USI | Universal Stylus Initiative

Welcome

30 May 2016

Agenda

- Introduction - Why USI?
- Scope & Features
- Demonstrations
- Technical Highlights
- Status & Milestones
- Stylus Forecast & Future Work
- USI Member Statements
- How To Join
- Q&A

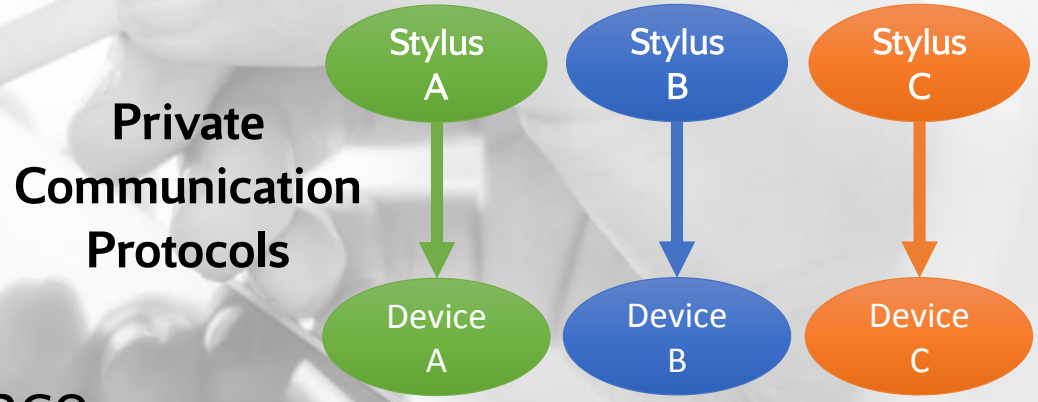
Why USI?

Today

No active stylus standardization.

existing solutions are -

- proprietary
- expensive
- deliver an inconsistent experience



End User Desire:

A stylus that's **personal**

customizable attributes that travel with the stylus

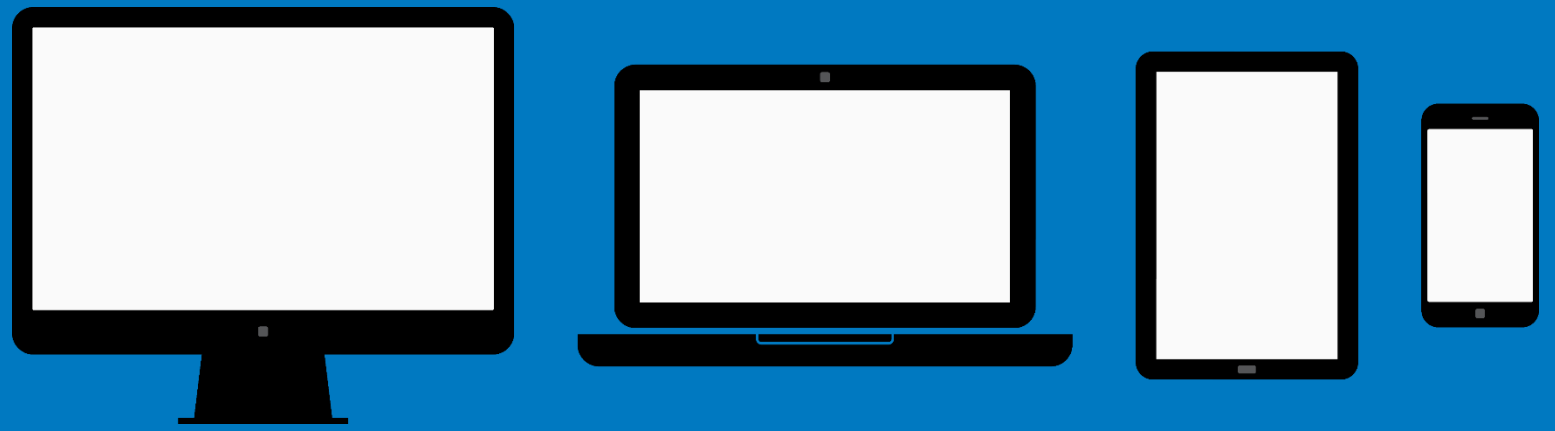
- color
- weight
- stroke

End User Desire:
A **predictable** stylus experience

- consistent, best-in-class performance
- expansive feature-set

End User Desire:
A truly **interoperable** stylus.

