SMC 3000 Series Master Clock Installation Manual (V2)

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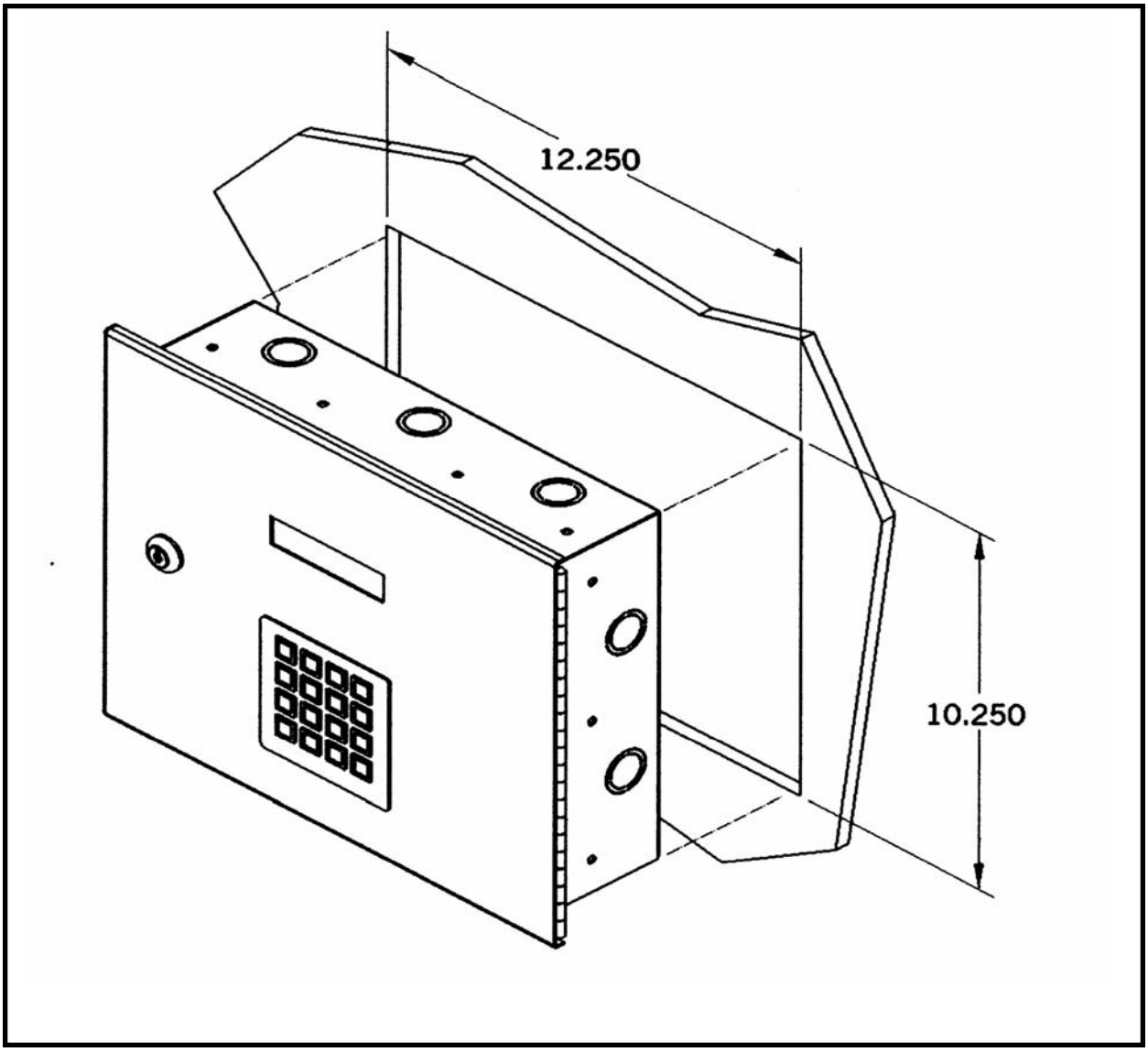
Surface Mounting Diagram



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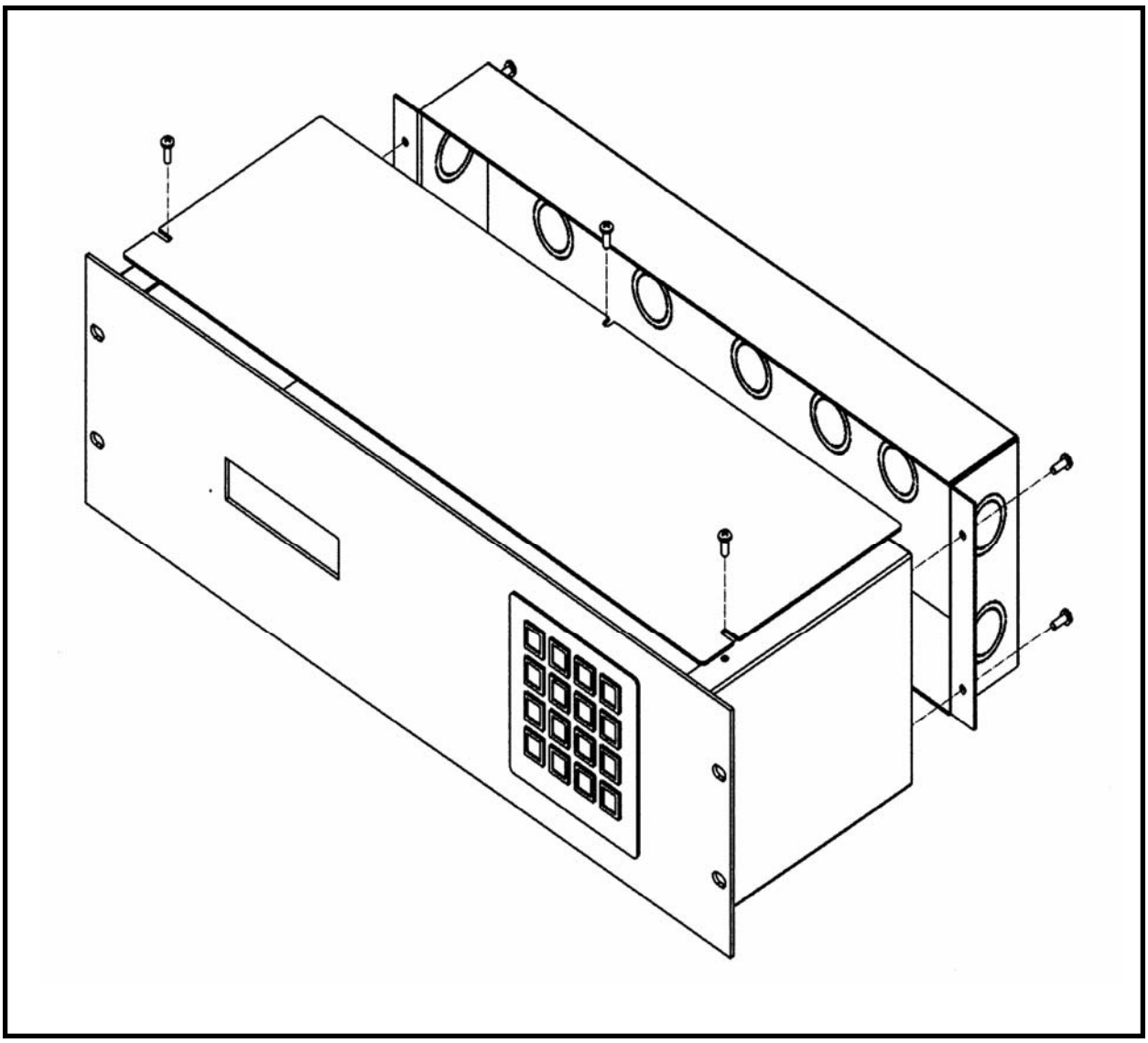
Rack Mounting Diagram



