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Design Guide KI-2198B

# Timekeeping System Design Guide



**Rauland-Borg Corporation**

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# Table of Contents

- 1: GENERAL DESCRIPTION ..... 4**
  - REVISION HISTORY ..... 4
  - SCOPE OF THIS DOCUMENT ..... 5
  - CUSTOMER CONNECTION/EXTRANET ..... 5
  - RELATED DOCUMENTS ..... 6
  
- 2: COMPONENT SUMMARY ..... 7**
  - WIRED ATOMIC SYNCHRONIZATION AND MASTER CLOCK COMPONENTS ..... 8
  - WIRED ANALOG SECONDARY CLOCKS ..... 8
  - WIRED DIGITAL SECONDARY CLOCKS ..... 9
  - WIRED SECONDARY CLOCK ACCESSORIES ..... 10
  - POWER SUPPLIES AND ACCESSORIES ..... 13
  - WIRELESS HEADEND EQUIPMENT ..... 14
  - WIRELESS CLOCK LICENSES ..... 15
  - WIRELESS ANALOG SECONDARY CLOCKS ..... 15
  - WIRELESS DIGITAL SECONDARY CLOCKS ..... 16
  - WIRELESS SECONDARY CLOCK ACCESSORIES ..... 17
  
- APPENDIX A ..... 19**
  - POWER REQUIREMENTS (2515 POWER SUPPLY) ..... 19
  - TCCKANEN COMPATIBILITY ..... 20

# 1: General Description

# 1

Rauland Timekeeping System components provide an atomic synchronized, maintenance-free, wired or wireless, timekeeping solution. Rauland Timekeeping Systems include all hardware required for a reliable, complete clock system with reduced wiring requirements and wireless options to simplify installation.

All Rauland Timekeeping System components and accessories are engineered to keep installation costs and time to a minimum and—with the exception of wired digital clocks—are backed by an industry-best five (5) year warranty. In addition, they also:

- ✓ *Wired clocks never require battery replacement*
- ✓ *Recover quickly after power failure*
- ✓ *Offer versatile connection options for complete clock systems or single-unit replacements*
- ✓ *Operate with other manufacturers' wired clock hardware*
- ✓ *Sense correction codes and automatically adjust the displayed time accordingly (“Smart” wired analog clocks)*

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## Revision History



This is the second release of this document. If later editions are issued, changes and additions will be summarized under this “Revision History” heading.

- ✓ *Revision A included the RCKAN12, TCKKAN16 and TCKK16DKIT*
- ✓ *Revision B includes wireless clocks.*

## Scope of this Document



Read this document if your duties include designing a Timekeeping Solution.

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## Customer Connection/Extranet



You can use Rauland's secure Customer Connection site to find, view, and/or download many support documents—including manuals, drawings, and reports. To request an account, follow the online instructions at: <http://customerconnection.rauland.com>.

## Related Documents



Other, related information (including configuration instructions and application summaries) can be found in the following documents:

- ✓ *Secondary Clock Correction (KI-2168)*
- ✓ *TCAMCS Atomic Clock Synchronization Module Installation & Programming (KI-2167)*
- ✓ *Master Clock Programming & Operations (KI-1733 2524)*
- ✓ *2515 Installation (KI-2158)*
- ✓ *Secondary Clocks & Timers-Applications (KI-1470)*
- ✓ *TCCKANTEST Operations (KI-2179)*
- ✓ *TCCKAN12 Installation and Operation (KI-2183)*
- ✓ *TCCKANEN Analog Clock Enhancer Module (KI-2188)*
- ✓ *TCCKINFM Installation and Operation (KI-2190)*
- ✓ *Wireless Installation Manual (KI-2248)*









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## 2: Component Summary







On the following pages, you will find summary information regarding all Rauland Timekeeping hardware:





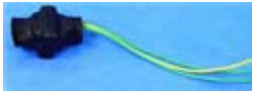
- 1) Wired Atomic Synchronization and Master Clock Components
- 2) Wired Analog Secondary Clocks
- 3) Wired Digital Secondary Clocks
- 4) Wired Secondary Clock Accessories
- 5) Power Supplies and Accessories
- 5) Wireless Headend Components
- 6) Wireless Analog Secondary Clocks
- 7) Wireless Digital Secondary Clocks.
- 8) Wireless Secondary Clock Accessories