- one stylus that works on every device



Why USI?

Industry Desire

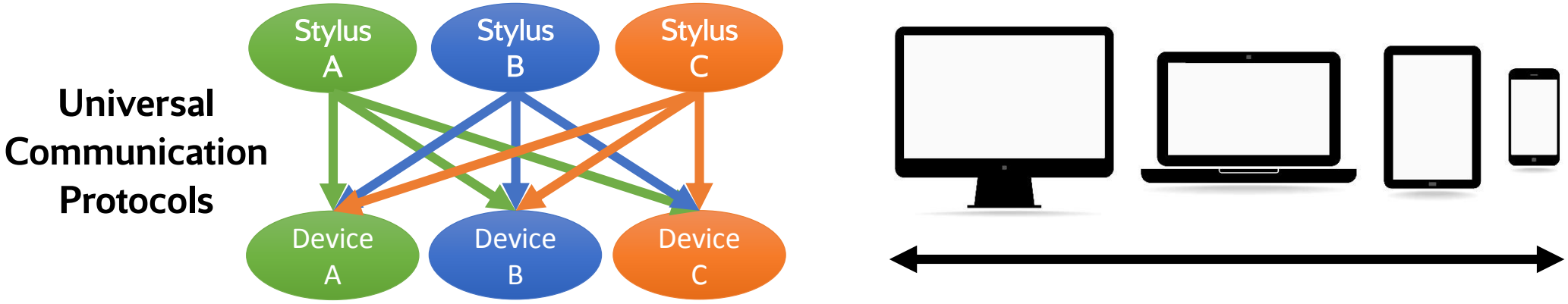
Broad penetration of stylus.

- increased market opportunity
- drive scale for cost reduction

Why USI?

Goal

Deliver an industry standard for active stylus.



USI

Founding Members

Atmel
DELL
EETI
禾瑞亞科技股份有限公司
eGalax_eMPIA Technology Inc.
FocalTech
Hanvon®
ELAN
Synaptics
lenovo
wacom
intel
SHARP
waltop

Growing Membership

ADVANCED SILICON
CIREL SYSTEMS
Inspired by Innovation
CIRQUE
G2touch
Genius
GP Batteries
GOODiX
ILITEK
I Love Innovation
LG Display
Himax
Drive for better vision
hp
JDI
Japan Display Inc.
MELFAS
making electronics friendly and smart
MONT BLANC
OptoFidelity
Parade
PRIMAX
Raydium
SiS
SMART
solidyear
life.augmented
SUNREX
TACTILE AUTOMATION INC.
UC LOGIC
Weida Hi-Tech 威達高科

As of May 30, 2016. See the USI website for a current list of members.

