Configuration Guide
MOdel 7000 Master Clock System

This document is intended to assist dealers and users of the Model 7000 to configure a
Master Clock System. More detailed information is provided in the installation manual of each product.

Overview:

The Model 7000 Master Clock & Bell Contol System is an easy to install, low voltage clock system. The 7000 Master
Controller manages both the system clocks and bell schedules.   Any number of Analog or
Digital System Clocks can be connected to the Master Controller with the addition of Clock Boosters. A
limit of 50 clocks can be connected without a Clock Booster. Figure 1 provides an example configuration.

The 7000 Master Controller communicates the correct time to all clocks on the system, maintaining
synchronization. It also manages the bell schedule and either directly drives the bells or drives switch
closures in a multi-circuit bell ringer. The 7000 can directly drive one zone of bells. A Multi-Zone Bell
Ringer is required when more than one zone of bells is necessary.

The 7000 may be set and managed from either the front panel or with computer software. The software
is simple to use and can control all system functions. The Master Controller connects to the computer's
serial port. The computer can be connected anywhere along the clock wiring. See Figure 1.

Quick-connect RJ-45 connectors on all cables link the Master Controller with all System Clocks, Bell
Ringers and the computer, making wiring simple and trouble-free, or Plug and Play. See Figure 1.

The Clock System products are designed to be Panel or Wall mounted.

The Model 7000 Master Clock System consists of:

- A 7000 Master Controller
- Any number of Analog or Digital System Clocks
- Optional Bells and Horns – for direct connected to the Master Controller
- An optional Multi-Zone Bell Ringer – providing 4 zones of Bells and Horns
- An optional Clock Booster – for very long wire runs or large numbers of clocks
- Plug and Play Flat Cables with RJ-45 Connectors
- Computer Software and RS-232 connector

Figure 1:   **Model 7000 Master Clock & 4 Circuit Bell Control System**

Products Details and the included equipment:

Not all products listed are required for every installation.

- **Master Controllers**

  o 7000 Master Controller
  o 7024 – Includes 7000 Master Controller and 5024 4-Zone 24 VDC Bell Ringer
  o 7110 – Includes 7000 Master Controller and 5110 4-Zone 0 – 220 VAC Bell Ringe

    Software and PC **are not** required to configure the 7000 Master Controller
    The Master Controller settings may be entered from the 3 buttons located inside the locked cover
       of the 7000 Master Controller
    The 7000 Master Controller requires a 110 VAC power

    Software and PC **are** required to configure the **Multi-Zone** Bell and Horn settings
    The 5024 and 5110 require a 110 VAC power

  The following is **included** with the above products:

  - Software to Control the 7000 Master Controller from a PC
  - 41400 Serial to Flat Cable Converter
  - 41270 Y Plug and Play Flat Cable
  - 41269 Plug and Play Flat Cable, 50-foot

- **Clock Booster**

  o 7050 Clock Booster

    Clock Booster is required for long runs of over 5000 ft and clock quantities greater than 50
    The Clock Booster may be used to simplify wiring
    The Clock Booster can drive up to 200 clocks
    Multiple Clock Boosters can be daisy chained for unlimited clocks
   The 7050 Clock Booster requires 110 VAC power

  Order the appropriate number of 50-foot or 100-foot cables for your topology when connecting a
  Clock Booster

  - 41269 Plug and Play Flat Cable, 50-foot
  - 41314 Plug and Play Flat Cable, 100-foot

- **System Clocks**

  - **Analog Clocks**
    - o   5200 Analog Clock
    - o   5201 Analog Clock – 24 hour face
    - o   5224 Analog Clock, 24 VDC
    - o   5224 Analog Clock, 24 VDC – 24 hour face
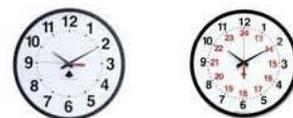
  Analog Clocks are powered by the Model 7000 Master Controller through the Plug and Play Flat Cable

  When used as a replacement clock for Simplex or other 58th or 59th minute Master Controller, the clocks must be connected to power and correction signal through the Molex Connector.