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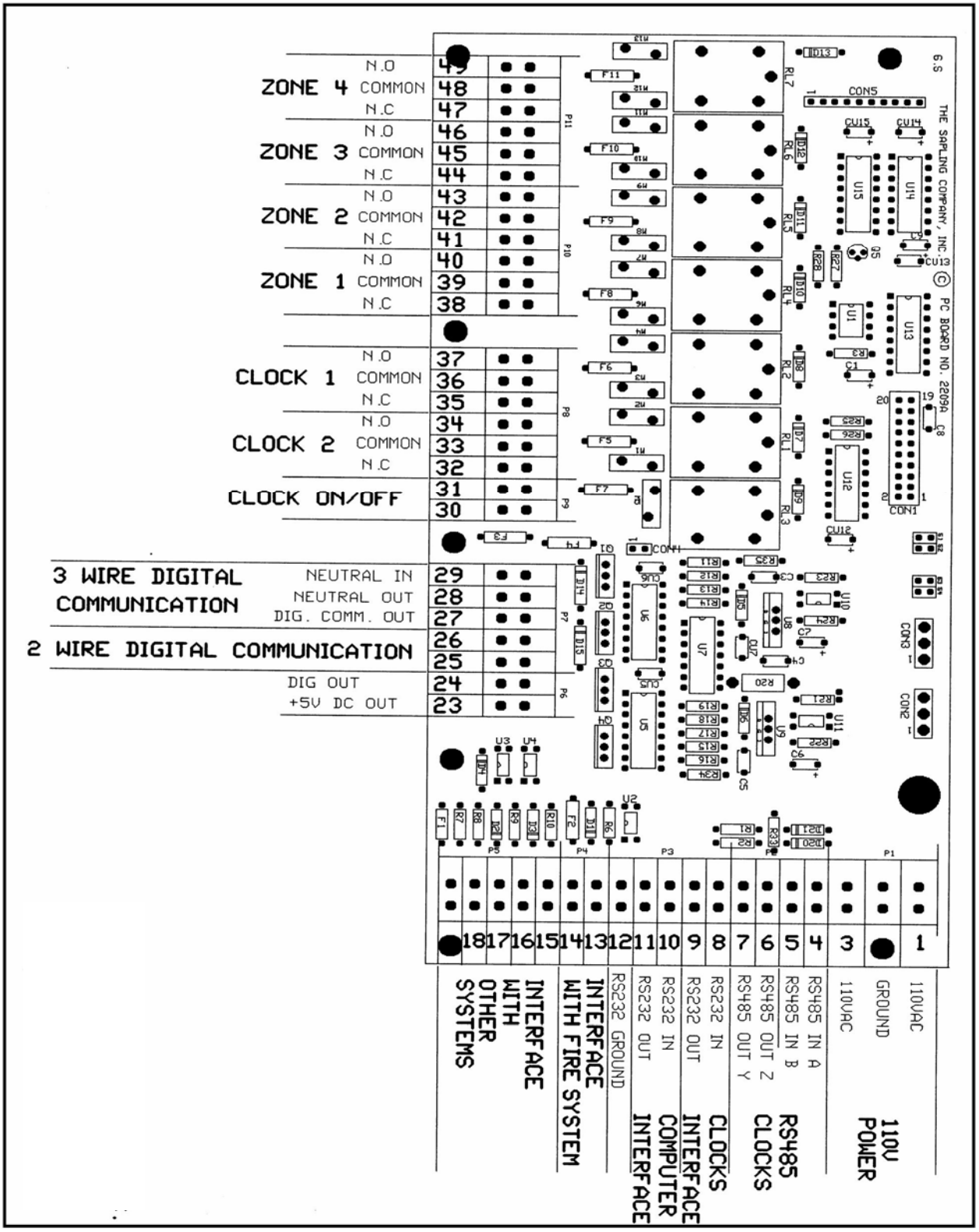
Board Layout



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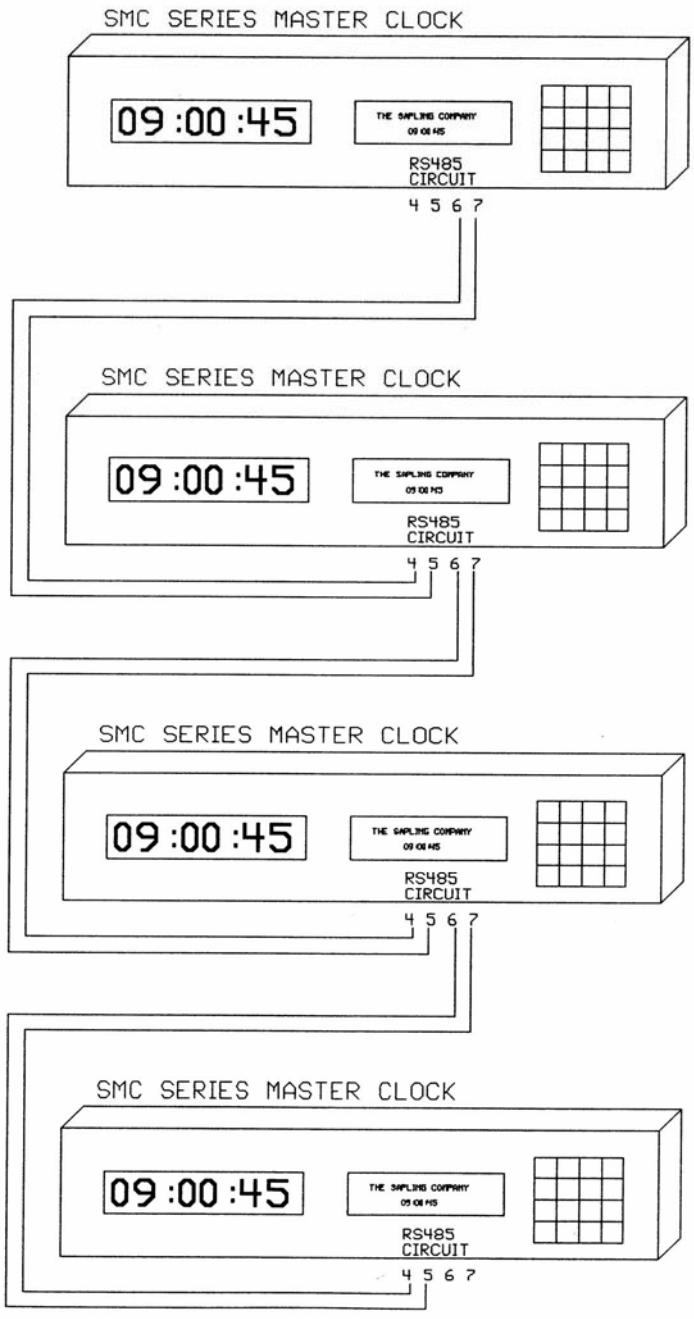
Interfacing Between Master Clocks



