TV Remote Controller Uses RFID to Become Battery-Free

Favite's system can utilize a passive RFID tag to control the operation of a television, DVD player or other electronic device.

By Claire Swedberg

Oct. 15, 2008—Electronic device manufacturer Favite has released a module that will enable a remote control unit to employ passive RFID technology to operate televisions, DVD players and other electronic devices. The module is the result of work conducted by the company's RFID division, which offers RFID inlays, antennas and tags (see Taiwanese Company Unveils EPC Gen 2 Chip With 128-kbit Memory).

Favite demonstrated the remote control device, which the company calls a green product, at the 2008 Taiwan International RFID Applications Show, held on Oct. 7-11 in Taipei (see Taiwan RFID Technology, Applications Showcased at International Exhibit). The controller has been about one year in development, says Favite's VP, Mark Tseng. One television manufacturer in Taiwan has decided to adopt the technology by early next year, he says, and Favite is in discussion with another company—one of the world's three top television manufacturers—to use the platform as well. Tseng predicts a decision regarding whether to use the technology will be made in the next month.

[IMAGE] All television remote control devices require batteries to operate, and most emit infrared signals to the TV, instructing it to perform a specified function, such as changing the channel. Only Sony 's Bravia LCD-screen television comes with an RF remote control—in this instance, one that operates via a ZigBee (IEEE 802.15.4) radio transmitting at a 2.4 GHz signal.

The controller for Nintendo's Wii video-game system utilizes a combination of infrared and 2.4 GHz RF signals (complying with the Bluetooth standard) to operate the game console. The Bravia and Wii controllers, however, require batteries to generate the power needed to transmit the necessary signals from the devices to the TV or game console.

The Favite remote control module comes in three forms—each containing a 433 MHz RFID tag to communicate, via a proprietary air-interface protocol, with a television or other electronic device. One version of the controller is battery-free and uses an RF wake-up signal from the TV (or other device) to power its RFID tag, as well as the controller's keypad and other circuitry.

The second model also is battery-free, but is powered by a capacitor that recharges when the device is placed in a cradle that sits on the television, and that can store sufficient power to run the controller and RFID tag for approximately two weeks. To reduce power consumption, the capacitor-powered controller remains dormant until the user touches a button on its keypad.

For the third option, the RFID-based remote-control module and other circuitry are powered by a small cell battery that is expected to last for 10 years' worth of use. By providing options of using a capacitor or cell battery, Tseng explains, Favite intends to address the concerns of consumers who would prefer not to be exposed to the 2-watt RF wake-up signal required to power the passive RFID module.

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When a user operates the remote control to operate a TV, the data transmitted by the device's RFID tag indicates which of the keypad's buttons was pressed, in addition to the remote control unit's unique ID number. The television can be programmed to receive instructions from the specific controller with that unique tag ID number, or from any RFID-enabled controller. The device's RF signal is transmitted in all directions, and can also penetrate walls, sending instructions to televisions, DVD players or audio equipment in neighboring rooms.

The advantages to television and other entertainment electronics users are two-fold, Tseng says. Unlike infrared-based controllers, an RFID-based version need not be pointed at—or require a relatively clear line of sight with—a TV. What's more, Favite's design eliminates the need for disposable batteries that must be frequently replaced. In addition, the RFID-based controller is thinner than the infrared version.

"The module is available now," Tseng says, noting that by March 2009, the Taiwan TV manufacturer intends to incorporate Favite's RFID module into its own remote controls, and Favite's RFID interrogator into its TV sets.

According to Tseng, Favite also plans to offer its own version of the remote control unit. Favite's model, he says, will be able to accommodate up to 256 buttons and be programmed for either free control mode (to be used by any machine) or limited control (allowing it to speak only to specific electronic devices). The cost for the Favite controller will be about 30 percent higher than for traditional infrared remotes, Tseng estimates.