

Tempest®2400



Tempest2400

Superior Performance and Dependability
For Wireless Communication with No Compromise



Clear-Com®
AN HME COMPANY

The Tempest® Wireless Platform

Wireless communication is an essential part of modern day productions and has become a vital piece of most intercom systems. With fewer resources and larger production areas, crew members need to do more, go farther and be mobile—and do so without missing a beat. Having reliable wireless intercom systems has never been more critical.



Areas of the frequency spectrum that have traditionally been used for wireless intercoms are crowded and more difficult to use. Licensing requirements, radio spectrum reallocation and the wide variety of technologies compete for the same air space.

Uninterrupted and Interference-Free Communication: Tempest is one of the most robust and reliable wireless intercom systems. Tempest intercoms remain unaffected by interference from other wireless systems and devices to consistently provide clear communications to users.

Ease of Configuration and Use: Tempest requires virtually no user RF knowledge or intervention, making setup and user operation simple and fast. T-Desk, PC software for real-time system configuration and monitoring, is included. System updates are easily downloadable via Internet and installed via USB port.

Comprehensive Wireless Intercom Options: The Tempest2400 BaseStation offers intuitive operation and menu structure. Systems are available in two- and four-channel versions. The Tempest systems offer a wide range of interconnectivity to two- and four-wire intercom systems and other audio device I/O compatibility. Full-duplex BeltStations provide dual listen and dual talk capability, and are highly-durable and weather-resistant.

High User Capacity in Multiple Modes of Operations: The Tempest platform provides multiple modes of operation to meet users' needs, and allows many more simultaneous users than other wireless intercoms. Five full-duplex communication paths are open in Normal Mode while an unlimited number of BeltStations is achievable in Split or Shared Mode.

Highly Scalable and Expandable: Offering a host of features and technology to ensure that it performs well in virtually all environments, Tempest is designed to make expansion in growing productions easy and effective by connecting multiple BaseStations and interfacing with compatible four-wire or two-wire intercoms.

Proven to Work Even in the Most RF-challenged Environments

Tempest2400's robust and reliable RF technologies make it the ideal wireless intercom system for indoors, outdoors and touring applications. Operating license-free in the 2.4GHz frequency band, the Tempest2400 uses Frequency Hopping Spread Spectrum and 2xTX Transmission Voice Data Redundancy to assure uninterrupted and interference-free communications. No frequency coordination required.



CM-222 (2-ch BaseStation)
CM-244 (4-ch BaseStation as shown here)

TEMPEST2400 BASESTATIONS

Tempest **CM-222** (2-channel) and **CM-244** (4-channel) BaseStations can support up to five wireless BeltStations per BaseStation in full-duplex, simultaneous operation in Normal Mode. A total of 11 stacked Tempest2400 BaseStations and 55 Tempest full-duplex wireless BeltStations can operate in close proximity while maintaining excellent system performance.

Shared and Split Modes are additional modes of operation that provide expanded user capacity and operational flexibility (More details on page 8).



Features available in the Tempest2400 BaseStations:

- Seamless Roaming and iSelect Roaming
- Stage Announce output with available relay
- Remote Mic Kill
- Minimum and maximum volume levels adjustable on a per BeltStation basis
- Wired BeltStation call
- Optional Remote Transceiver up to 1,500 feet from base on standard wiring; distance can be increased with line extender

CM-222 and CM-244 BaseStations are compatible with existing four-wire matrix or two-wire Clear-Com, RTS or AudioCom partyline intercom systems.

Clear LCD display makes setup easy and efficient while providing real time status of active BeltStations.*

Battery monitoring is available at the BaseStation and through the T-Desk software.*

Omni-directional Whip antennas are standard. A Remote Transceiver that can be placed up to 1,500 ft (460 meters) from the BaseStation. The CCT-RT-EX line extender can be used in conjunction with a Tempest Remote Transceiver to extend the maximum distance between a BaseStation and the Remote Transceiver.