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Synchronous Protocol Information

Protocol Type	Correction Code	Hourly Correction Time	Hourly Correction Duration	Daily Correction Time	Daily Correction Duration
59 minute correction Simplex 2310-92XX 57 and 77 series IBM 57, 62, 77, 82 and 87 series Cincinnati D10 and D12 Latham SS12 types Edwards 01 Dukane 24SS series	006	xx:57:54 Will correct the minutes and seconds.	8 seconds	05:57:54 17:57:53 Will correct hours, minutes, and seconds.	14 seconds
Dukane 24030,24023,24050, 24060 and 24010 types National Time & Rauland Rauland Analog 2460 series National 010-NNE-SRAX, 010-NNE-SRAXLV, 023-NNE-SRAX, 023-NNE-SRAXLV, 030-NNE-SRAX, 030-NNE-SRAXLV, 060-12E-SRAX, 060-12E-SRAXLV	001 or 002	xx:00:00 Will correct the minutes and seconds.	25 seconds	06:00:00 18:00:00 Will correct hours, minutes, and seconds.	001 = 25 seconds on, 35 seconds off every minute for 24 minutes. 002 = 24 minute closure from 6:00:25 to 6:24:25 AM & PM
Stromberg E3109 and WS310	003	xx:56:05 Will correct the minutes and seconds.	10 seconds	11:56:00 23:56:00 Will correct hours, minutes, and seconds.	45 seconds
National, 010-NNE-SR, 010-NNE-SRLV 023-NNE-SR, 023-NNE-SRLV 030-NNE-SR 030-NNE-SRLV 060-12E-SR 060-12E-SRLV	020	xx:00:00	25 seconds	N/A	N/A
Dukane 24BF209, 24BF212 707-8 and 707-9 types	005	xx:57:03 Will correct the minutes and seconds. xx:58:05	57 seconds	5:59:03 17:59:03 Will correct for hours, minutes, and seconds.	57 seconds on, 63 seconds off 11 times from 5:59:03 to 6:20:00
58 minute correction Honeywell ST402, 403, 404, 410, 411, 412, 413, 802, 803, 804, 810, 811, 812 & 813 Faraday 1310, 1311, 1320, & 1321 Cincinnati D8 Standard/Faraday 2310 & 2331	007	xx:58:05 Will correct the minutes and seconds.	55 seconds	5:05:00 17:05:00	65 seconds on, 25 seconds off 12 times from 5:05:00 to 5:22:35

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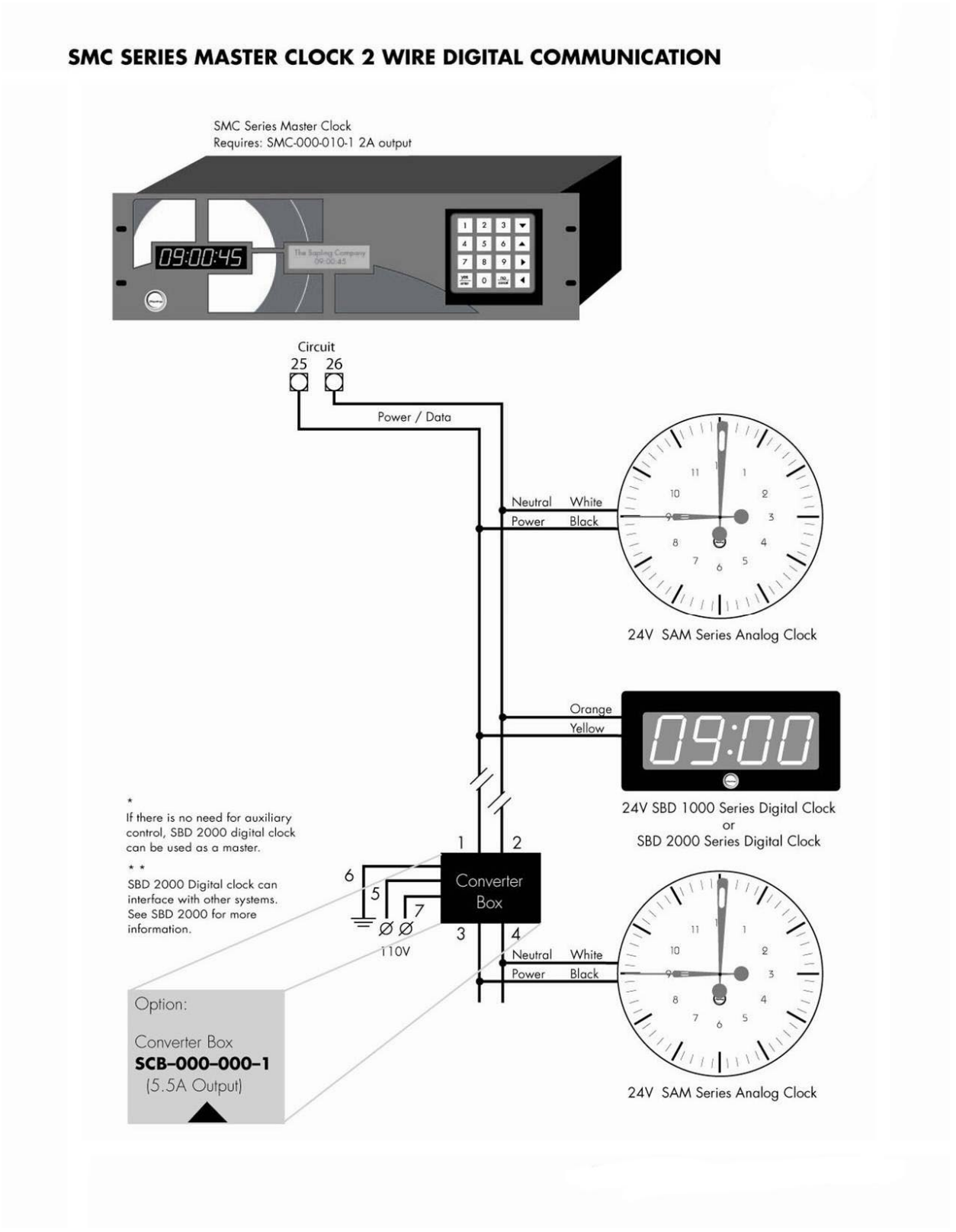
SMC SERIES MASTER CLOCK 2 WIRE DIGITAL COMMUNICATION



