

## TouchNetix to demonstrate breakthrough touchscreen IC highly optimised for automotive and industrial applications

- *New aXiom series of touchscreen controllers from TouchNetix enables radical new display user interface designs featuring curved and contoured overlays, hover and proximity functions, force sensing and integrated haptics control*
- *Multiple performance advantages over existing touchscreen controllers include extreme immunity to conducted noise, ultra-low RF emissions, dramatically reduced risk of premature touchscreen failure, superior sensitivity to touch using wet or gloved fingers, and support for large and non-standard display form factors*

TouchNetix, a manufacturer of system and component technology for high-performance touchscreens, will demonstrate its aXiom series of touchscreen ICs, marking a breakthrough in the performance and capabilities of capacitive touchscreens for the automotive and industrial markets.

The aXiom AX112 is the industry's first touchscreen controller to be designed specifically for automotive and industrial applications. A superior alternative to the modified consumer-grade touchscreen controllers supplied to the industrial and automotive markets today, the AX112 enables OEMs for the first time to:

- Design responsive touchscreens that have a thick, varying-thickness or contoured overlays while maintaining uniform sensitivity across the whole screen's surface
- Reliably implement sophisticated hover, proximity, touch and concurrent force-sensing functions with a single capacitive touchscreen IC which also integrates low latency haptics control. With this combination, OEMs can realise 3D touch effects.
- Support touchscreen designs in arbitrary and non-standard display formats, including ultra-wide aspect ratios and non-rectangular form factors
- Achieve reliable sensing performance in the presence of multiple high-power noise sources
- Easily meet CISPR25 Level 3 specifications for radiated emissions without implementing expensive noise counter-measures
- Dramatically reduce the risk of early touchscreen failure due to materials degradation in hot and humid environments

The aXiom controllers have been designed from the ground up for operation in harsh and noisy industrial and automotive environments and over a wide temperature range. Its all-new, highly digital architecture gives it performance advantages that are impossible for modified consumer-grade touchscreen controllers to match.

The aXiom products owe their outstanding performance to a combination of a novel analogue front end which uses a narrowband, low-voltage sinusoidal drive waveform, an innovative seamless frequency-diverse capability, and a high-performance proprietary digital signal processor (DSP)

engine. The most striking feature of this new architecture is its high signal-to-noise ratio (SNR) of 80dB, compared to the typical 50-55dB of competing products in the market.

This high SNR is enabled with TouchNetix' aXiom controller while driving the sensor at a low DC-neutral  $2.5V_{pk-pk}$ , whereas other controllers often use a higher drive voltage, sometimes even +30V or more to achieve even a modest SNR. The aXiom IC's low drive voltage produces very low levels of radiated emissions. The DC neutral bias also dramatically reduces the stresses experienced by the touchscreen materials. High drive voltages can result in optical damage and even metal migration - a form of galvanic corrosion - in the sensor material leading to premature failure of the touchscreen sensor stack.

The aXiom IC's high SNR also enables reliable multi-point touch sensing through thick overlays, including acrylic of 10mm or with an air gap in the stack, and even when the user wears gloves. Touch response to wet fingers, or when the screen is wet, is also superior to that of existing touchscreen controllers.

The chip's powerful DSP engine enables micro-adjustment of the sensitivity at each node in the sensor matrix: the screen's touch-sensing behaviour can be tuned regionally to provide uniform responsiveness to touch across a screen with an overlay of variable thickness. This allows OEMs to rethink the display user interface (UI), building in contours, ridges or valleys to guide the user's finger while the user looks away from the screen.

The aXiom controller can also reliably perform capacitive proximity sensing at a distance of up to 15 cm, and position sensing (hover) of a finger as much as 5 cm distant from the screen.

In addition, the AX112 integrates concurrent force sensing and low latency, autonomous, region definable haptics control, to allow the touchscreen to guide the user's finger through space to their chosen button, touch it, and only register a button press when force is detected at the button's location. The AX112's high-performance force-sensing measurement engine detects displacement of as little as 5  $\mu\text{m}$ .

The aXiom controller ICs support touchscreens with up to 56x56 sensing channels, and touch and force-sensing sampling rates of more than 200Hz. They are suitable for use with displays bigger than 15.6" diagonal, and in non-standard form factors and arbitrary aspect ratios. TouchHub development software is provided with the aXiom controllers to ease the design and tuning of touchscreen designs.

The AX112 will be available for sampling in Q4/2019 and will be AEC-Q100 Grade 2 qualified by Q2/2020. For information on pricing and to request samples or a datasheet, contact TouchNetix directly at [www.touchnetix.com/contact](http://www.touchnetix.com/contact).

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