*Only available for BeltStations operating in Normal Mode.

CP-222 BeltStations and **CP-242 BeltStations** (both for use with the CM-222 two-channel or CM-244 four-channel BaseStation) provide users with full-duplex communications.

TEMPEST2400 BELTSTATIONS

Comfortable and rugged for the most challenging production environments, the BeltStations are made of a durable, weather-resistant ABS co-polymer blend with a high performance polyurethane overmold.

BeltStations are provided with rechargeable Li-Polymer battery capable of 9+ hours of operation or can be powered by three Standard AA Alkaline batteries.

Back-lit display and menu functions allow settings to be changed at the BeltStation locally as well as from the BaseStation and T-Desk software in Normal Mode.

An independent volume control is on each BeltStation for controlling listen levels.



CP-222 BeltStation (2-channel audio) is capable of true dual talk/listen functionality, allowing each user to simultaneously monitor and/or talk on both channels (A and B).



CP-242 BeltStation (4-channel audio) is capable of true dual talk/listen functionality, allowing each user to simultaneously monitor and/or talk on two of the four channels (A or B and C or D).

Tempest2400 BaseStations and BeltStations
Compatibility Summary:

BASESTATIONS	BELTSTATION MODELS	
	CP-242 (4-ch)	CP-222 (2-ch)
CM-222	X	X
CM-244	X	X

Tempest2400 Seamless Roaming

Available exclusively in the Tempest2400 systems, the Seamless Roaming feature enables Tempest2400 users to move freely from a given coverage area to another, with no manual switching between BaseStations required.

This product breakthrough delivers uninterrupted coverage for large scale productions and allows users to talk on the Tempest2400 across an expansive production space.

Powered by **ZSync™ Technology**, BeltStation users can roam between as many as 16 different BaseStations (coverage areas or zones). BeltStations operate as they normally do while roaming. There is no interruption of audio or control when a BeltStation migrates from one zone to another.

Key Features of Seamless Roaming:

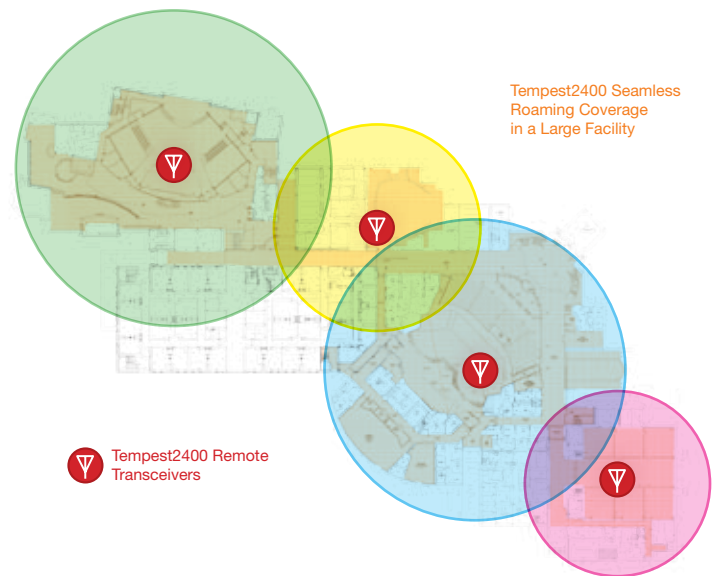
- Roaming group assigned at the BeltStation
- Different users can have different roaming assignments
- Each BeltStation may be configured uniquely for individualized zone configurations

ZSYNC™ TECHNOLOGY

The ZSync Technology provides a zero sync reference that coordinates the hopping patterns of all connected BaseStations every time the system is powered up, irrespective of random time variation in power up sequences, to provide improved system performance and a seamless wireless experience.