  The 5200 or 5201 will be powered by 110 VAC and receive 110 VAC correction signals
  The 5224 or 5225 will be powered by 24 VDC and receive 24 VDC correction signals

- **Digital Clocks**
  - o   41354G Digital Clock, 2 ½ inch display, white case
  - o   41355G Digital Clock, 2 ½ inch display, black case
  - o   41356G Digital Clock, 4 inch display, white case
  - o   41357G Digital Clock, 4 inch display, black case

  Digital Clocks may be powered through the molex connector or use the included power cord.
  Units are available for use in 24 VDC or 24 VAC systems.

  When used as a replacement clock for Simplex or other 58th or 59th minute Master Controller, the clocks must be connected to power and correction signal through the Molex Connector.

  The 5200 or 5201 will be powered by 110 VAC and receive 110 VAC correction signals
  The 5224 or 5225 will be powered by 24 VDC and receive 24 VDC correction signals

- **Cable Order**

  To connect System Clocks to the Master Controller, order the appropriate cables for your topology. More cable details on page 5.

  - o   41270 Y Plug and Play Flat Cable
  - o   41269 Plug and Play Flat Cable, 50-foot
  - o   41314 Plug and Play Flat Cable, 100-foot
  - o   41313 Flat Cable Coupler

- **Bell Ringers, Bells and Horns**

  o 5024 Bell Ringer
     The 5024 is a 4-Circuit Bell Ringer, 1.5 amps at 24 VDC total for all circuits
     Up to 15 bells can be connected to the Model 5024 Bell Ringer
     The 5024 Bell Ringer requires a 110 VAC power

     Order the following bells to connect to the 5024 Bell Ringer or directly to the 7000 Master
        Controller
     - 41361 Bell – 24 Volt DC, **6 inch** bell   96 dB   0.10 amps
     - 41392 Bell – 24 Volt DC, **8 inch** bell   96 dB   0.10 amps
     - 41449 Bell Cable, 100' Spool
     - 41450 Bell Cable, 250' Spool

  o 5110 Bell Ringer – 0-220 VAC bell ringer circuits – 4 Zones – 10 amps / circuit
     The 5110 is a 4-Zone Bell Ringer, each with a 0-220 VAC 10 amp relay closure
     Up to 50 bells can be connected to the Model 5110 Bell Ringer
     The 5110 Bell Ringer requires a 110 VAC power

     Order the following bells to connect to the 5110 Bell Ringer
     - 41397 Bell – 110 VAC, **6 inch** bell   98 dB   0.025 amps
     - 41398 Bell – 110 VAC, **8 inch** bell   98 dB   0.025 amps
     - 41363 Horn – 110 VAC, **Horn**   78 to 103 dB   0.125 amps

     The following is included with the Bell Ringer products:
     - 41270 Y Plug and Play Flat Cable
     - 41269 50-foot Plug and Play Flat Cable

- **Cables for connecting Master Controllers, System Clocks and Bell Ringers**

  o 41270 Plug and Play Flat Cable, Y cable
    Provides the ability to connect a clock and continue the cable run

  o 41313 Flat Cable Coupler (**not shown**)
    Provides the ability to connect two lengths of Plug and Play Flat Cables

  o 41269 Plug and Play Flat Cable, 50-foot
  o 41314 Plug and Play Flat Cable, 100-foot