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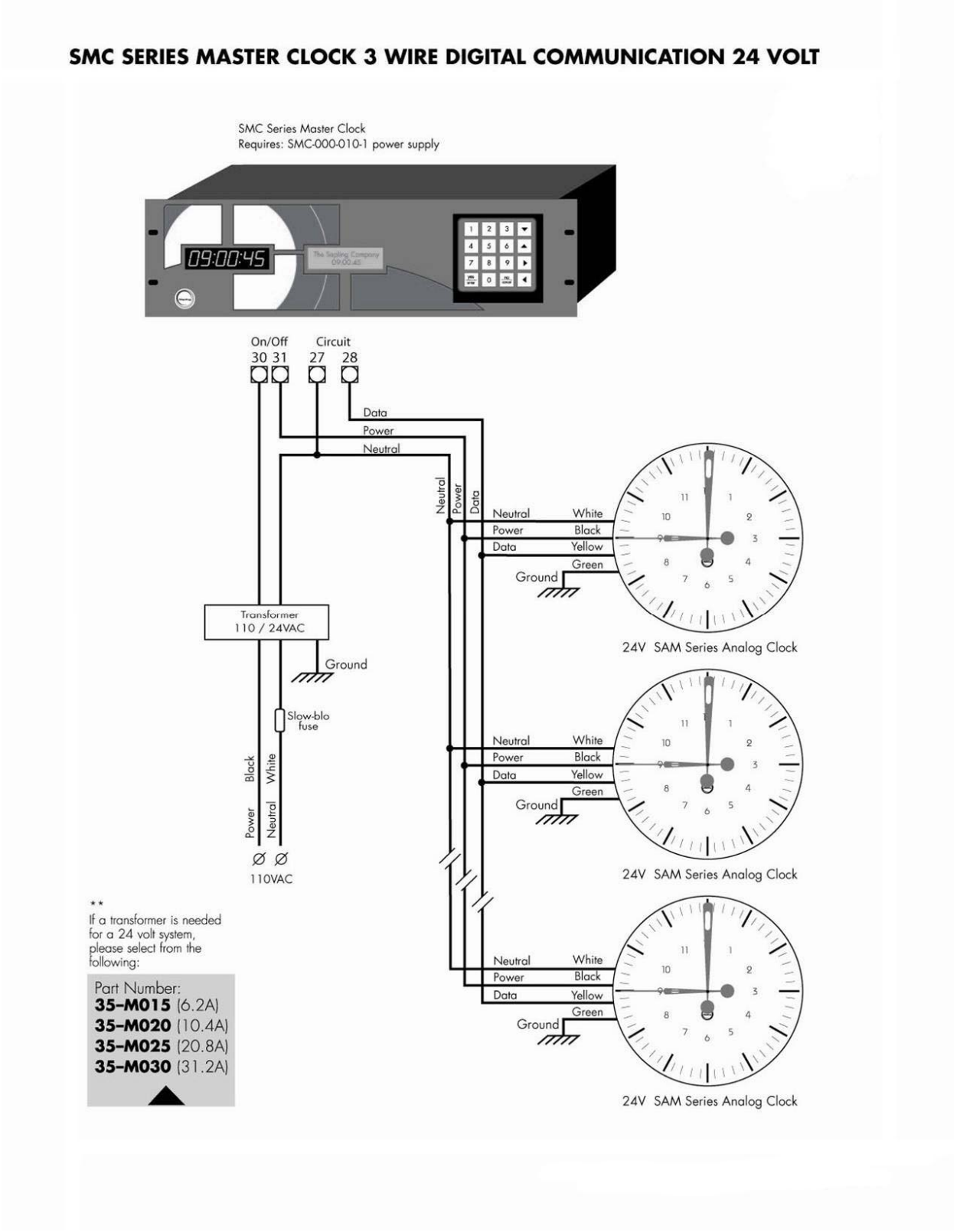
SMC SERIES MASTER CLOCK 3 WIRE DIGITAL COMMUNICATION 24 VOLT



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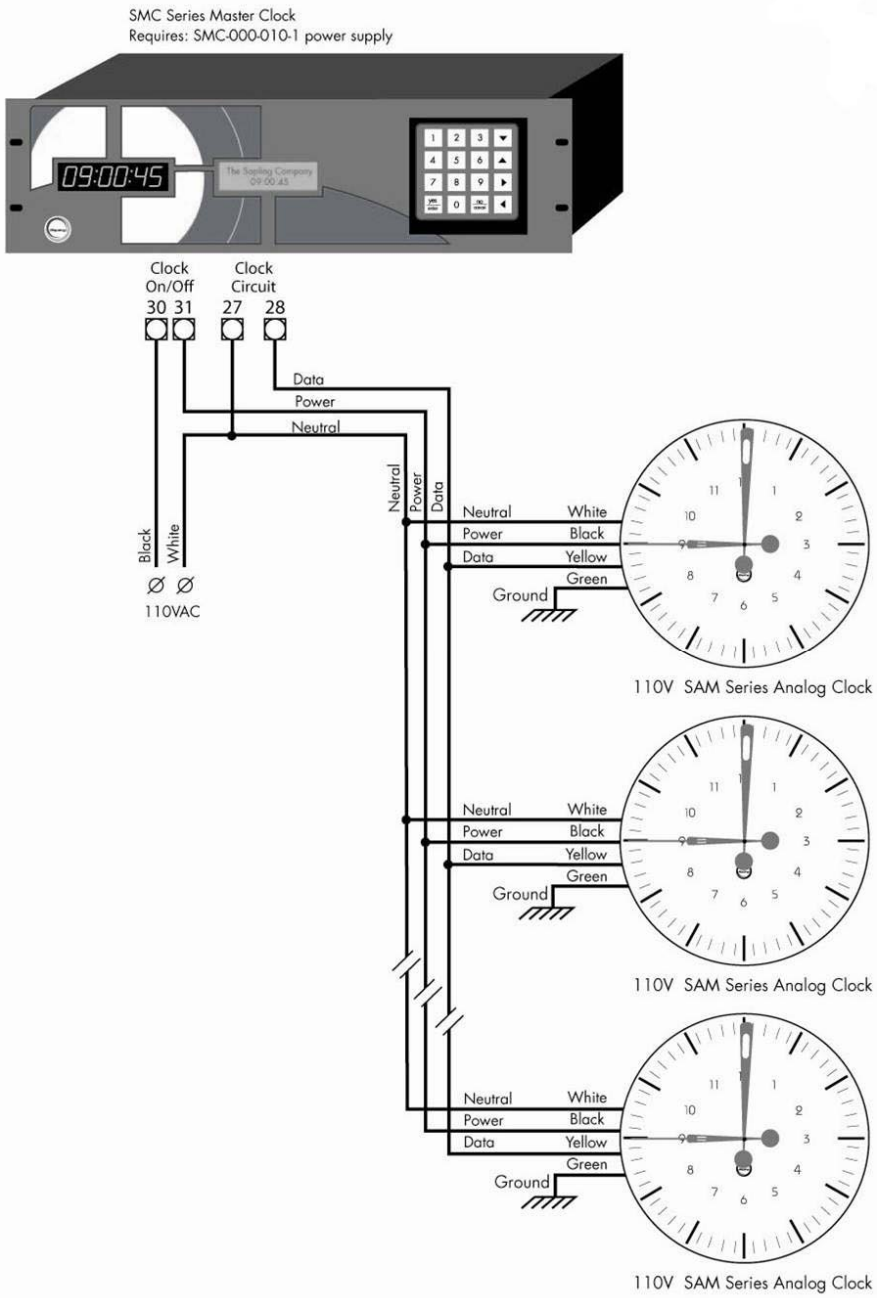
SMC SERIES MASTER CLOCK 3 WIRE DIGITAL COMMUNICATION 110 VOLT