VERSION SUPPORT FOR SEAMLESS ROAMING

HARDWARE	Version 1.18 or higher
FIRMWARE	Version 3.0 or higher

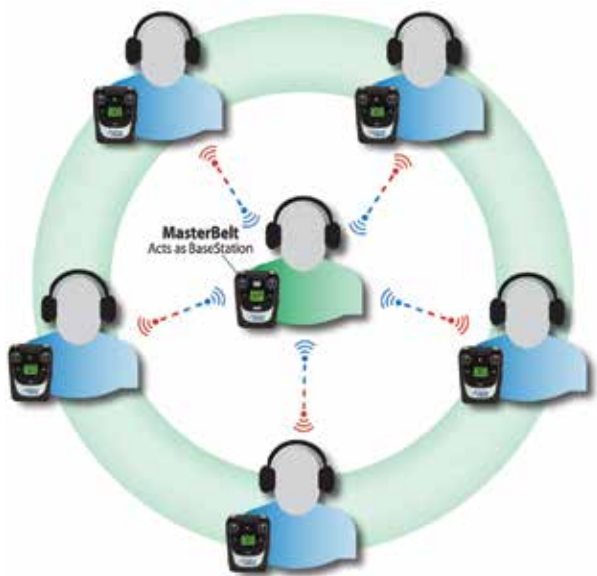


Features in Version 3.0:

- Call on TALK initiates a hardwired CALL(s) to the hardwired intercom when a BeltStation TALK button is pressed
- Program volume control available on each BeltStation
- CALL button as a relay trigger
- 4-channel BeltStations work on 2-channel BaseStations
- Single Listen Mode Option for 4-channel BeltStations

The **Tempest2400 MasterBelt™ (CB-222)** is ideal for mobile productions and offers the advanced features, reliability and robustness of the Tempest2400 rack-mount BaseStation in a compact, portable, and easy-to-deploy package that can be conveniently worn on the hip.

The Tempest2400 MasterBelt provides mobile users the ability to coordinate and communicate hands-free, allowing users to move together within the same work-space. The MasterBelt can be paired with any standard Tempest2400 CP-222 or CP-244 BeltStation to create a full-featured two-channel system in the 2.4GHz band. The MasterBelt also functions as the sixth full-duplex wireless user in the system.



Tempest2400 MasterBelt



Additional highlights about the MasterBelt:

- Operates in 2.4GHz frequency band
- Frequency Hopping Spread Spectrum technology
- 2xTX Transmission Voice Data Redundancy
- Normal, Split and Shared modes of operation available
- Rechargeable Li-Polymer battery and AA Alkaline batteries accepted
- No cabling or A/C power required

Ideal Applications:

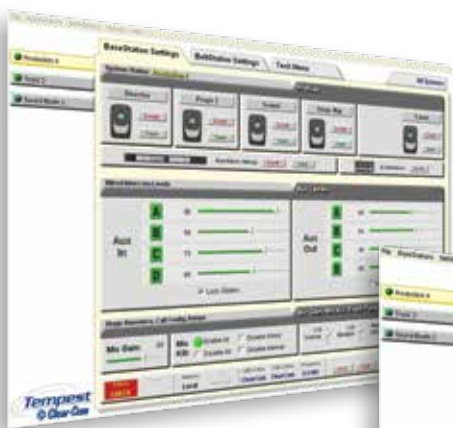
- Tour guides
- Film crews
- Reality television production
- Any application where users need wireless communication and require some group mobility

T-Desk Software (Included with all Tempest systems)

All Tempest Wireless Intercom Systems are supplied with T-Desk, a PC-based desktop application for monitoring and managing Tempest devices. Not only does T-Desk simplify the configuration and management process, but it also provides ultimate flexibility by allowing these functions to be performed from a remote location via a LAN (Local Area Network) connection. T-Desk provides an intuitive, self-evident method of optimizing multiple Tempest BaseStations and their associated BeltStations.

