

THE DIGITAL BREAKTHROUGH IN
DRIVE-THRU COMMUNICATIONS

HME

Customer Driven

HM Electronics, Inc.
14110 Stowe Drive
Poway, CA 92064
800.848.4468
www.hme.com

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14110 Stowe Drive
Poway, CA 92064
800.848.4468
www.hme.com

"When each order is fast, friendly and correct, it gives... customers one more reason to be happy with their experience, and increases the likelihood they'll return."

—Wendy's magazine

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Executive Summary

Just as digital technology has revolutionized so many other businesses, it is now transforming the drive-thru. Over the past few decades, drive-thru communication systems have evolved from simple cabled intercoms to complex wireless, full-duplex systems to provide operators with better communication. With the introduction of digital communications, quick service restaurant (QSR) operators can benefit significantly from better sound quality and a host of other features made possible by new technology, helping them provide exceptional drive-thru service.

Digital systems have many advantages over analog systems. Digital systems provide significantly better sound clarity for both customers and crew. The difference is similar to comparing CDs with LP recordings. New digital technologies like frequency hopping and encrypted communications prevent unauthorized personnel from eavesdropping and interfering with drive-thru communication. With multi-channel capability, the drive-thru crew can simultaneously communicate with customers while conversing privately among themselves. Other built-in features like voice prompts, auto-hands-free mode, and digital message repeater help automate the drive-thru for faster, more efficient service. These are just a few powerful features of the digital system that have an immediate impact on your bottom line.

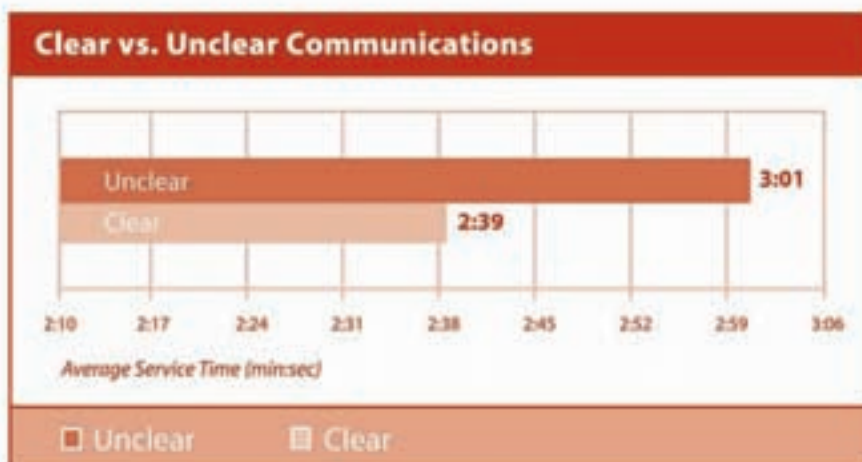
The Impact of Clear Communication

Every experienced QSR operator understands the impact of clear communication on drive-thru service. When the communication between crew and customers is clear, your employees can deliver food more quickly, accurately, and efficiently. In an environment that fosters clear communication, employees can understand customers better and deliver the best possible customer experience. "When each order is fast, friendly and correct, it gives... customers one more reason to be happy with their experience, and increases the likelihood they'll return."

Faster Service and More Accurate Orders

Clear communication improves not only the order accuracy but also the speed of drive-thru service. You can move more cars through the drive-thru by getting each order right the first time. A recent "Drive-Thru Communications Study" conducted by the Global Growth Group (g3) showed that restaurants with clear drive-thru communication deliver food approximately 22 seconds faster than those with

unclear communication.² This is especially important during the busiest times of the day, when the pressure is on both the crew and managers to serve drive-thru customers quickly.



The importance of drive-thru communication has been well documented in numerous trade publications, most recently in *QSR* magazine. In its annual "Drive-Thru Time Study," the magazine ranks America's top 25 restaurant chains based on speed, menuboard appearance, order accuracy and speaker clarity, with speed and accuracy weighted more heavily (each get 40% of the final score) because of their greater importance.³ Since speed and accuracy depend on the type of communication system, it is crucial for operators to have a system that allows them to optimize operations.