- **Computer Connection**

A computer connection allows the user to set the time and bell schedules using software provided with the 7000 Master Controller. To control the Master Controller with a computer, connect the 9 pin to RJ-45 Serial Cable Converter and a 50-foot or 100-foot Plug and Play Flat Cable to a Y Cable at any point in the wiring. See Figure 3. The computer cannot be connected across a 7050 clock booster, it must be connected on the same wire run as the 7000 Master Controller. The bell schedule shown below in Figure 2 provides an example of the software screen that is used to set up the bell schedule.
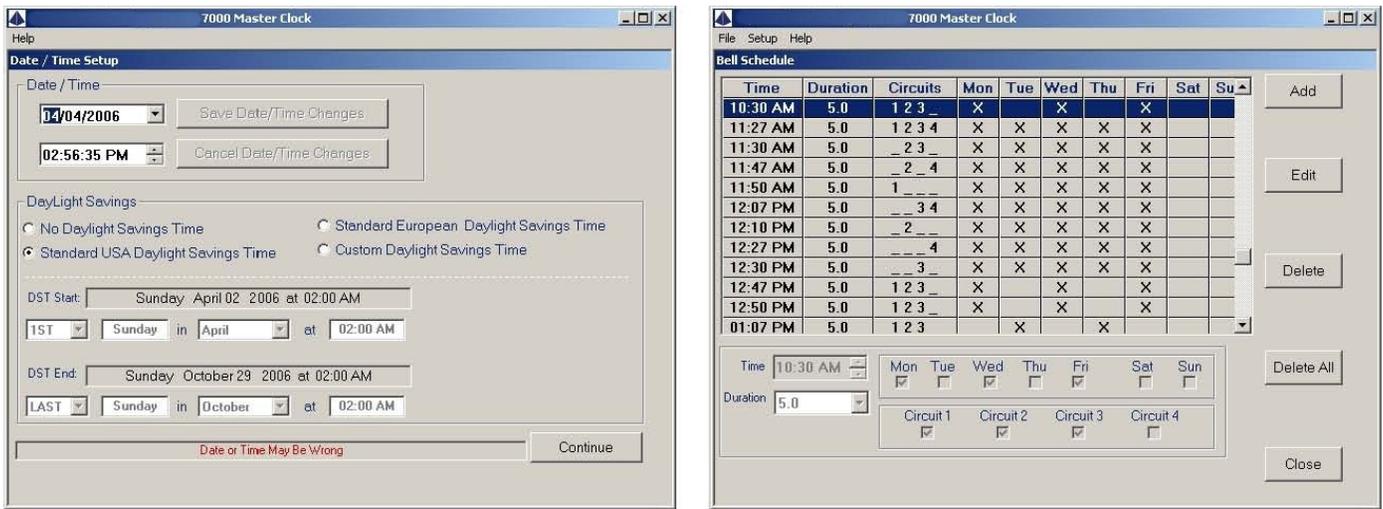

Figure 2:   Example of two Master Controller Software Screens

System Wiring

- **7000 Master Controller**

The Master Controller requires power from an AC outlet

Any of the flat cables, 41270 Y cable, 41269 50ft cable or 41314 100 ft cable, can be plugged into the 7000 Master Controller. See Figure 3 and Figure 4.

If the 7000 Master Controller is at the end of the run, do not use a Y-Cable. Simply plug the 50-foot or 100-foot cable directly into the Master Controller. See Figure 3.

A Y-Cable allows the Master Controller signal to be sent in two directions. See Figure 4.

- **Computer**

To control the Master Controller with a computer, connect the serial cable or USB to Serial Converter Cable to the computer, attach the 9 pin to RJ-45 cable converter and connect a 50-foot or 100-foot cable to a Y Cable at any point in the wiring that is directly connected to the 7000 Master Controller. See Figure 3.

 To use a USB Port from the PC to control a Master Controller, order the following:
   - 41685 USB to Serial Converter Cable (required only for USB connections)

- **7024 or 7110 Master Controller with Multi-Zone Bell Ringer**

The 7024 or 7110 products consist of two items. A 7000 Master Controller and a 5024 or 5110 Multi-zone Bell Ringer. The Master Controller is connected to the Multi-zone Bell Ringer with either a 50-foot or 100-foot version of the Plug and Play Flat Cable. The Multi-Zone Bell Ringer may be connected at any point along the wiring. Figure 3 shows the Bell Ringer at the end of the run, but it can be connected with a Y-Cable at any point in the wire run.