T-DESK BENEFITS

- Real time system monitoring and management
- Load and save BeltStation and BaseStation profiles
- Visually friendly and easy to use interface
- 2-wire/4-wire and auxiliary level control
- Mic Kill functionality
- Battery alert status
- Remote BeltStation sidetone and microphone adjustment (Normal Mode BeltStations only)



Profiles Screenshot



BaseStation Screenshot



BeltStation Screenshot

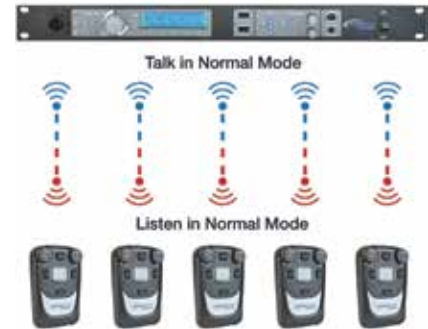
MODES OF OPERATION

Unique to Tempest, all BaseStations offer three modes of operation: Normal, Shared and Split Mode.

NORMAL MODE

In Normal Mode, users can have up to five BeltStations per BaseStation. All BeltStations in this mode are in the standard operating mode giving the users control of the channels on which they operate and dual listen/talk functionality at any given time.

- Each BeltStation has full-duplex capability at all times
- BeltStation talk buttons may be operated in either momentary or latching mode
- Sidetone and microphone gain can be set individually for each BeltStation
- Full BeltStation telemetry is available in real-time at the BaseStation and T-Desk; settings can be adjusted from the BaseStation and/or T-Desk



SHARED MODE

Shared Mode utilizes only BeltStations set as Shared, allowing an unlimited number of BeltStations per BaseStation. Only five Shared BeltStations may talk at any given time; however, all four-channel BeltStations have dual talk and dual listen capability.

All Shared BeltStations:

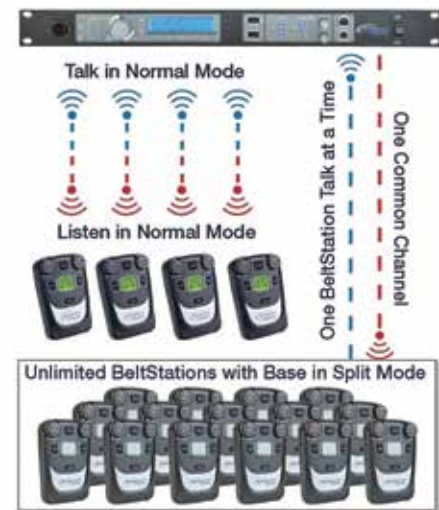
- Can easily be set into Shared Mode instead of Normal Mode from BeltStation menu
- Operate in PTT (Push-to-Talk) only
- Feature Stage Announce, Wireless ISO and Relays
- No Telemetry or remote control from BaseStation and T-Desk



SPLIT MODE

In Split Mode, users are operating in a combination of the other two modes: Normal and Shared Modes. This mode offers the use of four BeltStations (per BaseStation) that utilize the full functionality and allows an unlimited number of Shared BeltStations to operate on the final slot.

- Four full functionality BeltStations operating in Normal Mode
- Unlimited number of Shared BeltStations may be used on a single channel
- BeltStations are inherently full-duplex (talk/listen at the same time)
- Shared BeltStations operate in Push-to-Talk (PTT)
- One user of the common channel can speak at a time. Normal Mode users can be latched
- Telemetry and remote control available from BaseStation or T-Desk for Normal Mode



ACCESSORIES



T-BC5A: Five-Bay Battery Charger

Tempest five-bay battery charger for charging Lithium-Polymer batteries outside of the BeltStation.

*Charger and batteries sold separately.



CCT-DAKIT1: Directional Antenna Kit

9 dBi directional antenna kit:

(2) 9 dBi directional antennas (with mounting brackets),
(1) L-bracket (with (2) 5/8" (15.9mm) dia. mounting posts),
(2) 10ft (4.5m) coax cables, (1) Bogen "C" clamp.

*Not available in EU countries.