The Evolution of Drive-Thru Communication Systems

The earliest form of drive-thru communication system was the cabled intercom, introduced in the 1970s. Although this system provided basic point-to-point communication, its simple design was too limiting for the dynamic drive-thru environment. When HME introduced the wireless communication system designed specifically for the drive-thru application in 1982, most operators made the switch from cabled to wireless for better communication and more efficient use of employees' time. Since that time, many significant technological advances — full-duplex operation, noise-cancellation, hands-free operation, and now digital communications — have provided restaurant operators the capabilities to better operate their drive-thrus.

Restaurants with clear drive-thru communication deliver food approximately 22 seconds faster than those with unclear communication.

—2002 Global Growth Group Drive-Thru Communications Study

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By using a combination of new digital techniques to reduce noise and distortion, digital communication systems can deliver significantly clearer audio than analog systems.

Digital vs. Analog

The evolution of drive-thru communication systems — from cabled to analog to digital — is analogous to the progression of many electronics technologies in other industries. The transition from vinyl phonograph record to cassette tape to digital CD, for instance, has revolutionized the way music is recorded, enjoyed, and preserved. "Digitally encoded discs have greatly improved the quality of recorded music." The digital technologies involved in the development of the CD and CD player have dramatically improved our experience with music and other types of information.

When vinyl records were popular decades ago, "the sound signal captured on a phonograph record was subject to noise and distortion...Clicks and pops from surface noise were a routine annoyance...Digital audio is read from the surface of the disc with a laser beam of light. Since there is no mechanical contact with the surface of the disc, there is none of the wear and tear that occurred with phonograph records." Just as digital technologies have improved our experiences with sound in other industries, they are now transforming the sound quality of drive-thru communication and expanding the capabilities of a wireless communication system.

The performance of your drive-thru system depends on its ability to electronically reproduce and transmit the human voice. In your current analog system, the human voice is converted to electronic signals of varying frequency or amplitude, then conveyed by carrier waves of a given frequency. As these electronic signals go through the analog communication system, they pick up noise and distortion, internally from the circuits and externally from other sources, such as an automobile engine. As a result, the received audio heard by both customer and employee is noisy and distorted.

Digital systems, on the other hand, provide a much more efficient way to reproduce and transmit all kinds of data, including the human voice, similar to a CD recording. Digital systems generate, store, and process data in terms of two states: on (1) and off (0). The transmitted data, expressed as a string of 0s and 1s, is more immune to noise and distortion than analog systems. By using a combination of new digital techniques to reduce noise and distortion, digital communication systems can deliver significantly clearer audio than analog systems.

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A Brief History of Drive-Thru Communication Systems

Date	System	Description
1971	Cabled Intercom (Half-Duplex)	These systems provide basic point-to-point communication from a fixed location with a push of a button. Although they are still the most affordable systems available, their features are limited. Due to the lack of mobility, they do not allow crews to multitask. Communication is half-duplex, which means that when a crew member is talking to a customer, he/she cannot simultaneously hear the customer. These systems also suffer from background noise.
1982	Wireless Half-Duplex Analog	HME was the first to introduce the wireless system. An advance over cabled intercoms, these systems allow crew mobility, supporting multitasking. Being half-duplex, they operate like a walkie-talkie. Employees must still push a button to talk and release it to listen, and cannot hear the customer while they are talking. Communication is subject to background noise and static, and may be subject to interference from neighboring electronics devices.
1993	Wireless Full-Duplex Analog	HME was the first to develop the full-duplex system. With numerous designs and significantly more features, wireless full-duplex analog systems provide smoother, more natural two-way communication, similar to a telephone. Several crew members can simultaneously hear the customer order to accelerate fulfilling the order. Some systems may have value-added features such as internal message repeaters and single-point timers.
1997	Wireless with ClearSound Noise-Cancellation Analog	HME developed the digital background noise-reduction technology called ClearSound. Systems with this built-in noise-cancellation technology can digitally remove car engine and other ambient noise from drive-thru communication to improve order accuracy.
October 2003	Wireless IQ Digital	This new system from HME dramatically expands the capabilities of previous systems. It incorporates the latest digital technologies to achieve the best sound quality possible. Drive-thru communication is exceptionally clear, secure, and interference-free. Multiple conversations can take place simultaneously. Additional built-in features like auto-hands-free mode, internal message repeater, and voice prompts elevate the quality of drive-thru operation. Designed for operation in 2.4 GHz, Wireless IQ can be used at any QSR in the world. No license is required in the USA.