Wired Atomic Synchronization and Master Clock Components		
	Model	Description
	<b>2524</b> Master Clock	The 2524 Master Clock is a microprocessor-based unit that: <ul style="list-style-type: none"> <li>• corrects Daylight Saving Time changes automatically</li> <li>• synchronizes virtually any vendors' secondary clocks</li> <li>• corrects up to three (3) different vendors' clocks simultaneously</li> <li>• can be interfaced with a PC for remote programming, diagnostics</li> <li>• programmable with up to eight (8) zones and eight (8) event schedules</li> <li>• equipped with 5 Amp zone output relays</li> <li>• mounts in (2) rack units</li> </ul>
	<b>2525</b> Instruction Panel	The 2525 is a rack-mounted, complementary instruction panel for the 2524 Master Clock. The 2525 provides basic instructions on how to set time and events and select bell schedules and mounts in (2) rack units.
	<b>TCAMCS</b> Atomic Clock Synchronization Module	The TCAMCS is a UL Listed, Atomic Clock to Master Clock Synchronization device, capable of synchronizing all Rauland Master Clocks and Telecenter Systems to the NIST Atomic Clock.  The TCAMCS requires a network connection with Internet access or a local network timeserver (WAN/LAN). The TCAMCS can be rack-mounted in (1) rack unit using the optional TCAMCSRMK Rack Mount Kit.
	<b>TCAMCSRMK</b> TCAMCS Rack Mount Kit	The TCAMCSRMK mounts the TCAMCS into a standard 19" equipment rack. Note: the image to the left shows a TCAMCS mounted in the TCAMCSRMK. Mounts in (1) rack unit.
Wired Analog Secondary Clocks		
	Model	Description
	<b>RCKAN12</b> 12" Analog Clock with 24-hour Dial	The RCKAN12 is a surface-mount, 24-hour dial, 12" analog secondary clock designed for hospital applications. The maintenance free RCKAN12 carries an industry-best five (5) year warranty. With the simple addition of a TCCKANEN Enhancer Module, the RCKAN12 can receive power and correction signals from intercom/paging speaker wires.  The RCKAN12 can be powered by 12 or 24 VDC or 24 VAC, and has an auto-sense feature for proper correction code when connected to a Master Clock.
	<b>TCCKAN12</b> 12" Analog Clock	The surface-mount TCCKAN12 is a maintenance free, 12", analog secondary clock. The TCCKAN12 has an industry-best 5 year warranty and can be equipped with a TCCKANEN Enhancer Module to allow power and correction signals from intercom/paging speaker wires.  The TCCKAN12 can be powered by 12 or 24 VDC or 24 VAC and can automatically sense the correction code sent by a Master Clock.
	<b>TCCKAN16</b> 16" Analog Clock	The surface-mount TCCKAN16 is a maintenance free, 16", high-reliability, analog secondary clock. The TCCKAN16 also has an industry-best five (5) year warranty. The TCCKAN16 can receive power and correction signals from associated intercom/paging speaker wires with the simple addition of a TCCKANEN Enhancer Module.










Wired Digital Secondary Clocks		
	Model	Description
	<b>CLK2420</b> Digital Clock with 8" Speaker Assembly	The CLK2420 is a slanted, steel enclosure that houses a 2420 digital clock and a USO188 8" speaker. The CLK2420 is for surface mount applications and does not require a backbox.
	<b>CLK2520</b> 2.5" Digital Clock with 8" Speaker Assembly	The CLK2520 is a slanted, steel enclosure that houses a 2.5", 2520 digital clock and a USO188 8" speaker. The CLK2520 is for surface-mount applications and does not require a backbox.
	<b>2420</b> 1.8" Character Digital Clock Module	The 2420 clock module (no enclosure) is a four digit (1.8" character height) seven (7) segment LED time display. It includes a built-in count-up or count-down timer function when used with the 2423(G) switch kit. The 2420 clock operates on 24 VAC or 120 VAC power and consumes 300mA (at 24 VAC).
	<b>2421</b> 1.8" Character Flush-mount Digital Clock	The 2421 flush-mount clock includes a 2420 clock module and a flush-mount enclosure. The 2421 is designed to mount on a standard 5-gang electrical box and shares the same electrical characteristics as the 2420 clock module.
	<b>2422</b> 1.8" Character Surface-mount Digital Clock	The 2422 surface-mount clock includes a 2420 clock module and a surface-mount enclosure. The 2422 is designed to mount over either a single or double-gang standard electrical box. The 2422 has the same electrical characteristics as the 2420 clock module.
	<b>2520</b> 2.5" Character Digital Clock Module	The 2520 clock module (no enclosure) includes a four digit (2.5" character height) seven (7) segment LED time display. It includes a built-in count-up or count-down timer function when used with the 2423(G) switch kit. The 2520 clock operates on 24 VAC, 120 VAC or 12 VDC power and consumes 500mA (at 24 VAC) of current.  The 2520 requires an associated 2515 power supply, a direct 120 VAC power connection, or an external 12 VDC power supply.
	<b>2521</b> 2.5" Character Flush-mount Digital Clock	The 2521 flush-mount clock includes a 2520 clock module and a flush-mount enclosure. The 2521 is designed to mount on a standard 5-gang electrical box and shares the same electrical characteristics as the 2520 clock module.
	<b>2522</b> 2.5" Character Surface-mount Digital Clock	The 2522 surface-mount clock includes a 2520 clock module and a surface-mount enclosure. The 2522 is designed to mount over either a single- or double-gang standard electrical box.  The 2522 has the same electrical characteristics as the 2520 clock module.






