

PMatrix™

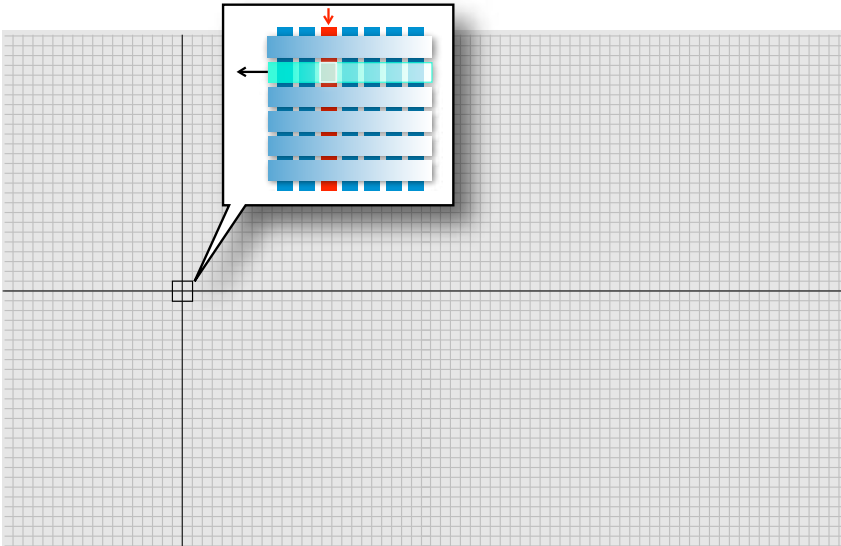
The unparalleled Multi-Touch IP core and detection firmware



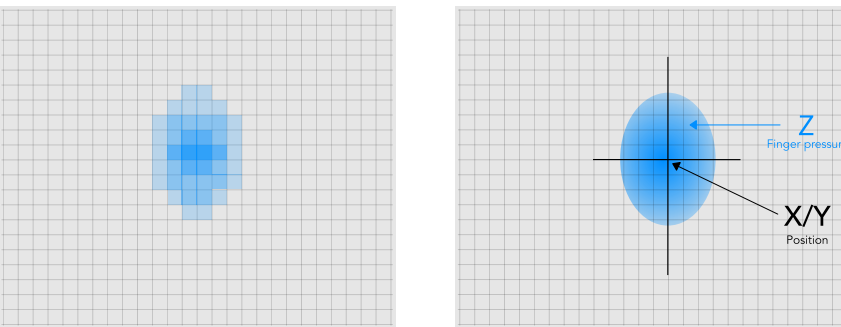
PMatrix™ is the most powerful engine for Multi-Touch technology. It runs as an IP core, and/or chip firmware and/or software on controllers. PMatrix scans and delivers an exact representation of what's happening on the touch-panel. The Multi-Touch driver dynamically updates the cursor list, enabling any application to control the Graphical User Interface objects.

Unlike most multi-touch controllers, PMatrix™ is designed from the bottom for embedded devices (like the award-winning Lemur), thus discarding you from using power consuming host drivers or DSPs. PMatrix™ brings the best of multi-touch to your device without tradeoffs.

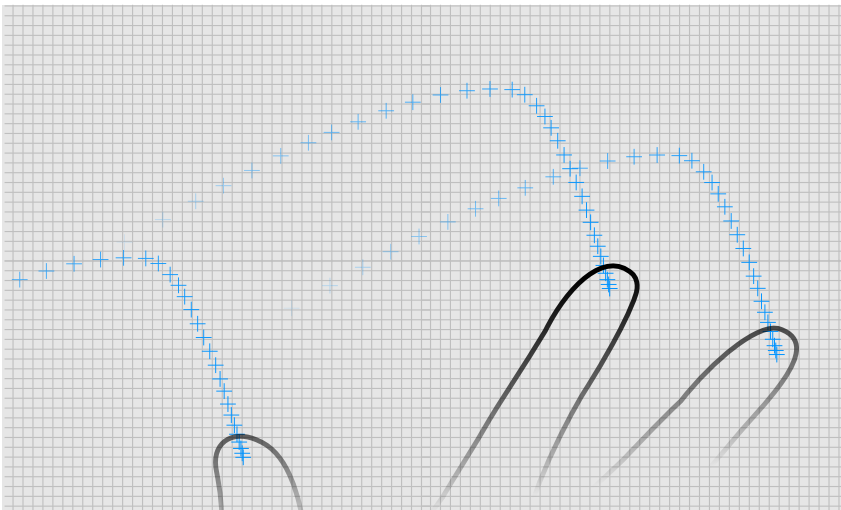
Scanning Engine : gets the state of each individual node