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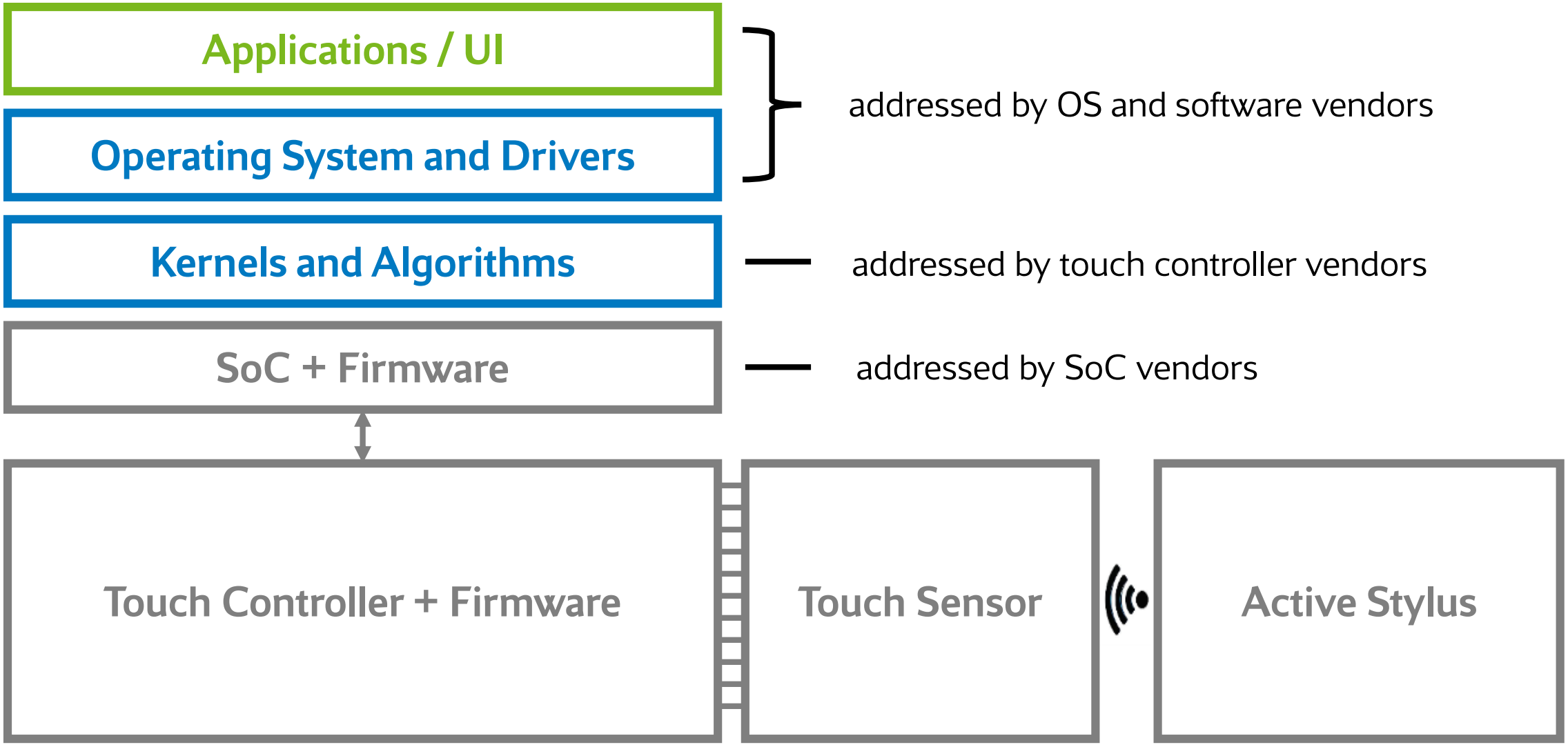
Scope & Features

Scope

Areas to Standardize

- stylus discovery mechanism
- packet formats to communicate key information (such as pressure, button info)
- facilitate low-cost as well as high-end, premium implementations
- mechanism for vendor extensions

Scope


Applications / UI
Operating System and Drivers
addressed by OS and software vendors
Kernels and Algorithms
addressed by touch controller vendors
SoC + Firmware
addressed by SoC vendors
Touch Controller + Firmware
Touch Sensor
Active Stylus

Scope

Applications / UI

Operating System and Drivers

addressed by OS and software vendors

Kernels and Algorithms

addressed by touch controller vendors

SoC + Firmware

addressed by SoC vendors

Touch Controller + Firmware

In Scope
- frequency
- modulation
- etc.