ZSync Dongle

The ZSync Dongle provides an External Zero Sync Source for multiple Tempest2400 BaseStations. One ZSync Dongle is required per system to sync all BaseStations in a daisy-chain configuration. Strongly recommended for linking multiple BaseStations.



CCT-RT-EX Line Extender

The line extender is used in conjunction with the Tempest Remote Transceivers to extend distance between the Transceiver and BaseStation. The range will increase by 3,000ft (914m) with one Line Extender or 2,000ft (609m) per Line Extender if using more than one. Up to three can be used.



CCT-RT (2.4GHz)*

CCT-RT: Remote Transceiver

The Tempest Remote Transceiver antenna is powered by Tempest BaseStation via CAT-5 cable, up to 1,500 feet (460 meters).

*Includes 15ft (4.5m) CAT-5 cable and two whip antennas.



T-LP1: Lithium-Polymer Battery

Tempest 3.6VDC, 2000mAh rechargeable Lithium-Polymer battery. The T-LP1 provides up to nine hours of active use.



Parallel Sync Generator

The Parallel Sync Generator provides an External Zero Sync Source for multiple Tempest2400 BaseStations. One Parallel Sync Generator supports up to 12 BaseStations in a star configuration, allowing removal of individual BaseStations without interrupting sync to any other BaseStation. Multiple Parallel Sync Generators may be linked to support larger installations.

TECHNICAL SPECIFICATIONS

TEMPEST2400	
Model	Tempest2400
Frequency Range	2400-2480GHz
Number of Discrete Frequencies	43
Number of Hopping Patterns	43
Number of Co-locatable Bases	11
Dual Antenna Technology	Yes
2xTX Technology	Yes
Propagation Tendencies	Reflects off hard surfaces
Band Adjustment Capability	Yes

SYSTEMS SPECIFICATIONS	
Model	Tempest2400
RF Frequency	2400-2480GHz
Effective Radiated Power	100mW EIRP using 2dBi antenna
Radio Certification	FCC Part 15.247 and ETS 300.328 rules, license free
RF Scheme	FHSS with TDMA
Receiver Sensitivity	-93dBm for 10BER
Transmission Range	Up to 1,000ft (305m); 500 - 900ft (150 - 275m) typical
Audio Frequency Response	300Hz - 3.8KHz with proprietary audio voice shaping

BELTSTATION SPECIFICATIONS		
Model Number	CP-242	CP-222
RF Frequency	2400-2480GHz	
Effective Radiated Power	100mW using 2dBi antenna	
Intercom Audio Channels	4	2
Headset Connector	4-pin male XLR	
Microphone Type	Dynamic or Electret, Auto-Selected	
Antenna	Internal	
Supplied Battery	Lithium-Polymer	
Battery Charging	Via mini USB connector using supplied charger	
Battery Life, Rechargeable Lithium-Polymer	Up to 9+ hours	
Battery Life, Alkaline	Up to 4 hours	
Charge Time, Rechargeable Lithium-Polymer	2 3/4 hours in BeltStation with mini USB charger; 2 1/2 hours in 5 bay charger (from empty)	
Alternative Power	3 standard AA Alkaline cells	
Weight	14.3oz (0.41kg)	
Environmental	-4° – 122°F (-20° – 50°C)	
Dimensions	4.0" (W) x 6.1" (H) x 1.75" (D) (102mm x 156mm x 44.5mm)	
Charger Input	100-240V, 0.3A, 50/60Hz	
Charger Output	5V, 1.25A	