To configure the Master Controller for a Multi-Zone Bell Ringer, a computer will need to be connected to the Master Controller. The panel buttons on the 7000 Master Controller does not provide access to Multi-Zone Configurations.
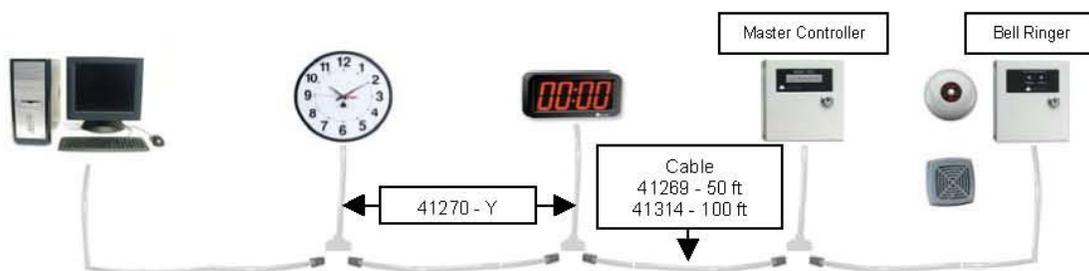

Figure 3:   **Wiring the Clock System with a Computer and Bell Ringer**

7050 Clock Booster

7050 Clock Booster is connected to the Master Controller with a 50-foot or 100-foot Plug and Play Flat cable. The Master Controller signal is connected to the input channel, located closest to the power connector. The 7050 Clock Booster has 8 output channels that can be connected to Clocks and Bell Ringers using the Plug and Play Flat Cables. It does not matter how many devices are connected to each channel, as long as the total devices does not exceed 200. A Clock Booster may be added at any point in the wiring.

- **Digital or Analog Clock**

Any of the flat cables, **41270 Y cable**, **41269 50-ft cable** or **41314 100-ft cable**, can be plugged into any Clock. A Y-Cable allow the cable run to continue in a "daisy chain" fashion to the next clock. Although the connection is not truly a daisy chain, it is easier to visualize the connections when described as "daisy chain" fashion. Figure 4 shows such a connection scheme.

If the clock is at the end of the run, do not use a Y-Cable. Simply plug the 50-foot or 100-foot cable directly into the Clock.

- A Digital Clock requires power from an AC outlet.
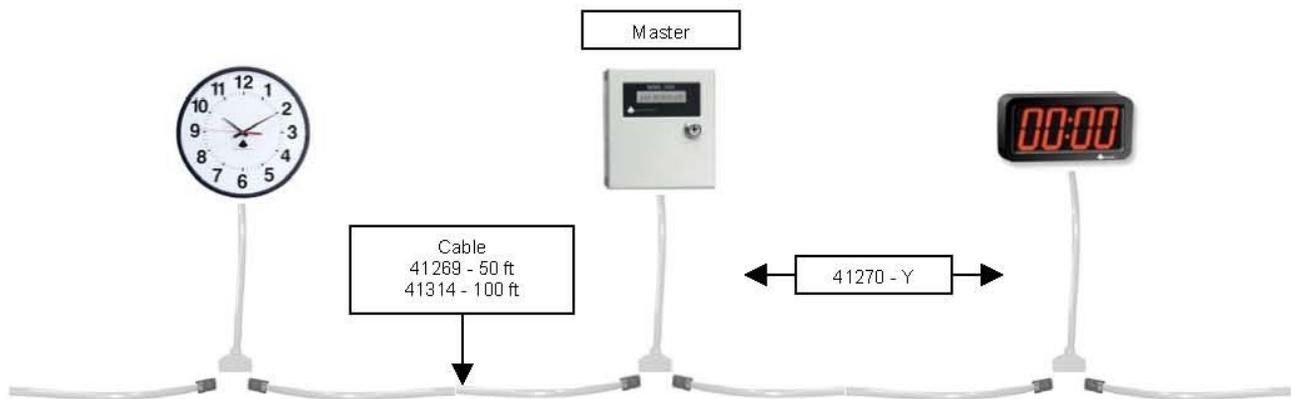- An Analog Clock will get its power from the Master Controller across the Flat Cable

Figure 4:   **Clock Wiring – Continuous Run or Daisy Chain Fashion of wiring**