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Because digital systems are more powerful, flexible, and reliable, they will, without question, replace the traditional analog communication systems.

The Advantages of Wireless IQ Digital Communications

Digital communication systems such as the Wireless IQ mark the beginning of an exciting new era for drive-thru communication and operation. Because digital systems are more powerful, flexible, and reliable, they will, without question, replace the traditional analog communication systems currently used at most QSRs. "Traditional electronic communication systems that use conventional analog modulation techniques...are rapidly being replaced with more modern digital communication systems which offer several outstanding advantages over traditional analog systems."

Wireless IQ is the digital breakthrough in drive-thru communication. Wireless IQ not only refines the sound quality, it also transforms the way in which a drive-thru is operated — giving operators and their employees the tools to provide exceptional service and remain competitive.

Enhanced Sound Clarity

One of Wireless IQ's most significant enhancements over analog systems is digital sound clarity. This is achieved by using a combination of digital technological innovations to remove the noise and distortion commonly found in analog systems. Wireless IQ's much improved sound quality results from:

- (1) Increased signal-to-noise ratio (SNR);
- (2) Improved frequency response;
- (3) Reduced distortion; and
- (4) Digital noise-cancellation technology integrated into the system.

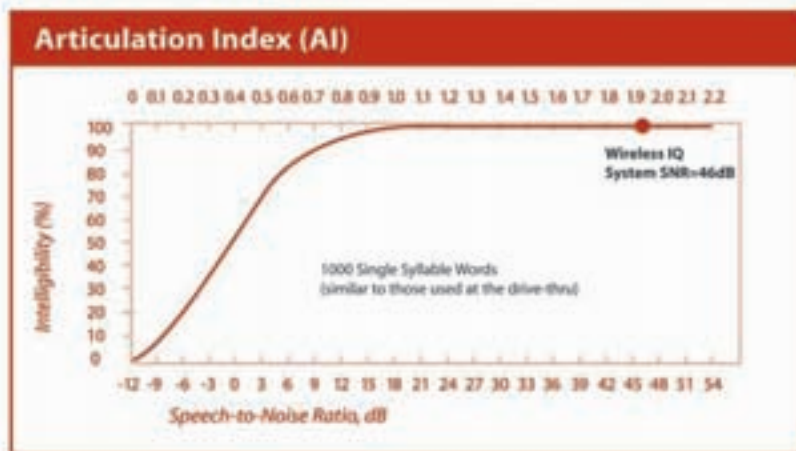
Increased Signal-to-Noise Ratio

Speech clarity is often measured by using the Articulation Index⁷ which illustrates the proportion of speech signal audible to a person, ranging from 0 to 1.0 (with 1.0 as the most intelligible). In a QSR environment that uses mainly single syllable words for menu items, a communication system needs to have a signal-to-noise ratio (SNR) greater than 18dB for maximum intelligibility — for drive-thru orders to be clear and understandable. Wireless IQ surpasses this requirement, with a system SNR of 46dB, which places it in the far right region of the Articulation Index.

This means that Wireless IQ sounds about 26% clearer than the best sounding analog communication system currently on the QSR market.

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Moreover, the high system SNR helps overcome the communication loss caused by high background noise in a typical QSR work area.



To better understand signal-to-noise, imagine talking to another person in an empty room. There isn't any background noise so you can understand each other clearly, and the SNR is a high positive number. Now, add 20 more people to the same room, all talking to each other. You will now find it harder to communicate with another person due to the increased background noise, where the noise is now equal to the level of your conversation (SNR = 0dB) or perhaps greater than the level of your conversation (SNR = -6dB).