Wired Secondary Clock Accessories		
	Model	Description
	<b>2423 and 2423G</b> Digital Clock Switch Kit	The 2423 (beige) and 2423G (cool gray) Digital Clock Switch Kits allow the 2420 Series, 2520 Series and wireless digital clocks to be used as count-up or count-down timers. The 2423(G) has two push button switches to control the functions of the digital clock. It is designed to be mounted on a single-gang electrical box.
	<b>2434</b> Dual Mounting Kit (clocks not included)	The 2434 allows a double-face mounting of the 2422 surface-mount clocks (sold separately). The 2434 can be installed with the base of the unit horizontal (for ceiling mounting) or vertical (for wall mounting).
	<b>2534</b> Dual Mounting Kit (clocks not included)	The 2534 allows a double-face mounting of the 2522 surface-mount clocks (sold separately). The 2534 can be installed with the base of the unit horizontal (for ceiling mounting) or vertical (for wall mounting).
	<b>ACC1005</b> Digital Clock Speaker Baffle	The ACC1005 is a combination baffle that mounts an 8” speaker and a 2420 digital clock. It is designed for a recessed installation when used with the ACC1105 backbox. All necessary hardware is supplied with the baffle.  Note: the ACC1005 does not include a speaker or digital clock.
	<b>ACC1105</b> Backbox for Clock/Speaker Baffle	The all steel ACC1105 is used to flush-mount the ACC1005 Combo Clock/Speaker assembly and measures 10.75” (L), 10.75” (W), and 3.75” (D). The ACC1105 backbox can also be used to flush-mount the ACCSAC12 combination clock/speaker baffle unit.
	<b>ACC1120</b> Surface-mount Backbox	The all steel, gray ACC1120 allows the ACCSAC12 Combo Clock/Speaker to be surface-mounted and measures 20.2” (H) by 14.3” (W) by 2.8” (D).
	<b>ACC1121</b> Flush-mount Backbox	The all steel, gray ACC1121 allows the ACCSAC12 Combo Clock/Speaker to be flush-mounted and measures 18.5” (H) by 10.75” (W) by 3.75” (D).




	<p><b>ACCSAC12</b> Combo 12” Analog Clock and 8” Speaker Assembly</p>	<p>The ACCSAC12 is a steel baffle mount (with USO188 speaker) for the TCCKAN12, RCKAN12 or Rauland 13” wireless clock (clock sold separately). The unit comes pre-assembled and can be either surface-mounted (using the ACC1120 backbox) or flush-mounted (using the ACC1121 backbox). In existing installations, the ACCSAC12 can also be attached to the ACC1105 backbox and two (2) wall anchors.</p>
	<p><b>ACCWG12</b> 12” Clock Wire Guard (clock not included)</p>	<p>Protect any 12” clock with the ACCWG12 wire guard. Using heavy, 7AWG steel to protect 12”, wired analog clocks, the ACCWG12 keeps your clocks safe from airborne projectiles. The ACCWG12 wire guard is made for use in gymnasiums, multipurpose areas and anywhere a 12” analog clock may be subject to airborne objects.</p>
	<p><b>ACCWG16</b> 12” Clock Wire Guard (clock not included)</p>	<p>Using heavy, 7AWG steel to protect 16” analog clocks, the ACCWG16 keeps your clocks safe from airborne projectiles. The ACCWG16 wire guard is made for use in gymnasiums, multipurpose areas and anywhere a 16” analog clock may be subject to flying debris.</p>
	<p><b>ACCWGSPAN</b> 12” Clock Wire Guard (clock/baffle not included)</p>	<p>Using heavy, 7AWG steel to protect the ACCSAC12 combination clock/speaker baffle. Protect the clock/speaker baffle from airborne projectiles. The ACCWG16 wire guard is made for use in gymnasiums, multipurpose areas and anywhere a 16” analog clock may be subject to flying debris.</p>
	<p><b>TCCKANDMKIT</b> Double-face 12” Analog Clock Mounting Kit (clocks not included)</p>	<p>Designed for corridor applications, the TCCKANDMKIT provides a mounting bracket for two TCCKAN12 or RCKAN12 clocks (sold separately) mounted back-to-back. The TCCKANDMKIT is installer-friendly and can be mounted either horizontally or vertically (on walls or ceilings).</p> <p>The TCCKANDMKIT mounts over a standard 1- or 2-gang electrical box. The TCCKANDMKIT does not include any analog clocks.</p>
	<p><b>TCCK16DKIT</b> Double-face 16” Analog Clock Mounting Kit (clocks not included)</p>	<p>Designed for corridor applications, the TCCK16DKIT provides a mounting bracket for two TCCKAN16 clocks (sold separately) mounted back-to-back. The TCCK16DKIT is installer-friendly and can be mounted either horizontally or vertically (on walls or ceilings).</p> <p>The TCCK16DKIT mounts over a standard 1- or 2-gang electrical box. The TCCK16DKIT does not include any analog clocks.</p>