Touch Area detection : associates cursor to each contact area



Tracking : monitors the position, finger pressure and status of each cursor



FEATURES :

- Intelligent and robust scanning of the touch-panel
- True Multi-Touch: unlimited number of touches detection and tracking
- Block oriented design
- Portable and lightweight
 - o Runs on controllers or any embedded processing device
 - o No DSP required
- Low memory and code footprint
- Efficient algorithms enabling low power consumption
- Power modes:
 - o Sleep
 - o Low power
 - o Normal
- Dynamic cursors management (touch association, status and tracking)
- Instantaneous contacts detection

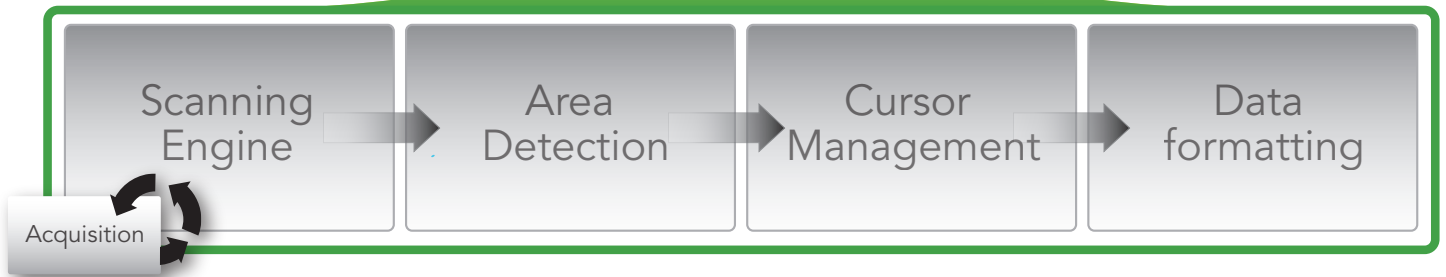
PERFORMANCES :

In comparison to capacitive sensing, resistive technology brings :

- Versatility : it detects fingers, gloves, stylus and any contact object
- A lower solution cost
- Lower power consumption
- Faster scanning rate
- Lower overall latency
- Precision is linear (same in the center and at the borders)
- Performance is not affected by the size of the touch-panel or the number of touches
- Transparency and soft touch enabling user experience equivalent to the best capacitive touch-panels

BUSINESS MODEL :

- Software & IP license



GENERAL	
Scalability	Technology implemented from 2" to 15.4"
Requirements	Works with resistive touch-panels that meet Stantum's guidelines. These touch-panels are available for mass production from leading manufacturing partners.
Intellectual Property Portfolio	Worldwide patents anteriority. Priority date February 2004, granted in Europe and China : EP1719047, CN100447723C Patent applications in the USA, Europe, Asia : WO2005091104, US2007198926, JP2007527061
Software implementation	C++ on MCU
Hardware implementation	RTL/VHDL on ASIC or FPGA Equivalent ASIC gates (expressed in NAND gates equivalent): - AreaDetection: 12k gates and 10kbits of RAM. - IOControl: 14k gates - Config interface: 5k gates - ScanningSystem: 3k gates
Connectivity	USB (vendor or Multi-touch HID), SPI, I2C, USART
PERFORMANCES	
Maximum number of fingers or pointers	Unlimited
Consumed Mips	Cursor management : below 4Mips on a 32bits MCU Other functions : hardware or MCU based
Precision (Pointing accuracy)	1/2 of the touch-panel's matrix resolution
Cursor tracking accuracy (smallest incremental detectable movement)	Up to 1/32 of the touch-panel's matrix resolution for slow movements and 1/9 for fast movements
Jitter	Close to zero
Levels of Finger-pressure	3 distincts / 256 in continuous mode
SOLUTION IMPLEMENTATION EXAMPLE : STANTUM MDK-4.3	
Minimum activation force	10g (0.1N) (soft touch)
Touch-panel scanning rate	180Hz
Detection latency	Below 4ms
Overall latency	Below 5ms
Power consumption	35 mA*
Power supply	5V** (USB)

* can be 5 times lower for single chip & lower voltage implementations

** Pmatrix can run on hardware powered with voltages as low as 1,2V