Out of Scope
- firmware implementation
- register definition

Touch Sensor

In Scope
- constraints on electrical charge transfer

Out of Scope
- type/material
- patterning

Active Stylus

In Scope
- frequency
- modulation
- etc.

Out of Scope
- firmware implementation
- register definition
- physical/industrial design

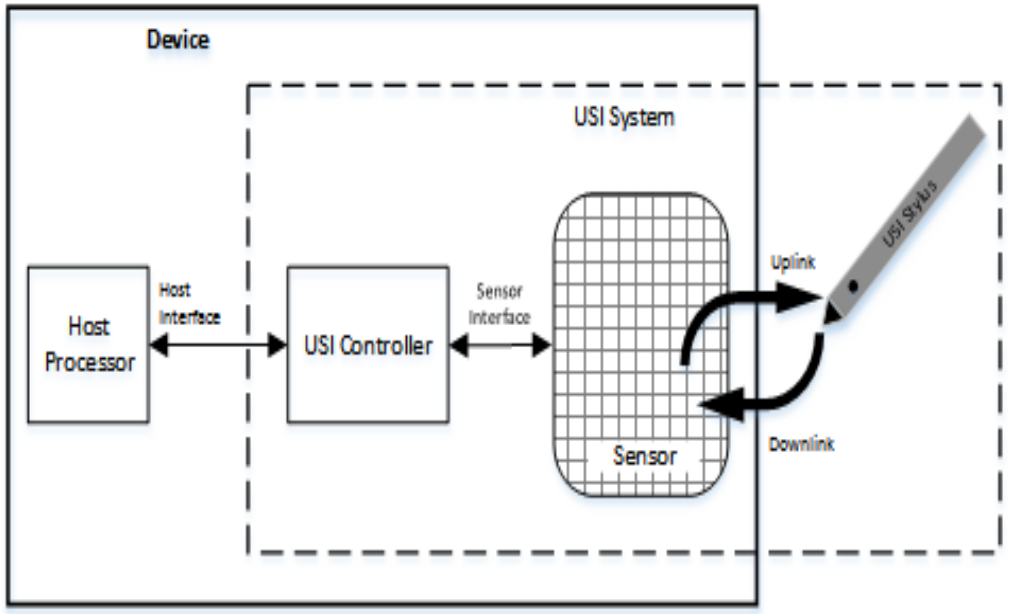
Scope

Not specified by USI

- stylus industrial design / look and feel
- hardware/firmware implementation in touch controller or stylus IC
- touch sensor technology
- software APIs for Stylus data access

Basic Concept

- **'USI System'** comprises of a USI-compatible touch controller and stylus
- USI defines the communication between an active stylus and a touch controller
- two-way communication
- Physical Layer defines the frequency selection, modulation, timing, etc.
- Link Layer defines the communication protocol and information exchange



Efficient Communication - No Side-band Channel Required!

High-Level Features

Use Cases

- Single Stylus, Single Device
- Single Stylus, Multiple Devices
- Multiple Styluses, Single Device
- Simultaneous Touch and Stylus
- Dual-Mode Support for Co-Existence with Legacy/Proprietary Protocols

