

VersaPHY™

Technology Overview

Shenzhen, China

April 10, 2008



Introduction

- VersaPHY™* technology, as documented by the approved 1394 Trade Association document 2006015 “VersaPHY Additions to IEEE-1394”, is a 100% compatible extension to IEEE-1394. VersaPHY enables lower cost implementations by allowing simple devices to connect to IEEE-1394 simply.

*VersaPHY is a trademark of Quantum Parametrics LLC

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Agenda

- What is VersaPHY
- Why VersaPHY
- VersaPHY Status
- Markets
- Profiles
- Quantum Parametrics and VersaPHY

What is VersaPHY?

- VersaPHY enables applications to connect as directly as possible to the 1394 PHY layer, thus creating a **Versatile PHY** layer while maintaining plug-n-play attributes through VersaPHY defined registers.
 - 100% compatible with IEEE-1394!
- In addition, VersaPHY adds permanent or semi-permanent addressable labels (VP-Labels) that may be used to address a device or individual functions within a single device.
 - Communication with existing VersaPHY devices can resume immediately after bus reset (For existing devices, NO device discovery needed after bus reset)
- VersaPHY capitalizes on 1394's inherent peer-to-peer architecture by allowing VersaPHY devices to send unsolicited responses.
 - In effect, this allows the VersaPHY device to send a packet any time an event occurs and allows other devices to collect the information, thus reducing system overhead.
 - Controllers may also poll VersaPHY devices.

Why VersaPHY

- There is a need to
 - connect simple devices to a high speed network (backbone) that has deterministic latency
 - Localize with 1394 and distribute ***
 - NO 1394 specific software is required in the VersaPHY device
 - connect digital streaming devices (ex: security cameras) simply (like their analog counterpart)
 - Use 1394 like a data pipe
 - connect to a high speed backbone that allows flexible wiring (daisy chain, tree, redundant loops)
 - IEEE-1394b (Beta) PHY provides all of these benefits
 - connect to a high speed serial network to reduce the number of conductors
 - Automotive, machine automation, test, robotics, military, aerospace, etc...
- NO new silicon required – VersaPHY may be implemented today!
 - Maybe integrated in with PHY layer or on top of existing PHY implementations
 - Very low risk development path to high volume production!
- VersaPHY devices coexist with traditional 1394 devices on the same network!
 - There is a need for high level protocols on 1394, this continues uninterrupted

VersaPHY Status

- Core VersaPHY specification approved
 - “VersaPHY Additions to 1394” approved by the 1394 Trade Association in January 2008
- “General Purpose Input/Output Profile” completed first general 1394TA vote in March
 - Ballot Review Committee addressing 4 technical comments
- “I²C Master Profile” specification in Industrial and Instrumentation Working Group voting process
- “VersaPHY Mil-Std-1553 Profile” specification under development by SAE