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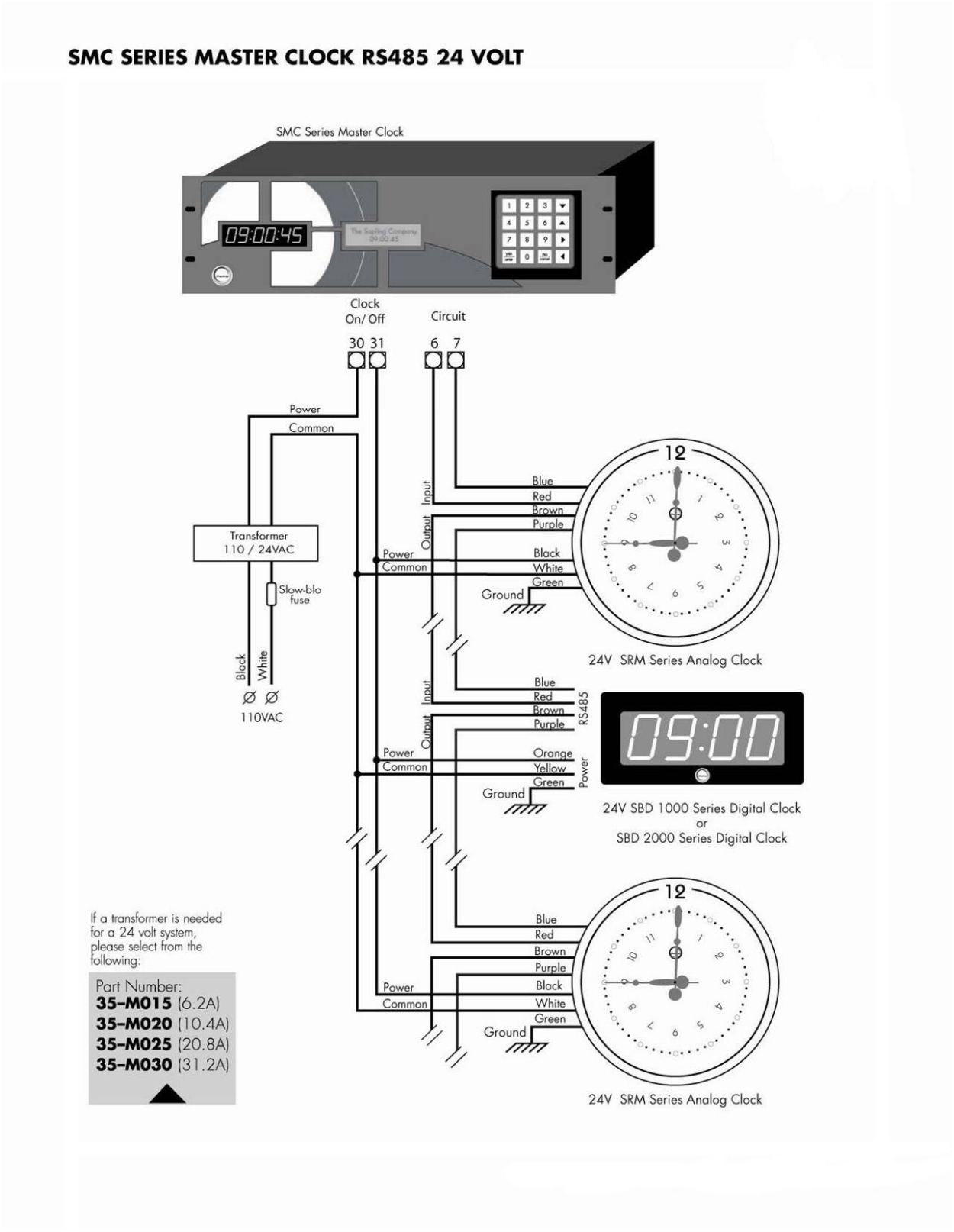
SMC SERIES MASTER CLOCK RS485 24 VOLT



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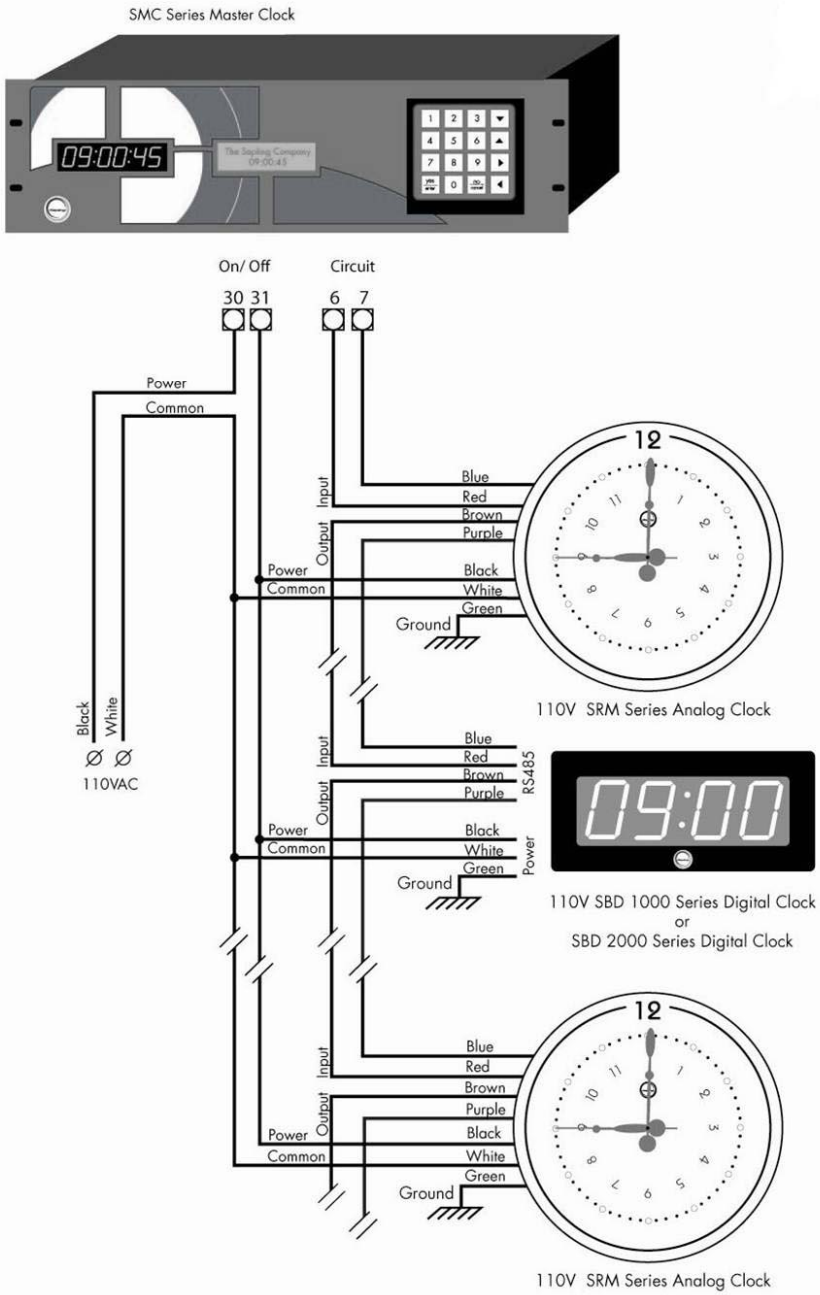
SMC SERIES MASTER CLOCK RS485 110 VOLT



