



**Conserving Resources,
Reducing Costs with
Accurate Timekeeping
Solutions**



Adding More Hours to the Day:

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Overview

Today's educational facilities are facing budget cuts, reduced resources, and student enrollments that require administrators to do more with less. This philosophy extends to every aspect of the environment—from the buildings, to operations, to the efficiencies in the way schools are run.

At the same time, schools are being challenged to provide an environment of academic excellence that allows both students and teachers to succeed. In order to accomplish these goals, schools must take a hard look at all existing systems, expenses, and processes to ensure they are delivering maximum efficiency and cost effectiveness.

Schools are also looking to green initiatives to reduce consumption and waste, and leverage alternative energy sources. The responsibility to teach and demonstrate conservation also offers an opportunity to reduce energy costs and wasteful practices. Inefficient systems are being replaced with new alternatives that can cut operating costs while taking advantage of natural, environmentally conscious energy sources.

The Challenge of Synchronization

At the heart of every school is a timekeeping system that facilitates a smooth-running campus by ensuring that clocks, bells, and other timing devices are synchronized and accurate. These systems must control devices in virtually every room, every building on campus to coordinate the many variables that can impact bell schedules and clock synchronization.

When school bells and clock synchronization fail, the quality of education and school efficiencies suffer. Conversely, an accurate timekeeping system can offer quantifiable benefits. For example, a school of 1,000 students can gain 15,000 hours of education time each year by eliminating just 5 minutes per day of wasted time due to an unsynchronized bell scheduling and clock system. That equates to over two extra days per student, annually.



Effective bell and clock management

The consequences of inaccurate, unsynchronized clock and bell scheduling systems include:

- 🍃 **Loss of Educational Hours.** A bell that rings during class time can signal dismissal and cause confusion—disrupting valuable classroom time. In addition, a clock that is a few minutes early can create tardiness in students, requiring out of classroom time to get notes and admission to class.
- 🍃 **Increased Burden on Valuable Staff.** Clocks that must be manually adjusted are a costly proposition for schools and a burden on maintenance staff that must physically move between rooms and across campus to make repairs and adjustments.
- 🍃 **Increased Capital Expenses.** Clocks that are hardwired can be costly to keep running and maintain accuracy. Building moves and additions are a manual, costly process for clocks, which, if hardwired, may mean expensive labor to pull wire and additional master clock equipment.

To also be effective, clock and bell systems must adapt to both planned and unexpected activities—from power outages to alternative bell schedules—without relying on costly manual intervention. Systems must be able to communicate wirelessly through existing walls and campuses in order to stay synchronized, accurate, and flexible. And they should be affordable to operate, conserve natural resources, and reduce the burden on maintenance staff.

What's needed is a flexible solution that will ensure accurate, synchronized time and bells across the entire facility, so that students and staff members are where they need to be, improving school operations, increasing educational hours, and reducing complaints and frustration.

Evaluating wireless clock and bell solutions

There are many types of clock synchronization and bell scheduling solutions—all of which can solve some portion of the problem. From hardwired “master clock” systems, which physically connect each clock to a master clock, to atomic time systems, which use radio frequency to communicate with an atomic clock at the National Institute of Standards Technology (NIST) facility, these systems all have both drawbacks and benefits.

Wireless solutions offer great benefits to schools, both in terms of reducing costs and maintaining accuracy. A wireless solution relies on a centralized transmitter to deliver clock synchronization and bell scheduling information, automating the process of manually adjusting every clock. Wireless systems can be highly accurate and flexible, using a software-based interface to control schedule changes or unexpected situations.

However, not all wireless systems operate in the same way. Different systems use different frequencies to communicate with clocks and bells, campus-wide. Most schools must work with existing structures—many of which are older facilities with buildings that are often spread out, have floors below grade, and contain walls that are difficult to permeate with a wireless signal. It's important to select a system with a signal that offers a good balance of distance and propagation to ensure accuracy and coverage.

That's why every environment must evaluate its unique needs before choosing a solution. Here are some things to consider when choosing an overall solution:

- 🍃 **Installation/Maintenance Time and Costs.** Schools must look at the short-term and long-term cost of installing and maintaining a new bell and clock system. Schools with small maintenance staffs must identify how much time is spent physically visiting each clock and keeping it in-sync. In addition, the costs of electricity for power, battery purchase and disposal, and wiring can be significant—especially when amortized over years of service.
- 🍃 **Integration and Interference.** Since most schools have existing clock and bell systems, it's important to evaluate if the new system can easily integrate with the existing technologies and practices within the school. A school must also take into consideration the system's ability to cover the entire facility, which over time often includes new additions with different construction materials incorporated.
- 🍃 **Accuracy and Reliability.** Every school has different bell and clock requirements—some are managing different schedules across a school, campus or district. Bell schedule accuracy is a critical factor, especially when constant changes must be deployed to accommodate ad hoc schedules and emergency situations. If power is lost or Daylight Saving Time changes impact operation, the entire process flow of people, students, and activities can be affected.



Benefits of the Eco Clock:

- Reduces power consumption and operating costs
- Reduces manual maintenance burden
- Reduces environmental waste

Primex Wireless solutions

Primex Wireless offers synchronized clock and bell scheduling solutions that address accuracy, cost, and efficiency challenges facing schools today. By leveraging wireless technology, Primex solutions are reliable and robust, with clock accuracies of 300 milliseconds or less.

Primex is the only solution that is based on a proprietary 72MHz/GPS wireless system, the most cost-efficient and eco-friendly solution available. By utilizing this particular frequency, the Primex solution operates using a fraction of the power of other systems. In addition, the 72MHz frequency produces a more effective signal that travels longer distances, offers superior building penetration, and provides less potential for signal interference.

Primex 72MHz/GPS solution receives accurate time signals from global positioning satellites, offering the most accurate clock system in the industry. It automatically adjusts for Daylight Saving Time and resets after power outages, eliminating manual updates of clocks.

Primex Eco Clock: Time for a Much-Needed Change

Primex has taken energy conservation to the next level with the introduction of their first “green” clock. The Primex Eco Clock harvests ambient light from indoor fixtures as well as indirect sunlight to power its operation, using 4 photoelectric cells that collect light energy and store it in an integrated and rechargeable battery cell.

In periods of no or low lighting, the intelligent clock stops moving the second hand to conserve energy while continuing to keep accurate time. During extended periods of darkness, such as a long weekend or vacation, the clock pulls from energy stored in its integrated battery storage cells, and in extreme situations it uses a single CR 123 lithium battery if these stores are depleted. Once light is restored, it returns to its original energy source for operation.

The Primex Eco Clock receives signals from any Primex Wireless 72Mhz transmitter and can easily be added to existing installations. The combination of photoelectric cells and battery backup allows maintenance free operation lasting up to twice as long as comparable battery-powered systems.

Summary

Running a cost-effective and efficient educational facility depends on reliable timekeeping that ensures all clocks are synchronized and bells are accurately scheduled. The Primex Wireless Eco Clock is a new approach to conserving natural resources and reducing the burden on maintenance. With Primex, schools can reap the benefits of a timekeeping solution that addresses today’s needs, while providing a platform for new innovations.

