

## Executive Summary

The **Tango** product (further Tango) is a semitransparent LCD screen attached to the inner surface of the motorcycle helmet's visor and connected with flexible wires or via wireless link to small separate pocket-size module called **AkaTango (AT)**. This AT module is essentially pocket PC with some special interfaces (like A/D, GPS, etc...). TS provides information to display as well as power for the LCD screen. The information can contain reports of digital/analogues sensors, maps, news feeds, other indications.

Motorcycle helmet sounds like most attractive application since when riding motorcycle it is extremely important to keep eye on the road. On a typical bike indicators are placed just under the line of sight and require to shift the eyes down.

Other applications for the device include cars, helmets for dangerous works, interactive devices for art galleries and auctions.

## Product justification

According to Motorcycle Industry Council in the second quarter of 2006 motorcycle and scooter sales experienced a robust growth of 7.7% with 380,436 sold in the US. The fastest growth rates above 20% experienced dual-purpose bikes.

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All existing GPS systems have built in screen and require non-trivial installation. Best of them come with rugged LCD screens able to stand in rainy and snowy conditions and visible in direct sun light. Typical price range for such devices \$500-1000, where \$500 is a low level device which requires anti-shock anchors for normal operations.

Examples of devices GPS and HeadsUp

	<b>Sportvue MC2</b>	<b>Zumo 550</b>	<b>TomTom Rider</b>	<b>Tango</b>
<b>URL</b>	<a href="http://www.sportvue.com/motorcycles/">http://www.sportvue.com/motorcycles/</a>	<a href="http://www.garmin.com/products/zumo/">http://www.garmin.com/products/zumo/</a>	<a href="http://www.tomtom.com/">http://www.tomtom.com/</a>	
<b>Screen size/color</b>	red/orange characters custom + optics (?)	320x240, 3.5", color, high-bright, sunlight readable, touch screen, UV resistant	320x240, 3.5", color, touch screen	Open platform: different options are available, including low cost black&white and high resolution color screens
<b>GPS</b>	no	yes	yes	yes
<b>Wireless</b>	yes	yes	yes	yes
<b>MP3</b>	no	yes	?	yes
<b>Bluetooth</b>	no	yes	yes	yes
<b>RPM</b>	yes	no	no	yes
<b>Gear</b>	yes	no	no	yes
<b>Radar</b>	yes	no	no	yes
<b>Speed</b>	yes	no	no	yes
<b>12V</b>	no	?	yes	yes
<b>Battery life (h)</b>	30	4	5	5
<b>CPU</b>	8051 (?)	ARM 400MHz (?)	ARM 380 MHz	200 - 400 Mhz
<b>Price (USD)</b>	250	1000	50	500

## **Pricing and sales estimation**

The heart of the system will be AKA LM150. We'll need to add small PCB with necessary connectors, nice case and additional chips (GPS, wireless, etc...) yet production cost for 1000 units is going to be below \$200.

Target price for the device is \$500. Production cost for 1000 units is \$200. Estimated 1% of bike owners will buy the product in first three years. For example, in London today there are about 100K motorcycles on road. We can expect sales of 1K devices in London alone. In California there are about 1.5 mil motorcycles on road. 1% of the motorcycles gives about 15K devices sold in the three years.

## **Overview**

The product is a semitransparent LCD screen attached to the inner surface of the motorcycle helmet. Separate module connected with flexible wires to the LCD provides power for the screen and displays information. Information can contain reports of digital/analogues sensors, maps, news feeds, other indications. Other applications for the device include cars, helmets for dangerous works, interactive devices for art galleries and auctions.

## **Requirements**

Different options for the screen contain black and white low resolution screen 320x80 and two higher end color screens. Devices equipped by the low end screen target motorcycle market and cars. Color screens can be used for other applications.

Two options are provided for the control module – rugged version with wired/wireless connection to the LCD and lighter version for in-house use.

Application running in the control module requires 200MHz CPU and high performance OS with display support. Suggested royalty free RTOS are Linux, eCOS, ucLinux.

## **Development stages**

Prototype is a first stage for the product. The GPS enabled device allows to load maps over USB connection (suggested formats for the maps TBD) and supports only low end version of the screen. Additionally four not-connected ADC interfaces are included for connecting analogue sensors, like wipers and gears position.

In the second stage color screen option is added and ready to go sensors can be bought separately for some motorcycle types.

In the third stage wider range of applications can be ran on the device, including Bluetooth connectivity with cell phone, MP3 player, Wi-Fi connectivity, short range radio.

## **Suggested business model**

Company sells hardware as an open platform for the device. Company sells/licenses software as an open

source product under two licenses GPL and commercial license. The idea is to bring as many software developers as possible and create micro-universe of support, code maintenance and marketing. For the devices with WiFi connectivity company provides localized advertisement and subscription services, like maps update pushed via the local WiFi hot spots.