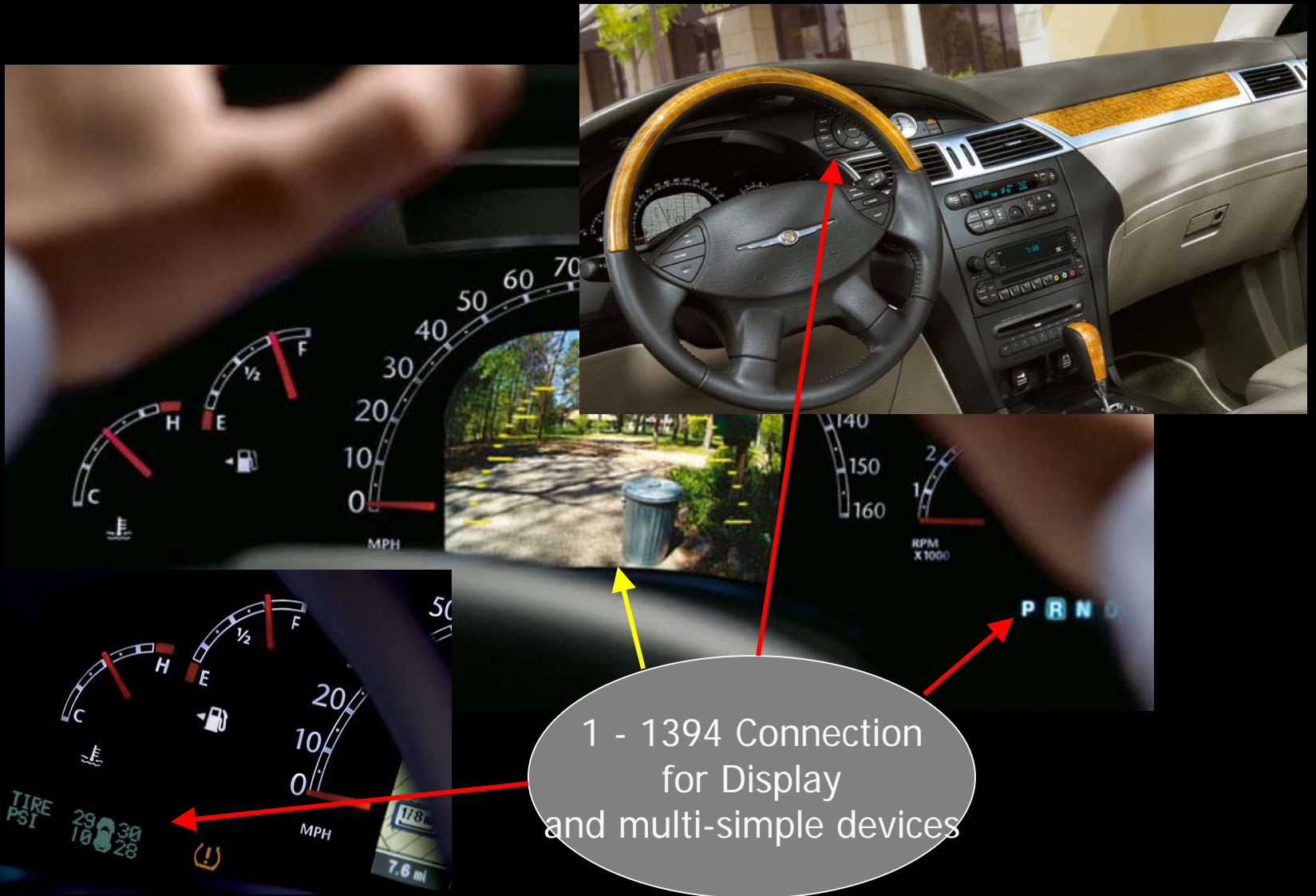
Markets

- VersaPHY expands the traditional 1394 market to include simpler devices typically serviced by other interfaces
 - This list includes but is not limited to:
 - Sensors, actuators, A/Ds, switches, relays, displays, key pads, cameras, motor controllers, etc...
- Connect devices with legacy interfaces (RS232, 422, 485, I2C, CAN, 1553, etc...) to 1394's high speed guaranteed latency bus
- VersaPHY's target market is simple applications that benefit from connecting to a high speed, low latency network (1394)
 - Automotive, security, industrial, test, automation, robotics, machine vision, medical, aerospace, military, etc...