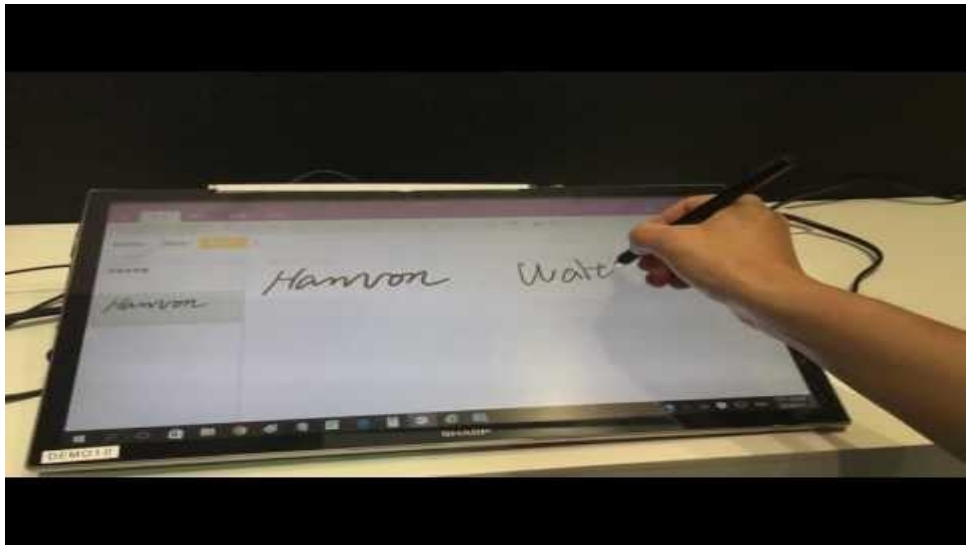
Features

- Low Latency
- High Resolution
- Force/Pressure Sensing
- Tilt, Twist & Erase Functions
- Low Power/Long Battery Life
- Strong Noise Immunity

Support for Vendor-Defined Extensions Allows for Differentiation!

USI Stylus Inking Demonstration

Hanvon, Sharp, Waltop



https://www.youtube.com/watch?v=7SSoZvvBdso

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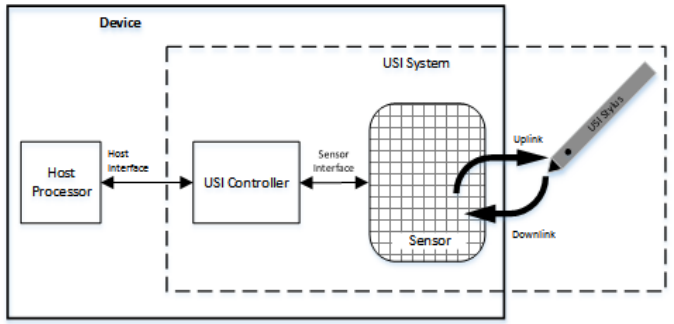
Technical Highlights