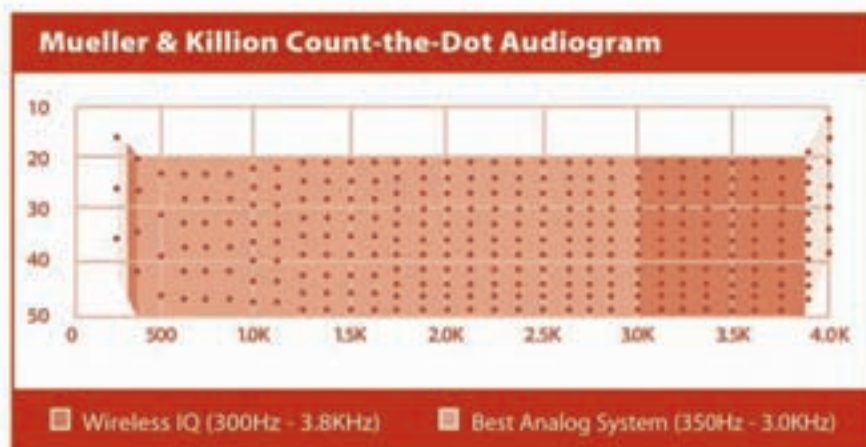
Improved Frequency Response

Frequency response is another sound element that has been improved for clearer drive-thru communication. Frequency response refers to the human capacity to hear sounds in low to high frequencies. The human voice contains frequencies from approximately 100 Hz to over 5 KHz. Some frequency ranges of the human voice contribute to intelligibility more than others. As you can see in the Mueller & Killion Count-the-Dot Audiogram, the frequency band from 1 to 4 KHz is the most important for human hearing. Within this range, people can hear both the highs and lows of speech sounds in order to differentiate words that have similar sounds for optimal intelligibility.

Wireless IQ sounds about 26% clearer than the best sounding analog communication system currently on the QSR market.

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Digital drive-thru communication is clearer, more concise and intelligible than analog systems.



Frequencies with more concentrated dots lead to more intelligibility. It is important for a communication system to have the entire frequency range to make the voice pleasing, natural, and less fatiguing to listen to. With a frequency response range that spans the entire human voice range, from 250 Hz to 4 KHz, **Wireless IQ provides a 22% improved frequency response over analog systems.** Since Wireless IQ allows more of the audio band to be heard, drive-thru communication is clearer, more concise and intelligible than analog systems that have a response range limit of 3 KHz.

Reduced Distortion

Distortion reduction is an important element in providing more intelligible drive-thru communication. Analog communication systems are usually prone to distortion of the audio signal going through the companding process, which requires compressing then decompressing the signal for transmission. Companding is used to reduce noise in analog systems but will also introduce artifacts that distort the signal. Analog systems suffer from distortion because the signal must travel through the circuits in its natural (analog) form.

Digital systems, on the other hand, send the signal through the system as data or numbers. This means that although the individual 1s and 0s of the data can be distorted, they will still be interpreted as the correct number at the other end. Therefore, there is little if any distortion introduced. **With Wireless IQ, the amount of distortion is reduced by 50% or more.**

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Digital Noise-Cancellation Technology

Digital noise-cancellation is an important innovation that further improves communication by removing the external noises at the drive-thru lane. This technology digitally processes all the sounds present at the drive-thru lane and removes ambient noises such as idling engines, exhaust noise and nearby traffic to maximize the clarity of communication. **With digital noise-cancellation technology, the order-taker hears only the customer's voice, freed from the unwanted environmental noises that can muddle drive-thru communication.** Studies have shown that ClearSound noise-cancellation technology can improve order accuracy by 41% and quicken service times by as much as 12 seconds per car.⁹

Secure, Interference-Free Communication

Although most analog systems provide adequate drive-thru communication, they are susceptible to interference from outside sources. In addition, "wireless [analog] systems are very open to eavesdroppers. A private conversation can easily be picked up by anyone with a suitable radio."¹⁰ Just recently, a QSR in Michigan experienced this dilemma first hand when teenage pranksters tapped into the frequency of their wireless system and interrupted drive-thru communication with profanity directed at customers.¹⁰

With digital, you don't have to worry about unauthorized personnel hearing or interfering with your drive-thru communication. Digital frequency hopping spread spectrum (FHSS) techniques and encryption are used to provide secure, private conversations. "Spread spectrum communications grew out of research efforts during World War II to provide secure means of communication in hostile environments."¹¹ FHSS is a transmission technology in which an audio signal is modulated onto a narrowband carrier signal that "hops" in a random but predictable sequence from frequency to frequency as a function of time over a wide band of frequencies, similar to your cellular phone.

Digital systems also encrypt the communication link. This technique secures the transmitted information and prevents unauthorized personnel from accessing or understanding drive-thru communication even if they could follow the frequency hopping signal.