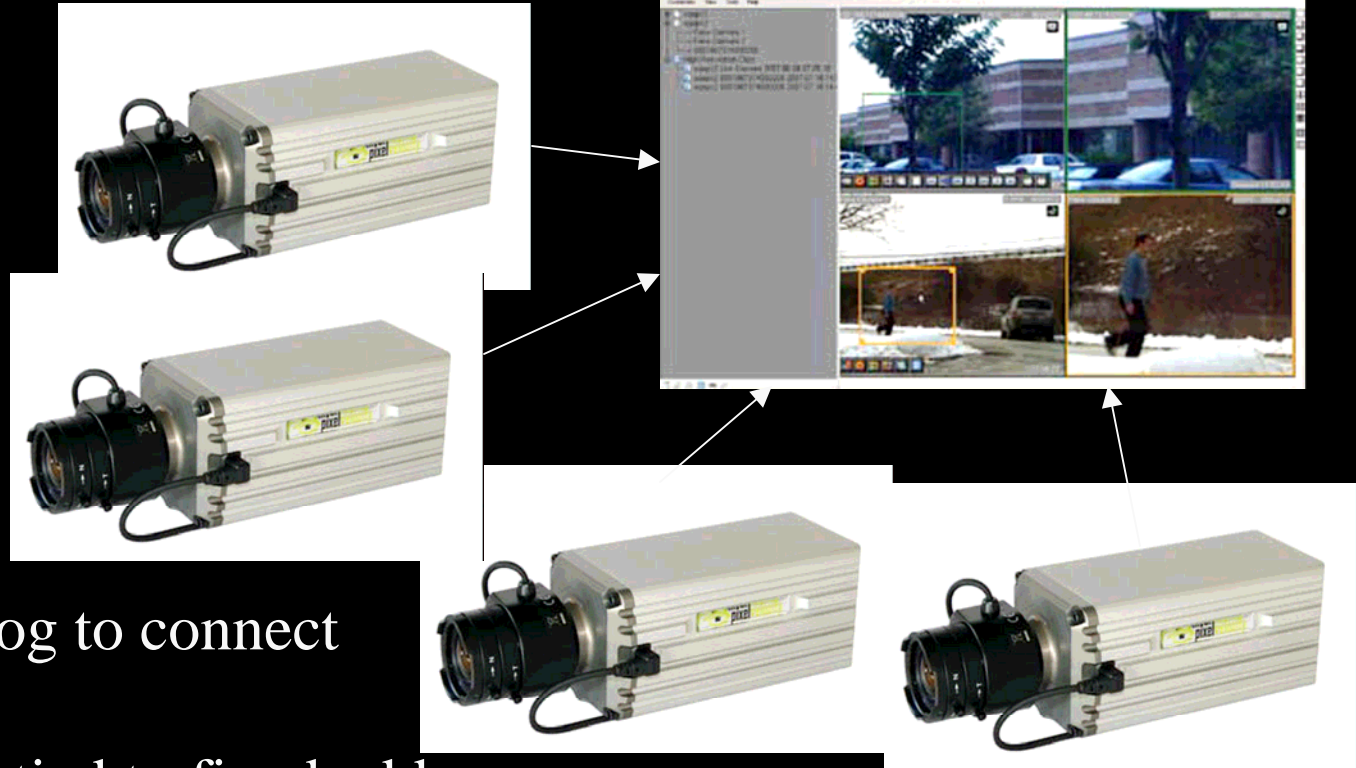
Industrial and Medical



Mix of High and Low Speed



Security and Surveillance



Simple as analog to connect

- Fixed address
- Isoch channel tied to fixed address
- Few controls handled simply

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QP VersaPHY Technology

- Quantum Parametrics (QP) is the inventor of VersaPHY Technology
 - The idea came from our interaction with customers
 - VersaPHY directly reflects the needs expressed by a diverse set of customers with similar problems
- In May '08 QP will be offering VersaPHY Development Kits
 - Designed to enable VersaPHY product development
 - First kits target simple I/O and legacy I/O bridging
 - Second generation to support audio/video streaming