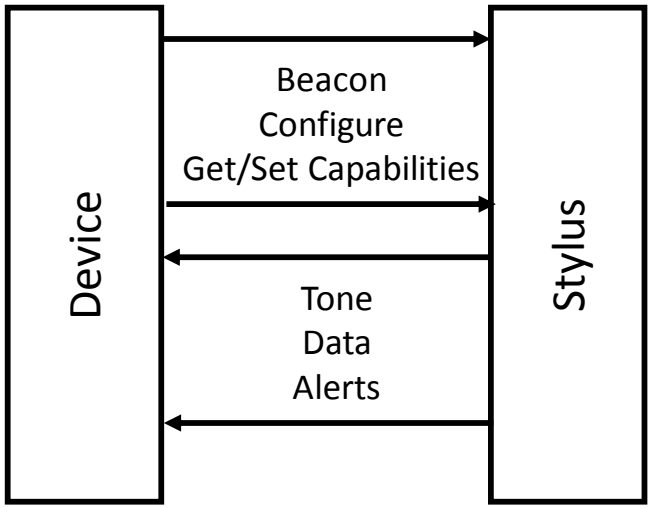
Key Technical Highlights

1. Robust, Two-Way Protocol
2. Multiple, Simultaneous Stylus Support
3. Rich Features and Extensibility

1. Robust, Two-way Protocol

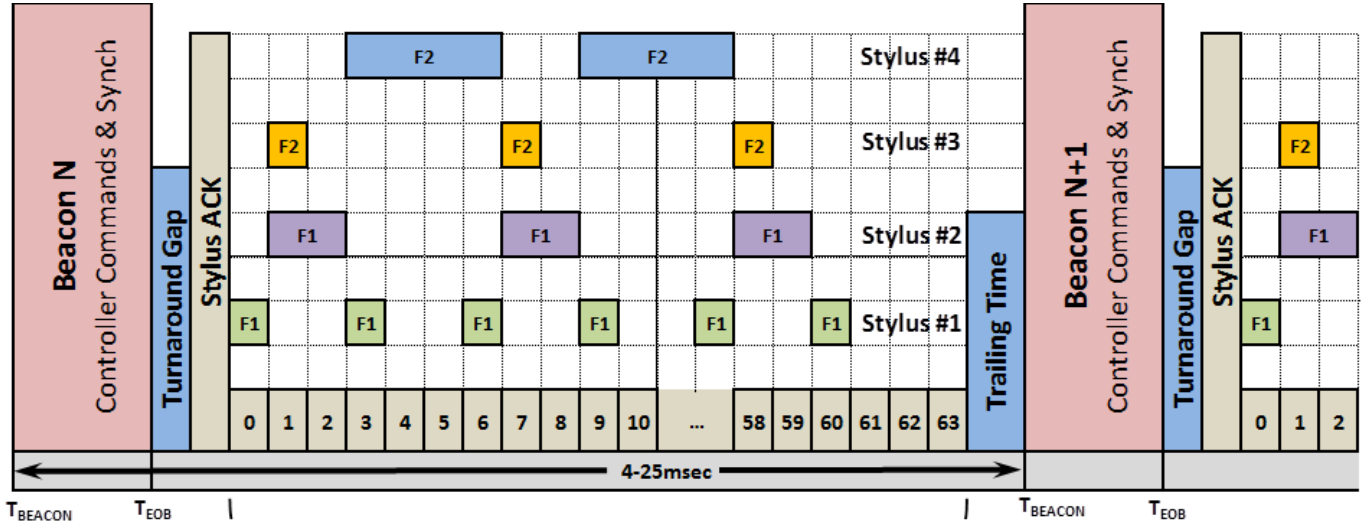
- Two-way protocol is fundamental building block for dynamic discovery and interoperability
  - Stylus can tune to device capability instantly
  - No need for Bluetooth or other sideband communication
- Allows the device to tell stylus to transmit at the 'right' frequency at the 'right' time
  - Provides best noise avoidance techniques
  - Supports all types of sensor technology from OGS to metal mesh
  - Supports hybrid In-cell and full In-cell panels
- Supports legacy co-existence





2. Multiple Simultaneous Stylus Support

- multiple styluses can transmit at different timeslots
- multiple styluses can transmit at different frequencies
- device detects multiple styluses and configures each one in the first frame of communication with that stylus
- up to 6 simultaneous styluses can be supported



3. Rich Features and Extensibility

- Improved capabilities over existing stylus being used with Windows
  - Improved ink accuracy & writing recognition with >2x report rate
  - Supports simultaneous pen + touch OS commands
- Extends the inking experience with advanced features
  - Goes beyond standard pressure, buttons and eraser capabilities
  - Tilt and twist, 9-axis motion sensor (Accel, Gyro, Mag) data
  - Airbrush functionality
  - Personalized ink settings maintained across apps and across devices
- Additional vendor extensibility

Technical Highlights - Recap

1. Robust, Two-Way Protocol
2. Multiple, Simultaneous Stylus Support
3. Rich Features and Extensibility

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Status & Milestones

USI Major Milestones

USI kick-off	Q4 2014
Operations and founding members established	March 2015
Working Group scope and requirements complete	March 2015
Public Launch & Open to New Members	April 2015
First USI Plugfest	December 2015
Second USI Plugfest	March 2016
USI 0.9 Specification Draft Release	March 2016
USI 1.0 Specification Release	June 2016
Initial Certification Program Established	Q4 2016
Expected First USI Product Release	Q4 2016