	<p><b>TCCKANEN</b> Analog Clock Enhancer Module</p>	<p>The TCCKANEN analog clock Enhancer Module is a device to activate the Reduced Wiring (using speaker wires for clock power and correction) feature of TCCKAN12/16 and RCKAN12 analog clocks. The TCCKANEN permanently installs on the circuit board of a TCCKAN12/16 or RCKAN12. See the TCCKANEN Compatibility section in the Appendix for Reduced Wiring compatibility and configuration information.</p> <p>The TCCKANEN Enhancer Modules are packaged four (4) units per carton.</p>
	<p><b>TCCKANTEST</b> Analog Clock Test Module</p>	<p>The TCCKANTEST sets the electronic controller built into the TCCKAN12/16 or RCKAN12 clock to match the hands on the clock, which may have shifted during handling. The TCCKANTEST is used to initialize all new Rauland analog clocks before installation. The TCCKANTEST is typically used onsite to set the TCCKAN12/16 or RCKAN12 hands immediately before permanent mounting.</p>
	<p><b>TCCKCB21</b> Telecenter 21 Single Channel Off Bus Cable</p>	<p>Designed for use on single channel (both intercom and paging) Telecenter 21 systems, the TCCKCB21 provides an Off Bus for applications that use the intercom/paging speaker wires for clock power and correction.</p> <p>The TCCKCB21 mounts on a single TC2114 Station Line Card.</p>
	<p><b>TCCKCIND</b> Clock Inductor</p>	<p>When using the Reduced Wiring (using speaker wires for clock power and correction) feature of Rauland wired analog clocks (TCCKAN12/16, RCKAN12), the TCCKCIND is an inductor with a center tap to provide a point of injecting DC voltage for secondary clock power and correction on an intercom/paging system.</p> <p>One TCCKCIND is required for each intercom/paging system (i.e. TCV, ICS) plus one additional TCCKCIND for each paging amplifier that does not have a Center Tap. The TCCKCIND is used in applications where a center tap is not available on the intercom/paging system amplifier(s).</p>
	<p><b>TCCKIND25</b> 25V Clock Inductor</p>	<p>The TCCKIND25 is a 25V inductor for Reduced Wiring (using speaker wires for clock power and correction) clock applications when no speaker center tap is available. The TCCKIND25 provides a Center Tap connection point for a Reduced Wiring clock when it is used in conjunction with horns, other non-typical speakers where there is no accessible center tap on an audio line. One TCCKIND25 is required for each speaker or horn with clock combination and is typically mounted on or near the intercom/paging speaker or horn.</p>