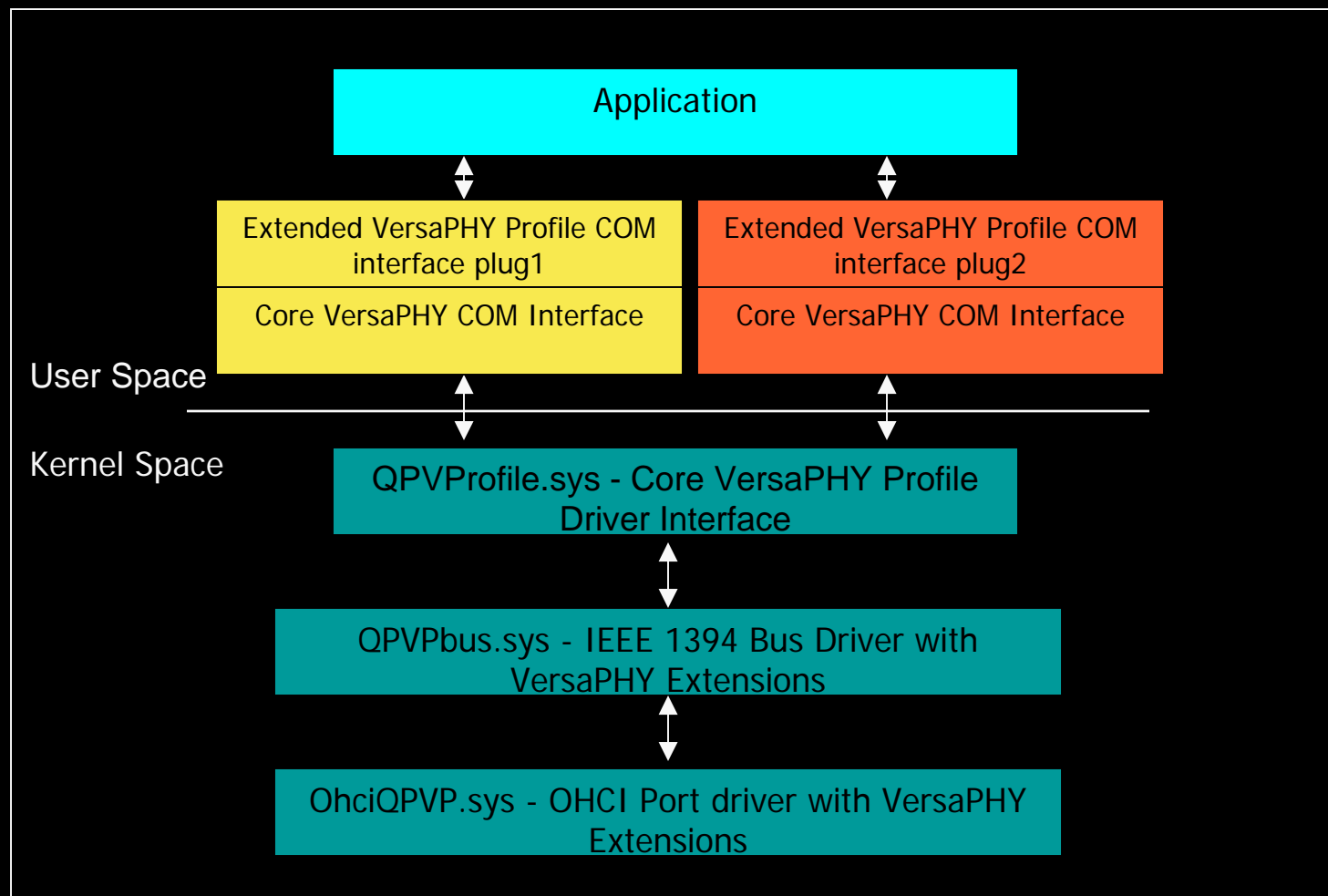
VersaPHY Developer Kits

- QP plans to release multiple VersaPHY Developer kits over the coming months
 - Each kit will consist of
 - Controller Software Developer Kit (SDK)
 - VersaPHY device hardware platform
 - Application module
 - Example application source

VersaPHY Controller Software Framework

- VersaPHY Framework Stack
 - Provides an API to core VersaPHY profile interface
 - Abstracts the low level VersaPHY implementation from device profile developers
 - Device profile development is done in User Space through the Core VersaPHY COM interface.
- Windows XP support