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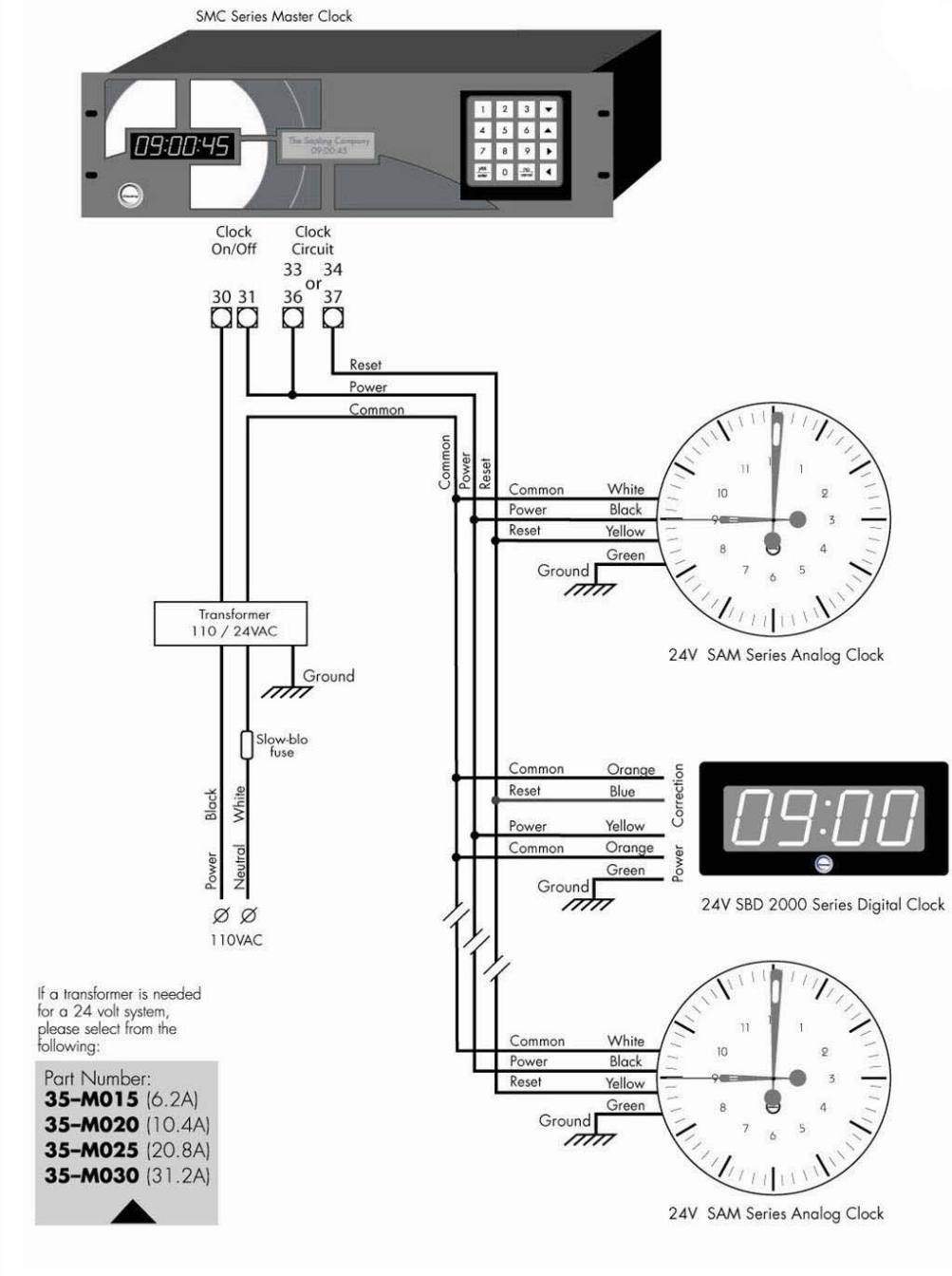
SMC SERIES MASTER CLOCK 3 WIRE SYNCHRONOUS 24 VOLT



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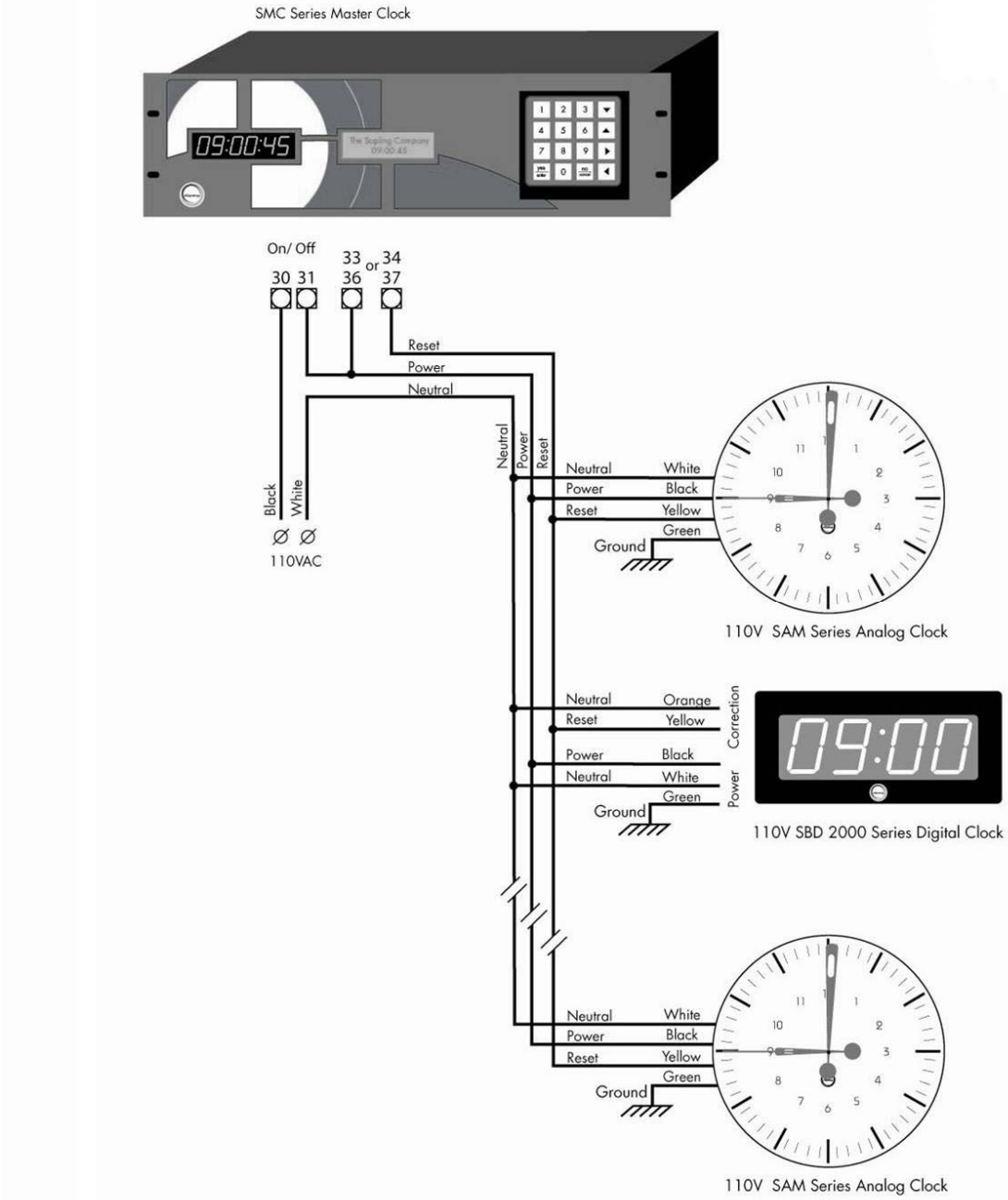
SMC SERIES MASTER CLOCK 3 WIRE SYNCHRONOUS 110 VOLT