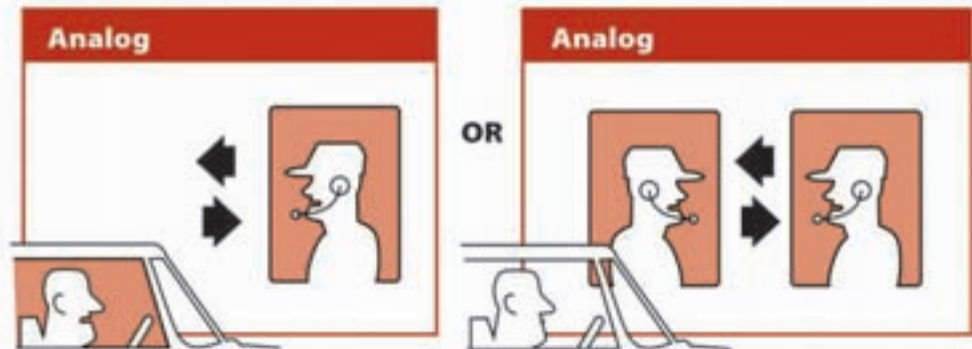
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—Hospitality Technology

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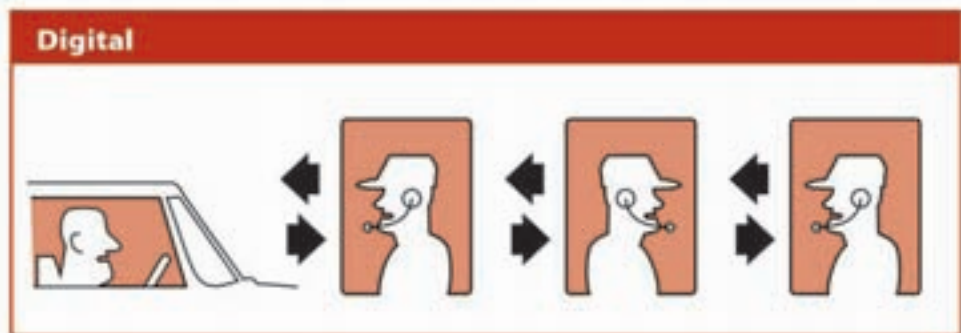
Multi-channel communication means more employees are involved in the entire customer service process and information flows more smoothly.

Multi-Channel Communication



While the order-taker is talking to the customer, crew members cannot communicate among themselves.

With analog systems, drive-thru communication is limited to conversations between the order-taker and customer while other crew members can listen to both sides of the conversation. The crew members may also talk to each other privately on a second channel, but both communication channels cannot occur simultaneously.



While the order-taker talks to the customer, crew members can communicate among themselves on a private channel.

Because of the multi-channel capabilities, Wireless IQ expedites this process by allowing multiple crew members to simultaneously communicate with drive-thru customers and privately with each other. This feature opens a world of future opportunities to use communication systems for expanded applications in QSR operation beyond the drive-thru.

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Multi-channel communication means more employees are involved in the entire customer service process and information flows more smoothly. When the drive-thru crew (order-taker, food prep and delivery employees) hears the order at the same time, they can simultaneously work on the order and ensure its accuracy, thus speeding up the entire drive-thru experience.

Store managers can also use the multi-channel capability to train the drive-thru crew. This hands-free feature lets managers provide private instructions and constructive feedback to their crew, without interrupting communications with drive-thru customers.

License-Free Operation

The Wireless IQ operates in the 2.4 GHz Industrial, Scientific, and Medical (ISM) band, which is approved for use at virtually any location in the world. This eliminates the need to coordinate operation with all of those other wireless systems operating in the crowded 900 MHz or UHF bands. Wireless IQ, a communication system that operates within the license-free 2.4 GHz band, keeps the cost of ownership down since you don't need to pay for licensing fees.

Automated Drive-Thru Service

Wireless IQ comes with the latest technologies to automate drive-thru service, making it easier for employees to expedite orders. Instead of traditional beeps and buzzes, built-in voice synthesized prompts keep employees informed of drive-thru status and system diagnostics. These audible voice prompts make it easy for employees to understand exactly what's going on with their drive-thru equipment, when to replace batteries or which lane they're working on for dual-lane configurations.

The optional "auto-hands-free" mode automatically opens and closes communication as the customer arrives and leaves the order point. This automatic feature eliminates the need for employees to manually activate the communication equipment to initiate a drive-thru order, leaving employees' hands free to multitask and serve customers more efficiently. This reduces the number of tasks employees must remember in order to interact with customers. Automating the ordering process also means faster service for drive-thru customers, especially during peak hours.