Stylus Forecast & Future Work

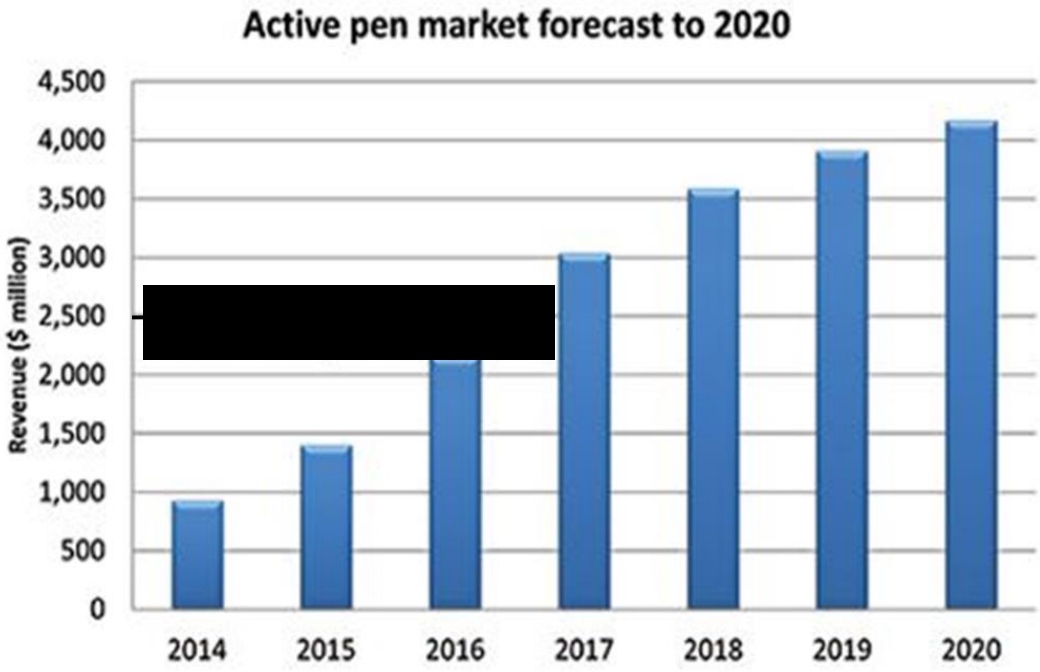
Active Stylus Module Market Forecast

Stylus market ramp underway

- many OEMs offering stylus and writing app solutions as a standard feature

Improvements in stylus capability driving growth

- apps seeing significant reductions in ink latency and algorithm performance to provide a better user experience



Source: Touch Display Research
Forecast active pen writing module (includes pen sensor and controller IC) revenue

Strong Market Growth Predicted For Active Pens

Future Plans

- Certification & Compliance Program
- USI 2.0 (new features)
- Development and promotion of other ink & stylus related initiatives
- Developing a new touch interface standard
  - collaboration with MIPI Alliance

Join USI

Membership Benefits

Benefit	Promoter $15k / year	Contributor $8k / year	Adopter $4k / year
Eligible for Board of Directors seat (Board seats are not guaranteed)	✓		
Eligible for Working Group Chair position	✓		
Approval of Final Specifications (Board of Directors only)	✓		
May propose new work streams	✓		
Voting Rights within Working Groups	✓	✓	
May participate in technical, communications and certification Working Groups	✓	✓	
Access to specs and test specs (Adopters will be provided access to V0.7 and later)	✓	✓	✓
May apply for Certification (when available)	✓	✓	✓
May attend special all member meetings	✓	✓	✓
May publicly promote company's involvement in Universal Stylus Initiative	✓	✓	✓

How To Join

- Request and review the membership materials
  - USI Membership Levels and Benefits
  - USI Bylaws
  - USI IPR Policy
  - USI Certificate of Incorporation
  - USI Participation Agreement
- Email your executed Participation Agreement to: usi-membership@workspace.universalstylus.org.
- Active member when fully executed Participation Agreement and dues received by USI.

More Information Available At www.universalstylus.org

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Thank You!