Power Supplies and Accessories		
	Model	Description
	<b>2418</b> Solid State AC Output Relay	The 2418 Solid State AC Relay provides a 10 Amp buffer between the analog clocks and the output of the Master Clock. The 2418 is required in applications where large AC loads must be switched. A typical application is for older style 120 VAC clocks that need switching for a time correction signal.  The 2418 is packaged five (5) units per carton.
	<b>2419</b> Solid State DC Output Buffer Module	The 2419 Solid State DC Buffer module provides an interface to switch large DC loads. The 2419 has a current capacity of 5A, allowing it to be used for most applications that require high-capacity DC switching. The 2419 is typically used for clock power and correction applications where multiple TCCKINFM modules are used.
	<b>2515</b> 24 VAC Power Supply	The U.L. <sup>®</sup> Listed 2515 24 VAC power supply has two (2), output circuits capable of delivering 3.5A each. The 2515 is rated for Class Two devices; therefore it may not require conduit to associated secondary clocks (check local electrical codes).  A 2515 has mounting space for the TCCKINFM Clock Interface Module inside its enclosure. When used with the TCCKINFM, the 2515 can accommodate both digital and analog clocks on the same power supply. See the Power Requirements section in Appendix A to calculate the total load and number of required 2515 power supplies.
	<b>PS1225</b> 12 VDC Power Supply	The PS1225 is a 12 VDC, 2.5A, plug-in style power supply used in analog clock, speaker wire power, and correction applications. The output of the PS1225 is injected onto the intercom/paging speaker wire where it is used by the TCCKAN12/16 and RCKAN12 clocks for power and correction signals. A single PS1225 can power up to (180) analog clocks.
	<b>RAM1</b> Relay Module	Designed for large-scale clock application, the RAM1 module provides buffering and switching capabilities. The RAM1 is typically used in conjunction with the TCCKINFM interface module and multiple 2515 power supplies.
	<b>TCCKINFM</b> Clock Interface Module	The TCCKINFM provides a clock correction interface between the TCAMCS, 2515 power supply, and all Rauland (and most other manufacturers') secondary clocks. The TCCKINFM can be mounted within the 2515 or placed on any flat surface.  When attached to the TCAMCS by a single RJ14 terminated cable (VP1105, supplied with the TCAMCS), the TCCKINFM can be used as part of a Master Clock-less, atomically synchronized timekeeping system. The combination of TCAMCS and TCCKINFM provide clock correction signals for both analog and digital secondary clocks connected to a 2515 power supply.
	<b>WCP24AC1</b> 24 VAC Power Source	The WCP24AC1 is designed for use in 120 VAC clock applications. It has a single 120 VAC to 24 VAC step-down transformer mounted on a steel plate that can be attached to either a single- or dual-gang electrical box. The WCP24AC1 serves as a power source for 24 VAC powered clocks.







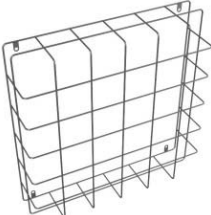
Wireless Headend Equipment		
	Model	Description
	<b>WCXATRAN</b> Wireless Transmitter	5 Watt transmitter for wireless clocks. The WXATRAN uses the 467 MHz frequency for optimal coverage over a large area. Transmitter coverage can be increased by using an external antenna or a repeater (model WCXREPEAT). The WCXATRAN requires either a GPS (model WCXRVRGPS) or NTP (model WCXRVRNTP) receiver.  The WCXATRAN can also synchronize Telecenter Communication Systems. The stylish WCXATRAN can be set on a shelf or rack mounted in (1) rack unit using the optional WCTRRBKT rack mounting kit.
	<b>WCXREPEAT</b> Wireless Repeater	The WCXREPEAT receives a signal from the transmitter and rebroadcasts it to other locations on the same campus. The WCXREPEAT provides extended signal coverage to the WCXATRAN transmitter. The WCXREPEAT is typically used in multi-story building applications. Mounts in (1) rack unit when used with optional WCTRRBKT rack mounting kit.
	<b>WCXRVRGPS</b> GPS Receiver	When used with the WCXATRAN transmitter, the WCXRVRGPS provides atomic time synchronization from Global Positioning Satellites (GPS). The WCXATRAN GPS receiver acquires a signal from a satellite and sends a time sync signal to the WCXATRAN wireless transmitter. The WCXRVRGPS can be mounted outdoors or indoors with a clear view of the sky.
	<b>WCXRVRNTP</b> NTP Receiver	The WCXRVRNTP receiver provides time synchronization to the WCXATRAN by acquiring a signal from an NTP (LAN) timeserver. The WCXRVRNTP can be pointed to any IP address that is running an NTP-based timeserver. The timeserver can be located either on a local network or via the internet. The WCXRVRNTP can be mounted on the same shelf as the WCXATRAN.
	<b>WCXTANTKT</b> External Antenna Kit	The WCXTANTKT is designed for use with all wireless transmitters and repeaters and includes an antenna (not shown), all mounting hardware and lightning arrestors. This kit does not include the low-loss cable required to connect the external antenna to the Transmitter or Repeater. Keep the length of the low-loss cables as short as possible. The WCXTANTKT is typically used in multi-building, campus type environments.
	<b>WCXGPS50EXT</b> Extension Cable for GPS Receiver	The WCXGPS50EXT is an extension cable that provides an additional 50' of length to the WCXRVRGPS receiver unit. Use a maximum of two extension cables for the GPS receiver.
	<b>WCSIGTEST</b> Wireless Signal Tester	The WCSIGTEST provides a means of testing the signal strength of the WCXTRAN transmitter or WCXREPEAT repeater. The WCSIGTEST allows the user to determine if a location is receiving a time-sync signal from the wireless transmitter.
	<b>WCTRRBKT</b> Rack Mounting Brackets	The WCTRRMK rack mounting kit is used for mounting the WCXATRAN or WCXREPEAT in an open (data) rack. This kit includes (2) steel rack mounting ears for the transmitter or repeater. A non-Rauland magnetic base with cable for the transmitter or repeater antenna can be used to set the antenna on the top an enclosed equipment rack. Mounts in (1) rack unit.
	<b>WCTRWS</b> Transmitter or Repeater Wall Shelf	The WCTRWS is a wall mount shelf for the transmitter or repeater. The shelf is finished in a durable black epoxy. This 18" by 10" by 2" unit provides a sturdy mounting location for the WCXATRAN and WCXREPEAT units. The shelf can also hold a WCXRVRNTP receiver if necessary.