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Interfacing With Other Systems

Slave Input Mode

Address 070: Slave input mode

(Please see diagrams below for wiring information and instructions)

000	Off
001	Midnight Reset / Once a Day Pulse Address 72 = Hour, Address 73 = Minute, Address 74 = Second
003	59 minute synchronous
004	58 minute synchronous
005	National Time and Rauland analog
006	Rauland Systems digital

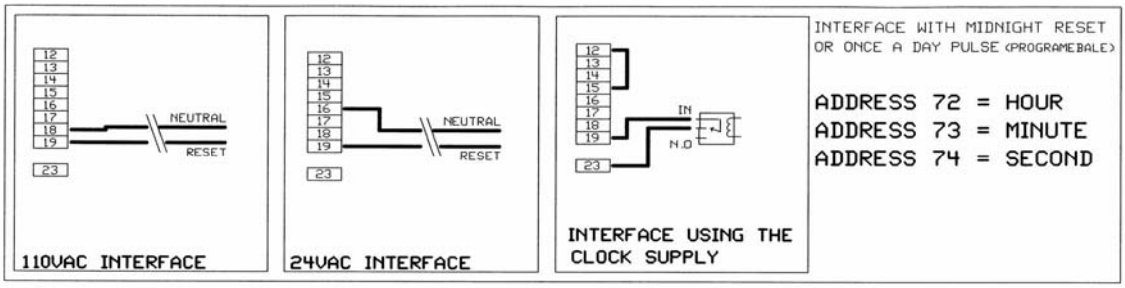
Address 075: Impulse clock mode

With the clock powered down, switch jumpers S2 and S4 on the relay board to S1 and S3. Power up the clock with the 50 watt power supply installed (part # SMC-000-010-1). Pins 25 and 26 will power up the impulse clocks. The time on the slave clock has to be entered in programming so the master clock will send out the correct amount of pulses to correct the clock.

Once you have entered all required information, press the <NO/CANCEL> key to exit programming mode.

MIDNIGHT RESET:

Applying a minimum of two-second pulse will bring the master clock to the correct time.



Instructions:

1. Set address 070 to “001”
2. Input the exact time (in hour, minute, second) that the clock should reset to when it receives the correction pulse. This data is entered into Addresses 072, 073 and 074 as shown in diagram above.
3. Connect input as shown in the diagram
4. Apply power to the clock.

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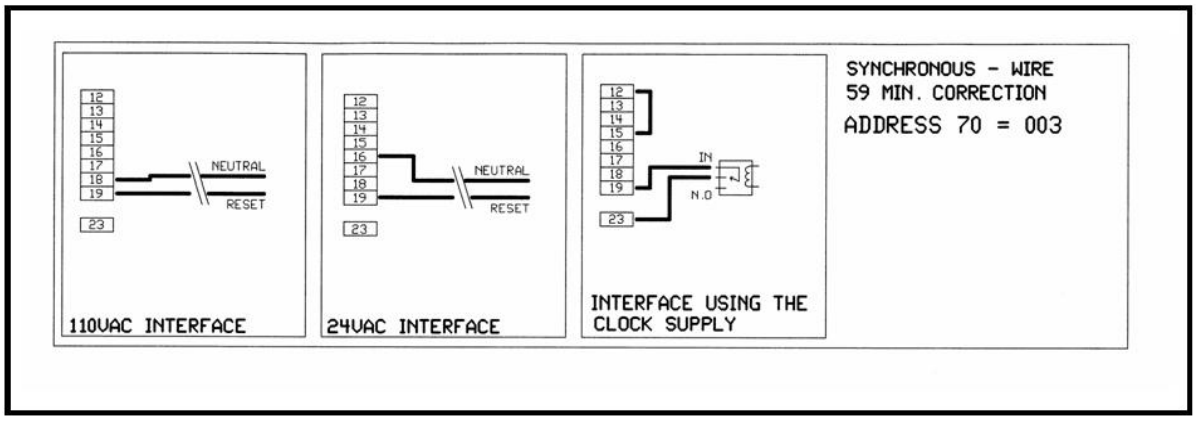
Interfacing With Other Systems

59 MINUTE CORRECTION

110 VAC/24 VAC 60 Hz is used to run the clock normally. Applying an eight (8) second reset signal from 57 minutes and 54 seconds will cause an hourly correction. Applying a fourteen (14) second reset signal from 5:57:54 will cause a daily correction.

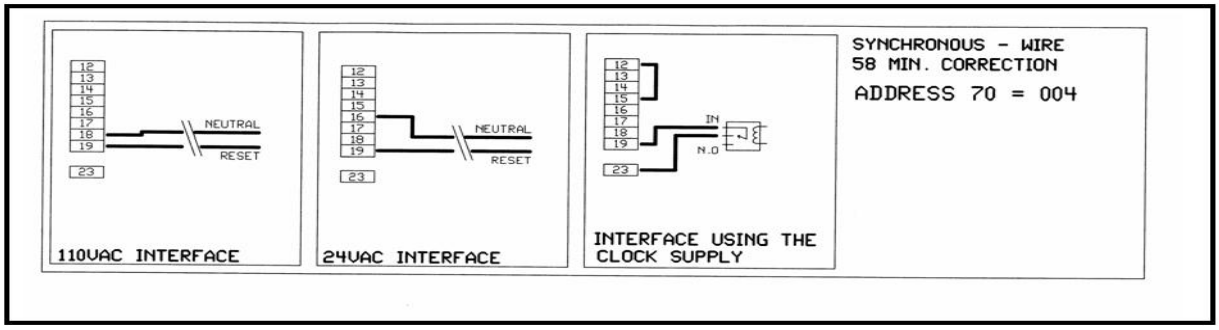


Instructions:

1. Set address 070 to “003”
2. Connect input as shown in the diagram.
3. Apply power to the clock.

58 MINUTE CORRECTION

110 VAC/24 VAC 60 Hz is used to run the clock normally. Applying a 55 second reset signal from 58 minutes and 05 seconds will cause an hourly correction. Applying a 55 second reset signal when hours equal 05 or 17 and minutes equal 03, 07, 11, 15, 19, 23, 31, 35, 43 or 47 and seconds equals 05 will cause a daily correction.



