

# Macau Casinos Use RFID to Authenticates Chips

Two casinos in Macau are using 13.56 MHz phase-jitter modulation technology to discourage fraud related to their gambling chips.

By Claire Swedberg

Dec. 7, 2006—A pair of casinos in Macau have installed an RFID security system to combat chip cheats. Galaxy StarWorld, which opened in October, has installed a phase-jitter modulation (PJM) high-speed RFID system provided by Magellan Technology and Progressive Gaming International (PGI). Their goal is to stamp out casino-chip fraud. Wynn Hotel and Resort also uses the chip-authentication system.

The deployments consist of 13.56 MHz interrogators supplied by Magellan and RFID chips manufactured by Magellan and Infinion Technologies, incorporated into tags embedded into gaming chips by a third-party manufacturer. PGI provided software integration.

A single interrogator can read as many as 500 chips per second, whether stacked (up to 40 high) or spread across a table, as they might be in a roulette or baccarat game. "Each tag randomly picks from eight different channels," says Rolland Steil, PGI's product manager for RFID solutions, "as long as the reader is set up to receive multiple channels." Most other RFID solutions, he says, transmit only over a single channel.

Casinos typically purchase as many as several million chips, in denominations ranging from small amounts to \$10,000 or higher. Unscrupulous gamblers sometimes bring in counterfeit chips, or alter a low-value chip to look like one with a higher value. StarWorld and Wynn casinos in Macau are using the PJM system to ensure that the chips players cash in are, in fact, what they're represented to be.

The companies purchase the chips from one of several manufacturers of chips with embedded RFID tags. The two largest such companies, says Steil, are Gaming Partners International (GPA) and Dolphin, recently acquired by VendingData Corp. The system associates a unique RFID number, encoded in each chip's tag, with that chip's monetary value. Magellan's Multiple Antenna Reader System (MARS) readers are deployed at the "cage," where players purchase and cash in their chips, to protect casinos against this kind of fraud.

At both Wynn and StarWorld, the RFID reader captures the unique identifying number of each RFID-enabled casino chip when the player purchases it, then transmits that number via Ethernet or a USB port to a database managed by PGI. This creates an electronic record showing that a specific chip is in play. When the player cashes in the chip, the interrogator again captures that ID number, verifying that the chip is legitimate and of the value the customer claims it to be. "This give the casino the knowledge that the chip is real," says Steil.

Both Macau casinos are using the RFID system for security at the time of purchase and return. Additionally, StarWorld is also in the process of installing 200 Magellan readers at gaming tables to verify the value of chips while still in play.

RELATED\_ARTICLES According to R.T. (Tim) Frost, executive chairman of Magellan Technology, the use of multiple channels for this solution provides the necessary redundancy to ensure greater accuracy than other

RFID solutions. "Magellan is not satisfied with the 98 percent target attempted by various other RFID technologies," he says. "Magellan provides 100 percent read rates because we are designed for high-speed multiple reads and have the built-in facility to use multiple reply channels when needed. This combination of new and innovative functionality is unique." If one channel is unavailable, the system immediately switches to another. The International Standards Organization (ISO) issued a standard ISO 18000-3 Mode 2 based on Magellan's PJM technology, Frost says. When transmitting data to a tag, a PJM interrogator uses small phase shifts to modulate its RF field.

According to Frost, this solution may also be marketed for other applications, such as item-level commercial RFID tagging. "We are working closely with other companies to develop document and pharmacy applications, for which the technology is also optimally suited," he says.

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