VersaPHY Framework OHCI Stack

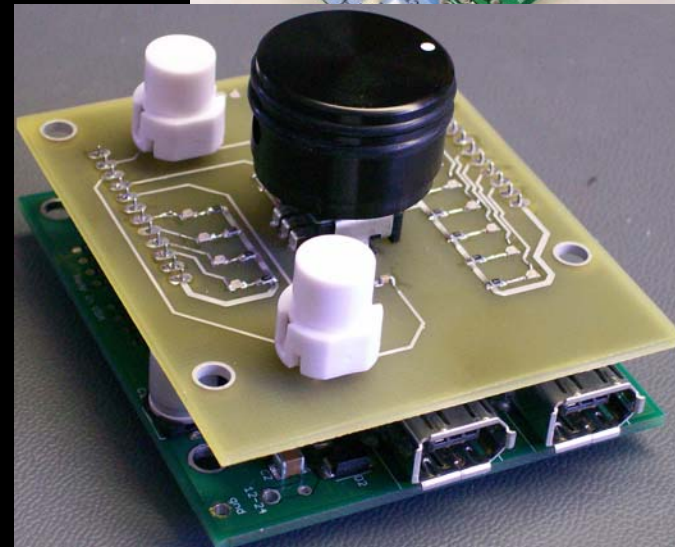
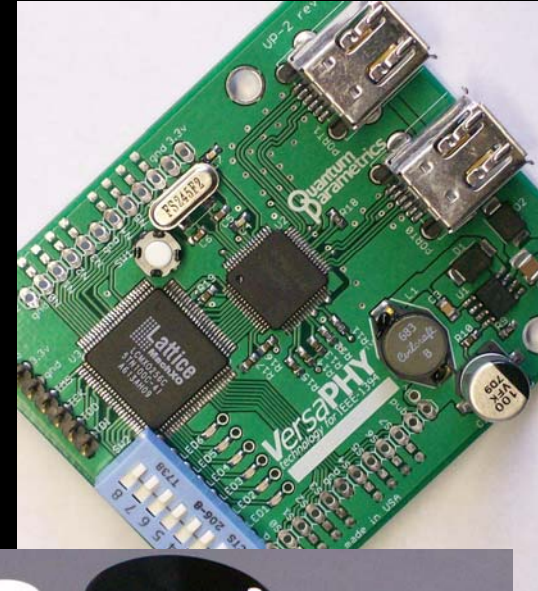


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← 1394 Bus →

VP-GPIO-1DK

- Supports 16 configurable inputs/outputs
- Cable powered
- Easy connection to application board
 - See Volume control
- Dip switch settable VP-Labels
- Supports unsolicited response on input change
- Limited release May '08
 - VP-GPIO-1DK - \$99.99
 - Volume Control Application \$49.99



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Volume Control Register Set

Device
Identification

GPIO
Specific

Block	Offset	Bits 0:7	Bits 8:15	Description
0	0	0xC0	00,Phy_ID/VP-L	Always enabled and responds immediately
0	2	0x00	0x07	Power not supported
0	4	0xC3	0x00	Self enabled, Short ID, GUID Available
0	6	0x80	0x00	Profile: GPIO - Revision 0
0	8	0xNN	0xNN	GUID
0	A	0xNN	0xNN	GUID
0	C	0xNN	0xNN	GUID
0	E	0xNN	0xNN	GUID
1	0	0x00	0x00	Model 0
1	2	0x01	0x01	GPO and GPI banks
1	4	0x00	0x00	
1	6	0x00	0x00	
1	8	0x00	0x00	
1	A	0x00	0x00	
1	C	0x00	0x00	
1	E	0x00	0x00	
2	0	LEDs 8-11	LEDs 0-7	Write GPO Value
2	2	0x0F	0xFF	Output mask
2	4	0x00	0x00	
2	6	0x00	0x00	
2	8	0x00	0x00	
2	A	0x00	0x00	
2	C	0x00	0x00	
2	E	0x00	0x00	
3	0	0x00	0x0,en0,en1,sw1,sw2	Read GPI Value
3	2	0x00	0x00	
3	4	0x00	0x00	
3	6	0x00	0x00	
3	8	0x00	0x00	
3	A	0x00	0x00	
3	C	0x01	0x00	Debounce enable
3	E	0x00	0x8F	Debounce count

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Thank You!

About Presenter:

Richard Mourn

President

Quantum Parametrics LLC

625 Elkton Dr., Suite A

Colorado Springs, CO 80907

Phone: 719.592.1394

Email: rmourn@quantumparametrics.com

Web: www.quantumparametrics.com



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