

## CASE STUDY: Golden 1 Center



**Most Connected Indoor Sports and Entertainment Venue in the World**

# Mobile Connectivity is a Slam Dunk at Golden 1 Center

## Overview: JMA Wireless and Sacramento Kings Deliver Promise of Unparalleled Connectivity to Fans



With the opening of the new Golden 1 Center arena in Sacramento, home to the NBA's Sacramento Kings, the Golden State capital is transforming the downtown area into gold with a variety of new restaurants, shops, and hotels. This is because Golden 1 Center not only hosts professional basketball games, but is a world class venue attracting high profile concerts and entertainment to the city with acts like Paul McCartney, Tim McGraw, Bon Jovi and the WWE.

Spread over a four-block radius in the heart of downtown Sacramento, Golden 1 Center includes a 17,600-seat arena, the Kings' practice facilities, administrative offices and an 18,000 square foot sports medicine facility operated by Kaiser Permanente. The Sacramento Kings were committed to reflecting the best of Sacramento



Fans at Golden 1 Center enjoy top entertainment and the best in mobile communications.

throughout their city's new arena, which included the region's agricultural and artistic heritage, commitment to sustainability, and innovative spirit. As a result, Golden 1 Center is the only indoor arena to earn LEED (Leadership in Energy and Environmental Design) Platinum-certification, placing it in the top three percent of sustainable facilities scored by the U.S. Green Building Council. Its innovative design includes several distinctive features. It is the only entirely solar powered arena in the world and saves energy by using outward-facing windows, balconies and massive five story tall aircraft hangar doors that open to welcome the outdoors and regional delta breeze inside.

Most importantly, Sacramento Kings owner and chairman, Vivek Ranadivé, and his team of technology experts designed Golden 1 Center to be the world's most connected indoor sports and entertainment venue. To deliver the best fan experience possible, the team wanted to ensure fans had uninterrupted access to the Internet - and to each other - at speeds faster than the average household connection. In order to support this unprecedented level of mobile connectivity, system integrator, DAS Group Professionals (DGP), turned to JMA Wireless, a global innovator of wireless communications solutions. JMA Wireless' multi-band, multi-carrier TEKODAS (distributed antenna system) was selected to ensure robust cellular connectivity at Golden 1 Center.

## Situation: Wireless Challenges Abound

According to third party research, Golden 1 Center alone will attract 1.6 million new visitors each year, which equates to many mobile phone users who subscribe to a variety of wireless carriers and use different bands. Robust cellular coverage must be available to all visitors and employees no matter the network operator or technology used.

There were a few challenges to ensuring every fan had access to the Internet. First, large sports and entertainment venues, such as Golden 1 Center, are built with tons of concrete and steel, two materials that impede cellular signals to the mobile subscribers using their devices indoors. The Sacramento Kings were also committed to creating the world's first indoor arena to be LEED Platinum-certified and entirely solar powered, which created some surprising connectivity challenges. For example, to work within the LEED framework and be considered a green building, facilities must ensure vast amounts of natural light are filtered through "low-E" (low emissive) glass. Low-E glass has a metalized coating that helps decrease a building's cooling costs by controlling the amount of solar heat that enters it. However, this metallized coating on low-E glass presents another barrier to cellular signals entering the building.

Clogged networks can also be a real issue at large venues. This can be due to densification, which is a term carriers use to describe a highly concentrated area of cell phone users with a high demand for wireless connectivity. During today's large sporting events, terabytes of data are transported in a few short hours thanks to fans tweeting, posting on social media sites, texting or just making phone calls. They want to share their experiences in real time with family and friends.

Providing seamless wireless connectivity from Golden 1 Center to the shops and parking across the plaza was another challenge. People expect cellular communications anywhere, anytime. However, the network elements enabling robust cellular communications must blend into the landscape. An aesthetically pleasing environment is a key element of the ultimate fan experience.

Finally, there must be dedicated wireless coverage to ensure public safety. During an emergency, it is critical that first responders, spectators and employees have access to mobile communications; otherwise, a situation can become out of control and lead to further endangerment.

## Solution: TEKODAS Facilitates an Unmatched Fan Experience

The TEKODAS deployed at Golden 1 Center is helping to fulfill its goal of being the most connected indoor sports and entertainment venue in the world not just today, but for years to come. DGP selected this multi-band, multi-carrier



solution from JMA Wireless to provide coverage and capacity for four cellular networks and to accommodate the 700L, 700H, 850, 800S, 1900, and AWS bands. The future-proof design of the TEKO DAS will support new technologies readily to ensure Golden 1 Center continues to be a technological leader for years to come.