TECHNICAL SPECIFICATIONS

BASESTATION SPECIFICATIONS		
Model Number	CM-244	CM-222
RF Frequency	2400-2480GHz	2400-2480GHz
Intercom Audio Channels	4	2
No. of Antenna Ports per BaseStation	2	1
No. of Synchronized BaseStations	11	
No. of BeltStations (Normal)	5 per BaseStation/55 max	
No. of BeltStations (Shared)	Unlimited	
Antenna Connector Type	RP-TNC	
BaseStation/BeltStation Pairing	3.5mm Mini-jack/cable	
Programming Port	USB	
Stage Announce and GPO Closures	6 relays via DB15	
2-Wire Intercom Interface	4 channels	2 channels
2-Wire Intercom Compatibility	Clear-Com, RTS and Balanced compatible	
4-Wire/Matrix Connection	4 ports via RJ-45	2 ports via RJ-45
Aux Input/Output	1/4" 3-conductor jack nominal -12 to +8dBV, balanced, transformer isolate	
Front Panel Headset	4-pin male XLR	
Microphone Type	Dynamic or Electret, Auto-Selected	
Weight	10.5lb (4.75kg)	
Environmental	-4° – 122°F (-20° – 50°C)	
Dimensions	19" W x 1.75" H x 12" D (483mm x 44mm x 305mm)	
Power	100-240V, 50/60Hz, 11-32V, DC Power	

TEMPEST LINE EXTENDER SPECIFICATIONS	
AC Input Voltage Range	90 – 264 AC
DC Input Voltage Range	22.8 - 25.2 VDC
Input Frequency Range	47 – 63 Hz
AC Input Current	83mA max; 45mA typical
Inrush Current	30A max at 115V; 60A max at 230V
AC Power Consumption	1.5W min; 6.7W max
DC Power Consumption	1.25W min; 5.6W max
Dimensions	3.42 in W x 1.85 in H x 6.22 in D (86.9 mm x 47 mm x 158 mm)
Weight	12.4 oz (0.4 kg)

TEMPEST2400 MASTERBELT SPECIFICATIONS	
RF Frequency	2400-2480GHz
RF Scheme	FHSS with TDMA
Effective Radiated Power	100mW using 2dBi antenna
Receiver Sensitivity	-93 dBm for 10BER 5-
Radio Certification	FCC Part 15.247 and ETS 30.325 rules, license free
Transmission Range	1000ft under ideal conditions (200ft to 400ft typical)
Audio Dynamic Range	>94dB
Audio Frequency Response	300Hz-3.8KHz with proprietary audio voice shaping
System Latency	50m direct
Less than	

TEMPEST2400 MASTERBELT SPECIFICATIONS	
Intercom Audio Channels	2
Simultaneous Listen Paths	True Dual Listen
Headset Connector	4-pin male
Microphone Type	Dynamic or Electret
Antenna	Internal +2 dBi patch
Charger	Input 100-240V, 0.3A, 50-60Hz output 5V, 1.25A
Battery Charging	Via mini USB connector using supplied charger
Battery Life, Rechargeable Lithium-Polymer	Up to 8+ hours
Charge Time for Lithium-Polymer Battery	3 hours
Optional Power	3 standard AA Alkaline cells
Battery Life, Alkaline Batteries	Approximately 4 hours
Dimensions (Inches)	H 6.1" x 4.0" x D 1.75"
Weight (with Lithium-Polymer Battery)	14.3 oz
Operating Environment	-20° to 50° C (-4° to 122° F) → 10% to 90% humidity
RoHS	RoHS compliant



About Clear-Com®

Clear-Com, an HME company, is a global provider in professional voice communications systems since 1968. We develop and market proven intercom technologies such as Analog & Digital Partyline, Digital Matrix, Wireless and Intercom-over-IP systems for critical communication applications in broadcast, performance venues, military, government and enterprise markets. Recognized for our legacy of intercom innovations, production teams around the world have come to depend on Clear-Com for clear, reliable and scalable communications solutions.

About HM Electronics, Inc. (HME)

HM Electronics, Inc. is a diverse group of companies providing solutions that enhance productivity and customer service in markets including restaurants, sports and professional audio. Founded in 1971, we sell, service and support products in 89 countries worldwide, via company-owned offices in the U.S., Canada, Europe, and China, and an extensive network of HME-authorized distributors, dealers and service agents. Every day quick service restaurants take over 24 million orders using HME systems. With the recent acquisition of Clear-Com, HME is the world's leading provider of professional intercom systems.

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