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Digital efficiency provides a longer battery life, up to 20 hours with each charge.

The built-in digital message repeater plays up to two different messages. This feature enables crew members to become more efficient while offering a more consistent delivery of drive-thru service. Message repeaters can also be used to offer a menu special (a more cost-effective alternative to advertising) or announce store hours. Message repeaters ensure that an easy-to-understand message is consistently delivered to customers at appropriate times. For employees, the message repeater eliminates the tedious task of repetitiously greeting each customer, improves the speed of service, and provides a consistent greeting delivery.

Improved Reliability

Wireless IQ uses significantly fewer components than analog systems. The fewer the parts required, the more reliable the communication system becomes, since the probability of part failure is significantly reduced. In the next few years, many component parts in analog systems will not be available to repair older systems that are currently on the market.

The smaller size and fewer number of parts enable digital systems to be lighter than analog systems. The lighter belt-pac and headset are more comfortable for employees to wear over a prolonged period of time, easing the fatigue that some employees experience wearing heavier equipment.

Better technology has also contributed to more efficient use of electronics, providing a longer battery life, up to 20 hours with each charge. The Wireless IQ belt-pac uses Lithium-Ion rechargeable batteries for longer operation and lower long-term cost.

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Are you still serving today's customers with yesterday's technologies?

Your current communication system may still be working. Your employees can get through the day using what you have. How can your restaurant justify upgrading to a digital system like Wireless IQ?

Faster, more accurate drive-thru orders

Wireless IQ transforms your drive-thru from day one. Digital sound clarity assures faster, more accurate orders. Frequency hopping and encryption provide secure communications and prevent unauthorized interference. With multi-channel capability, your crew can simultaneously communicate with customers while conversing privately among themselves. Add it all up and Wireless IQ means better service, greater efficiency and more cars moving through your drive-thru when it counts the most.

Reduce downtime and repair expenses

Using an outdated communication system may be a short-term solution, but can be very costly in the long run. Not only will you waste money on continual repairs, but the quality of your service also suffers. Downtime means fewer headsets are in use and wasted time for managers dealing with repairs. Poor communication leads to poor service and frustrated customers and employees. Employees will be irritated and fatigued by poor sound quality and high levels of noise that lead to lower productivity. The cost of slow service and losing customers due to poor communication can have a dramatic impact on your bottom line. A single customer lost at lunch and dinner peak periods per day can cost your restaurant \$3700 in a year. "Quick-serves that do not embrace technology are missing both revenue-boosting and cost-cutting opportunities that could put them at a competitive [advantage]."¹²

Enhanced communication for better drive-thru service

With about 65% of your customers coming from drive-thru sales, it's essential that you remain competitive. Exceptional drive-thru service is required to attract and keep your customers. To provide this kind of service, you'll need a communication system that can empower your employees to better serve customers at every point of the drive-thru. With multi-channel communication, your entire crew can serve customers more quickly, accurately, and efficiently.

"Quick-serves that do not embrace technology are missing both revenue-boosting and cost-cutting opportunities that could put them at a competitive [advantage]."

OSR magazine

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Conclusion

Digital communications can transform your drive-thru into a more efficient and profitable operation. QSR operators benefit significantly from better sound quality and a host of other features made possible by new digital technology, helping them provide exceptional drive-thru service. Clearer communication improves not only the order accuracy but also the speed of drive-thru service. When the communication between crew and customers is clear, your employees can deliver food more quickly, accurately, and efficiently.

Now you finally have a compelling reason to upgrade your present analog system. Just as digital technology has revolutionized the music industry, Wireless IQ can transform your drive-thru communication. By upgrading to digital, you will experience significantly better sound quality, help your employees serve customers more efficiently, increase the speed of service, improve the customer experience, and optimize your drive-thru operation.

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About HME

HME was the first to introduce the wireless headset system concept to the QSR industry. We have the most systems installed worldwide. Wireless communications for QSRs is HME's core business. Hence we are the only manufacturer that provides total solutions for your drive-thru, including wireless and cabled communications, timers, surveillance systems, service and support.

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HM Electronics, Inc.

14110 Stowe Drive

Poway, CA 92064

USA

www.hme.com

Tel: (800) 848.4468

or (858) 535.6060

Fax: (858) 552.0139

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