Currently, this modular solution supports thirteen active sectors, but it is anticipated that in the near future it will expand to twenty sectors. Cellular coverage is provided by 136 five-band low power remote units (RUs) mainly located in IDF closets throughout the massive facility. Six RUs are dedicated just to the 700/800 public safety bands while the remaining 130 enable coverage for employees and spectators. Furthermore, the wireless network includes a mixture of 213 directional and omni-directional antennas supporting either 2X2 or 1X2 MIMO (multiple input, multiple output) coverage.

To ensure cellular coverage on the plaza surrounding the venue, remote units were deployed outside. The compact design of the JMA Wireless RUs allowed them to be concealed under metal rock like sculptures, seamlessly blending them into the surrounding environment.

With the TEKO DAS platform, only a single fiber per remote unit was used to connect it to the master unit (MU). Up to six bands can be delivered over each fiber, making it a very cost efficient solution. In addition, all remote units were configured from a single administrative interface at the master unit. Going forward, new firmware can be applied easily to the existing TEKO DAS platform using this same administrative interface. Overall, installation costs are as much as 50 percent less than competitive offerings.



The rock like sculptures conceal the remote units so the environment is still pleasing to fans.

**“When we set out to build Golden 1 Center, we wanted to build a seamless experience for fans that took advantage of the best available technology today and was future-proofed for the technology of tomorrow. The connectivity at Golden 1 Center is simply unparalleled, and that would not be possible without JMA Wireless and DAS.”**

**Ryan Montoya**  
**Chief Technology Officer**  
**Sacramento Kings**



Two remote units are deployed on the catwalk to help ensure powerful cellular coverage is available throughout the arena.

Further savings have been achieved thanks to the future-proof rack mounted master unit. The compact architectural design of the MU helped to minimize the onsite footprint of the system so that valuable property could be used for much needed parking or revenue generating activities.

## Result: Future-Proof Connectivity

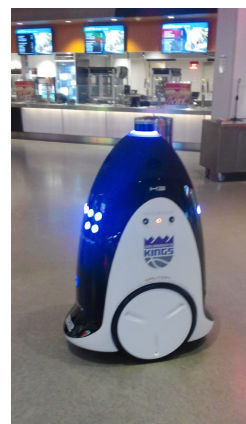
Whether parking in the onsite garage, enjoying a private event in one of the venue's three exclusive clubs, walking across the outdoor plaza or watching a Kings game in the arena, robust mobile communications are being enjoyed thanks to JMA Wireless' TEKODAS. Golden 1 Center's goal of being the most connected indoor sports and entertainment venue has become a reality in part due to this leading-edge platform. As the wireless needs of the arena and surrounding community increase, the future-proof TEKODAS will be there to easily support them.

### About JMA Wireless

JMA Wireless is the leading global innovator in mobile wireless connectivity solutions that ensure infrastructure reliability, streamline service operations, and maximize wireless performance. Employing powerful, patented innovations their solutions portfolio is proven to lower the cost of operations while ensuring lifetime quality levels in equipment and unrivaled performance for coverage and high-speed mobile data. JMA Wireless solutions cover macro infrastructure, outdoor and indoor distributed antenna systems and small cell solutions. JMA Wireless corporate headquarters are located in Liverpool, NY, with manufacturing, R&D, and sales operations in over 20 locations worldwide. For more information, see [jmawireless.com](http://jmawireless.com).

**“ We chose JMA Wireless' TEKODAS for the coverage needs at Golden 1 Center because it provides the coverage, flexibility and reliability required to connect the arena of the future with the data-hungry fans who expect seamless connectivity wherever they go.”**

**Martin Hevezi**  
**Senior Radio Frequency Engineer-DAS**  
**DAS Group Professionals, Inc.**



The technically advanced Golden 1 Center uses a wireless autonomous machine known as the Knightscope K3 to monitor the main concourse of the venue and notify its Mission Control Team of any potential issues.

### About DAS Group Professionals

DAS Group Professionals (DGP) builds the most future-forward distributed antenna systems for sports and entertainment venues across the nation. Its indoor and outdoor DAS demonstrate ingenuity in design, implementation, and profitability for the venue owner while a unique approach to the neutral-host model appeals to carriers as well. DGP's long-term approach to excellence ensures high-performing systems that exceed expectations for everyone – venue owner, carrier and fans -- not just in the present, but at every game and event for seasons to come. Learn more at [dgpdas.com](http://dgpdas.com).



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