Wireless Clock Licenses		
<b>WCLFCCNP10</b>	10-year renewable FCC license for non-profit organizations	
<b>WCLFCCFP10</b>	10-year renewable FCC license for profit organizations	
<b>WCLCANADA</b>	1-year renewable IC (Industry Canada) license for Canada	
Wireless Analog Secondary Clocks		
	Model	Description
	<b>WCA1312AC</b> 13", 24 VAC Wireless Clock	The surface-mount WCA1312AC is a 13", 24 VAC-powered, analog secondary clock. The WCA1312AC has an internal antenna and high efficiency clock movement to minimize power draw. With a shatter resistant, polycarbonate lens and high durability ABS case, the WCA1312AC can provide years of maintenance-free service.  The WCA1312AC also has an industry-best 5 year warranty.
	<b>WCA1312B</b> 13", Battery Powered Wireless Clock	The surface-mount WCA1312B is a 13", high-reliability, analog secondary clock. The WCA1312B is powered by (2) D-cell batteries (not included). The WCA1312B has an internal antenna and high efficiency clock movement to extend battery life. With a shatter resistant, polycarbonate lens and high durability ABS case, the WCA1312B provides a sturdy enclosure that will withstand even the roughest applications.  The WCA1312B also has an industry-best 5 year warranty.
	<b>WCA1324AC</b> 13", 24VAC Wireless Clock with 24-hour Dial	The surface-mount WCA1324AC is a 13", 24 VAC powered, analog secondary clock with a 24-hour dial used in hospital and military applications. The WCA1324AC has an internal antenna and high efficiency clock movement to reduce power consumption. With a shatter resistant, polycarbonate lens and high durability ABS case, the WCA1324AC is a very durable clock that carries an industry-best 5 year warranty.
	<b>WCA1324B</b> 13", Battery Powered Wireless Clock with 24-Hour Dial	The surface-mount WCA1324B is a 13", analog secondary clock with a 24-hour dial used in hospital and military applications. The WCA1324B is powered by (2) D-cell batteries (not included). The WCA1324B has an internal antenna and high efficiency clock movement to extend battery life. With a shatter resistant, polycarbonate lens and high durability ABS case, the WCA1324B is a very durable clock that carries an industry-best 5 year warranty.
	<b>WCA1612AC</b> 16", 24VAC Wireless Clock	The surface-mount WCA1612AC is a 16", 24 VAC powered, high-reliability, analog secondary clock. The WCA1612AC has an internal antenna and high efficiency clock movement to minimize power draw. With a shatter resistant, polycarbonate lens and high durability ABS case, the WCA1612AC is a very durable clock that carries an industry-best 5 year warranty.







	<p><b>WCA1612B</b> 16", Battery Powered Wireless Clock</p>	<p>The surface-mount WCA1612B is a 16", high-reliability, analog secondary clock. The WCA1612B is powered by (2) D-cell batteries (not included). The WCA1612B has an internal antenna and high efficiency clock movement to extend battery life. With a shatter resistant, polycarbonate lens and high durability ABS case, the WCA1612B is a very durable clock that carries an industry-best 5 year warranty.</p>
	<p><b>WCA1624AC</b> 16", 24VAC Wireless Clock with 24-hour Dial</p>	<p>The surface-mount WCA1624AC is a 16", high-reliability, analog secondary clock with a 24-hour dial used in hospital and military applications. The WCA1624AC is powered by 24 VAC. The WCA1624AC has an internal antenna and high efficiency clock movement that reduces power consumption. The WCA1624AC has a shatter resistant, polycarbonate lens and high durability ABS case and carries an industry-best 5 year warranty.</p>
	<p><b>WCA1624B</b> 16", Battery Powered Wireless Clock with 24-hour Dial</p>	<p>The surface-mount WCA1624B is a 16", high-reliability, analog secondary clock with a 24-hour dial used in hospital and military applications. The WCA1624B is powered by (2) D-cell batteries (not included). The WCA1624B has an internal antenna and high efficiency clock movement to extend battery life. With a shatter resistant, polycarbonate lens and high durability ABS case, the WCA1624B is a very durable clock that carries an industry-best 5 year warranty.</p>

