage and current waveforms is a graphical representation of the position in time of each PD frame. Hovering over any of these shows a tooltip describing the frame.

Together these displays allow the developer to confirm the timing relationship between messages and voltage/current transitions.

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Physical

USB-PDA (Analyser Only)

Size:	190 x 140 x 70 mm
Weight:	750 gm
Temperature:	0°C - 40°C
Humidity:	20% - 80% non condensing
USB Current draw	Zero mA from USB.
Using the external power supply 9V/2A (included) is the required mode of operation.	

USB-PDA-E (Analyser and Exerciser)

Size:	190 x 140 x 70 mm
Weight:	750 gm
Temperature:	0°C - 40°C
Humidity:	20% - 80% non condensing
USB Current draw	Zero mA from USB.
Using the external power supply 24V/8.3A (included) is the required mode of operation.	

*The Packet-Master USB-PDA is the first of a number of development and compliance testing instruments for Power Delivery being made available by MQP Electronics. Further products will include a Comprehensive PD Compliance Tester, developed to fully meet the testing requirements of the USB-IF.

Comparison Chart

Feature	USB-PDA	USB-PDA-E	USB-PDT*
Analyser	✓	✓	✓
Exerciser		✓	✓
Compliance Tester			✓
PD VBUS Generator		✓	✓
PD VBUS Load			✓
VBUS Voltage and Current Monitor	✓	✓	✓
Analyser Capture Start/Stop Controllable from Unit	✓	✓	✓
External Power Supply Provided	✓	✓	✓
RoHS Compliant	✓	✓	✓
Signal Quality Analysis			✓
BMC and FSK Eye Diagram Compliance Tests			✓
FSK Noise Spectrum Analysis and Compliance Tests			✓

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Product Coding

This table describes the system elements at the time of preparation of this brochure. Other plug-ins types may be supplied to order, please enquire.

Designation	Description	Availability
USB-PDA-A	Analyser only. At least one plug-in should be ordered to complete the unit.	Now
USB-PDA-E	Exerciser. Can act as PD port partner, plus analyser function. At least one plug-in should be ordered to complete the unit.	Now
PDA-FA3-CAP	Plug-in . Captive cable, USB3 PD Standard-A and Standard-B Connectors.	Now
PDA-FA3M-CAP	Plug-in . Captive cable, USB3 PD Standard-A and Micro-B Connectors.	Now
PDA-FA3-CON	Plug-in . Receptacles, USB3 PD Standard-A and Standard-B.	Now
PDA-BA3-CAP	Plug-in . Captive Cable, C to C Connectors.	August 2014

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