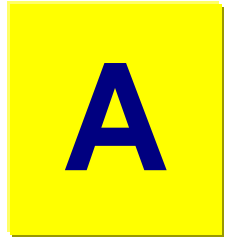
**Wireless Digital Secondary Clocks**

	<b>Model</b>	<b>Description</b>
	<p><b>WCD254R</b> 2.5" 4-Digit Red LED</p>	<p>The WCD254R is a 4-digit digital clock with 2.5", red LED characters that are visible from over 100'. The WCD254R is powered by 24VAC. The WCD254R has count-up and count-down timers as well as Code Blue integration. This wireless digital clock can also function as a class change countdown timer. The WCD254R also has an industry-best 5 year warranty.</p>
	<p><b>WCD404R</b> 4" 4-Digit Red LED</p>	<p>The WCD404R is a 4-digit digital clock with 4.0", red LED characters that are visible from over 125'. The WCD404R is powered by 24VAC. The WCD404R has count-up and count-down timers as well as Code Blue integration. This wireless digital clock can also function as a class change countdown timer. The WCD404R also has an industry-best 5 year warranty.</p>
	<p><b>WCD254W</b> 2.5" 4-Digit White LED</p>	<p>The WCD254W is a 4-digit digital clock with 2.5", white LED characters that are visible from over 100'. The WCD254W is powered by 24VAC. The WCD254W has count-up and count-down timers as well as Code Blue integration. This wireless digital clock can also function as a class change countdown timer. The WCD254W also has an industry-best 5 year warranty.</p>
	<p><b>WCD404W</b> 4" 4-Digit White LED</p>	<p>The WCD404W is a 4-digit digital clock with 4", white LED characters that are visible from over 125'. The WCD404W is powered by 24VAC. The WCD404W has count-up and count-down timers as well as Code Blue integration. This wireless digital clock can also function as a class change countdown timer. The WCD404W also has an industry-best 5 year warranty.</p>

	<p><b>WCD256W</b> 2.5" 6-Digit White LED</p>	<p>The WCD256W uses 2.5" character, white LED's for an extremely clean design to blend well in hospital environments. Designed for use where display of hours, minutes and seconds in a high visibility display is required. The WCD256W is powered by 24 VAC. It can also function as count-up or elapsed timer with the addition of an optional switch kit. The WCD256W also has an industry-best 5 year warranty.</p>
<p><b>Wireless Secondary Clock Accessories</b></p>		
	<p><b>Model</b></p>	<p><b>Description</b></p>
	<p><b>WCANAHB</b> Analog Clock Hangar Bracket</p>	<p>When hanging the wireless clock on any flat surface, the WCANAHB can be attached to the wall to provide a secure keyhole mount for all Rauland wireless analog clocks. The clock must be pivoted to install or remove it. The WCANAHB mounting holes are 2" apart (center to center).</p>
	<p><b>WCANAHBRF</b> Simplex Replacement Hangar Bracket</p>	<p>The WCANAHBRF is a 1.5" by 1", steel mounting bracket that quickly installs over a Simplex clock location. The WCANAHBRF is a sturdy bracket that greatly reduces installation times when used for Simplex clock replacement applications.</p>
	<p><b>WCAMC2</b> Ceiling Mount, Double-Face Kit for 13" Clocks (clocks not included)</p>	<p>The WCAMC2 is designed to ceiling mount (2) wireless 13" analog clocks, back-to-back. The WCAMC2 is built with a 8" by 5.5", steel base with steel mounting post that can be easily installed on ceilings. The steel mounting base covers a 2-gang or 4-square electrical box. Installed height of the complete double-face, ceiling mount assembly is 18.6".</p>
	<p><b>WCAMW2</b> Wall Mount, Double-Face Kit for 13" Clocks (clocks not included)</p>	<p>The WCAMC2 is designed to wall mount (2) wireless 13" analog clocks. The WCAMC2 is built with a 8" by 5.5", steel base with steel mounting post that can be easily installed on walls. The steel mounting base covers a 2-gang or 4-square electrical box. Installed width of the complete double-face, wall mount assembly is 18.6".</p>
	<p><b>WCANA13WG</b> 13" Clock Wire Guard</p>	<p>The WCANA13WG wire guard is designed to protect your wireless clocks. This sturdy protective wire gaurd keeps airborne objects from damaging your clocks. Typical use includes gymnasiums and multipurpose rooms. The wire gaurd is for use on a single, 13" wireless analog clock.</p>
	<p><b>WCANA16WG</b> 16" Clock Wire Guard</p>	<p>Protect your wireless clocks with the WCANA16WG wire guard. This sturdy protective wire gaurd keeps flying projectiles from damaging your clocks. Typically installed in gymnasiums and multipurpose rooms, the WCANA16WG will provide years of maintenance-free protection. The wire gaurd is for use on a single, 16" wireless analog clock.</p>

**KI-2198B Timekeeping System–Design Guide**

	<p><b>WCD25MC</b> Ceiling Mount Double-face Kit for 2.5" Digitals (clocks not included)</p>	<p>The gloss black WCD25MC is designed to ceiling mount a pair of 2.5" character, 4- or 6-digit, wireless digital clocks. The WCD25MC is constructed with a heavy gauge steel mounting post and a 8" by 5.5" steel base that mounts over a 2-gang or 4-square electrical box. Installed height of the complete double-face, ceiling mount assembly is 10".</p>
	<p><b>WCD25MW</b> Wall Mount Double-face Kit for 2.5" Digitals (clocks not included)</p>	<p>The sleek, gloss black WCD25MW is designed to wall mount a pair of 2.5" character, 4- or 6-digit, wireless digital clocks. The WCD25MW is constructed with a heavy gauge steel mounting post and a 8" by 5.5" steel base that mounts over a 2-gang or 4-square electrical box. Installed width of the complete double-face, wall mount assembly is 22".</p>
	<p><b>WCD40MC</b> Ceiling Mount Double-face Kit for 4" Digitals (clocks not included)</p>	<p>The gloss black WCD40MC is designed to ceiling mount two (2) wireless, 4" character, digital clocks. The WCD40MC is built with a 8" by 5.5" steel base that covers over a 2-gang or 4-square electrical box. Installed height of the complete double-face, ceiling mount assembly is 12.2".</p>
	<p><b>WCD40MW</b> Wall Mount Double-face Kit for 4" Digitals (clocks not included)</p>	<p>The gloss black WCD40MW is designed to wall mount a pair of 4" character, wireless digital clocks. The WCD40MW is built with a 8" by 5.5" steel base that covers over a 2-gang or 4-square electrical box. Installed width of the complete double-face, wall mount assembly is 25.6".</p>
	<p><b>WCDIG25WG</b> Wire Guard for 2.5" Digitals</p>	<p>Protect your wireless clocks with the WCDIG25WG wire guard. This sturdy protective wire gaurd keeps airborne objects from damaging wireless clocks. Typically installed in gymnasiums and multipurpose rooms, the WCDIG25WG provides years of maintenance-free protection. The wire gaurd is for use on a single, 2.5" wireless digital clock.</p>
	<p><b>WCDIG40WG</b> Wire Guard for 4" Digitals</p>	<p>The WCDIG40WG wire guard provides a sturdy protective cover to keep airborne projectiles from damaging 4" digital clocks. Typically installed in gymnasiums and multipurpose rooms, the WCDIG40WG provides years of maintenance-free protection. The wire gaurd is for use on a single, 4" wireless digital clock.</p>



# Appendix A

## Power Requirements (2515 Power Supply)

The 2515 Power Supply provides up to 7.0A of total power to support all AC-powered Rauland secondary digital and analog clocks. To meet U.L.<sup>®</sup> Class Two wiring requirements, the 7.0A is split into two, 3.5A outputs.

To calculate the total number of 2515 power supplies required, simply complete the table below:

Model	Power Draw (Amperes)	Quantity	Sub Total (Power Draw x Quantity)
2420, 2421, 2422, CLK2420	0.300		
2520, 2521, 2522, CLK2520	0.500		
TCCKAN12, TCCKAN16, RCKAN12	0.0254		
WCA1312AC, WCA1324AC, WCA1612AC, WCA1624AC	0.040		
WCD254R, WCD254W, WCA256W, WCD404R, WCD404W	0.150		
<b>Total Power Draw</b>			

Quantity of 2515 Power Supplies = Total Power Draw / 7.0

**Important:** the maximum output on any output of the 2515 power supply is 3.5A. If your power requirements per clock circuit exceed 3.5A, the clock circuit will need to be divided and additional 2515 power supplies may be required.

## TCCKANEN Compatibility

The Reduced Wiring (using speaker wires for clock power and correction) option using the TCCKANEN Enhancer Module with the TCCKAN12, TCCKAN16 and RCKAN12 Analog Secondary Clocks is compatible with most Rauland intercom/paging systems.

The Reduced Wiring option is NOT compatible with:

- ✓ *Telecenter System 21 using the 3-wire Station Line Card (model TC2113)*
- ✓ *Director systems using the Two Wire Adapter (model TW25)*
- ✓ *All Telecenter/Director systems using a Privacy Switch*
- ✓ *The Secureplex AS system*
- ✓ *Telecenter ICS systems using the two conductor Station Line Module (models TCSLMTC or ICSSLMTC)*
- ✓ *Telecenter VI and VoIP Systems that are using the Unified Station Line Module (TC6312). This includes all Remote Gateways other than the TC6000.*