Instructions:

1. Set address 070 to “004”
2. Connect input as shown in the diagram.
3. Apply power to the clock.

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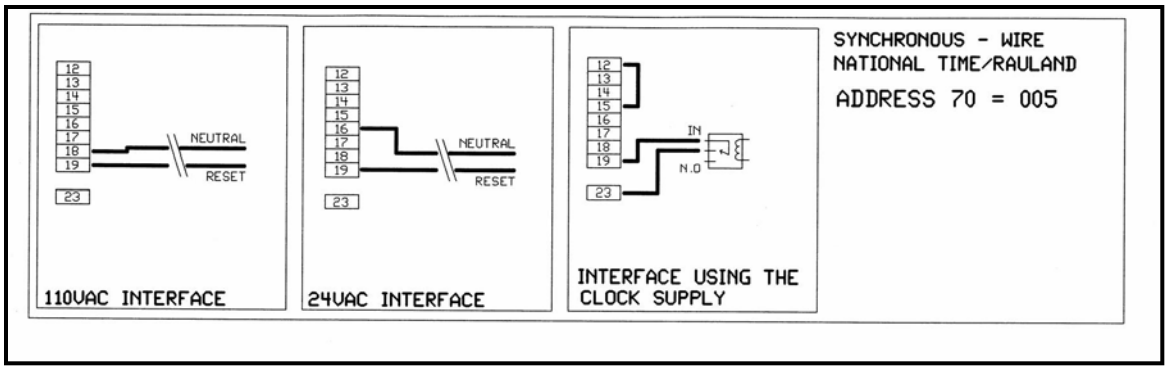
Synchronous Protocol Information

NATIONAL TIME and RAULAND CORRECTION (Analog Clocks)

110 VAC/24 VAC 60 Hz is used to run the clock normally. Applying a 25 second reset signal when minutes equal 00 and seconds equal 00 will cause an hourly correction. Applying a 24 minute reset signal when hours equal 06 or 18 and minutes equal 00 and seconds equals 25 will cause a daily correction.

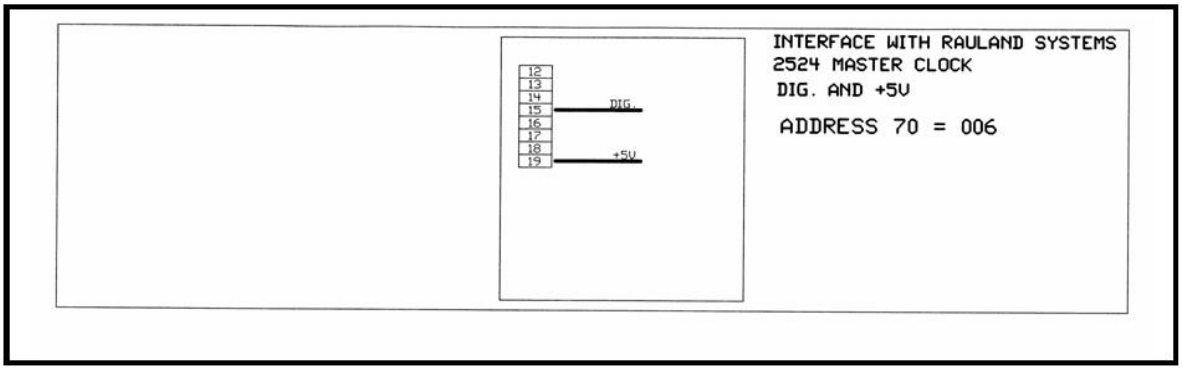


Instructions:

1. Set address 070 to “005”
2. Connect input as shown in the diagram.
3. Apply power to the clock.

RAULAND SYSTEMS CORRECTION (Digital Output)

Applying a half second pulse for every minute to the Dig. Line will bring the clock to the correct time. The clock will jump to the correct time at the end of the correction pulse.



Instructions:

1. Set address 070 to “006”
2. Connect input as shown in the diagram.
3. Apply power to the clock.

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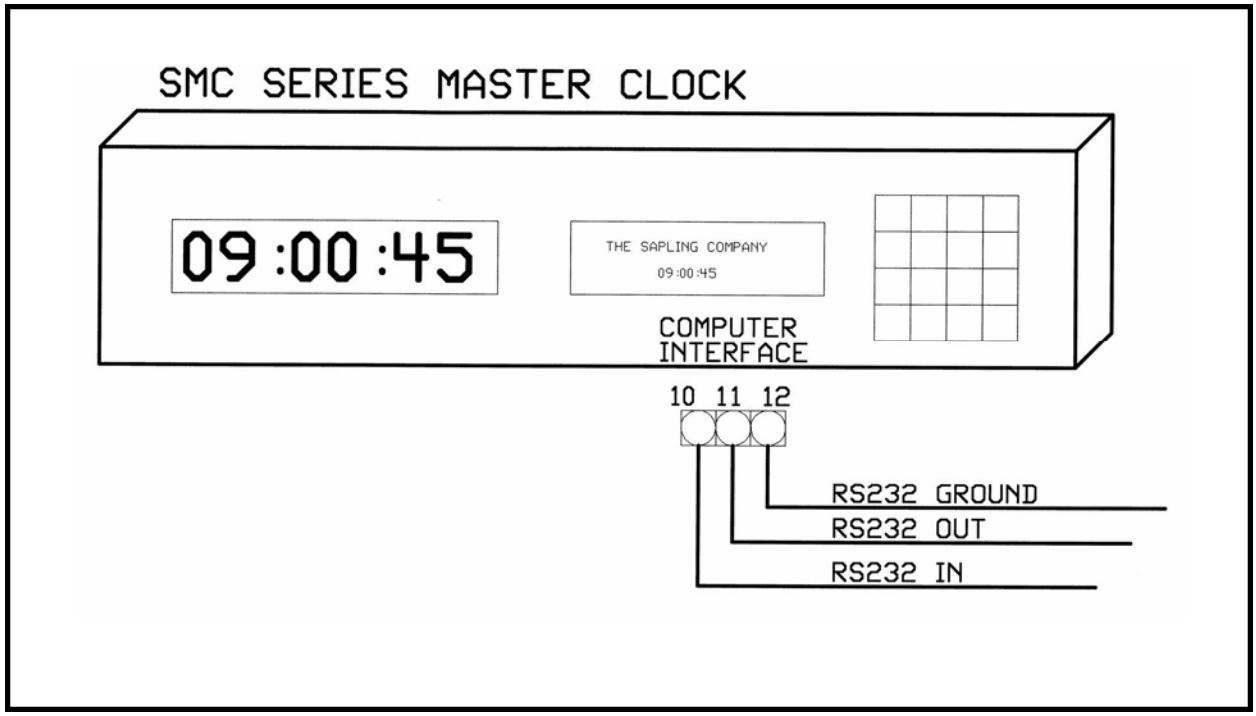
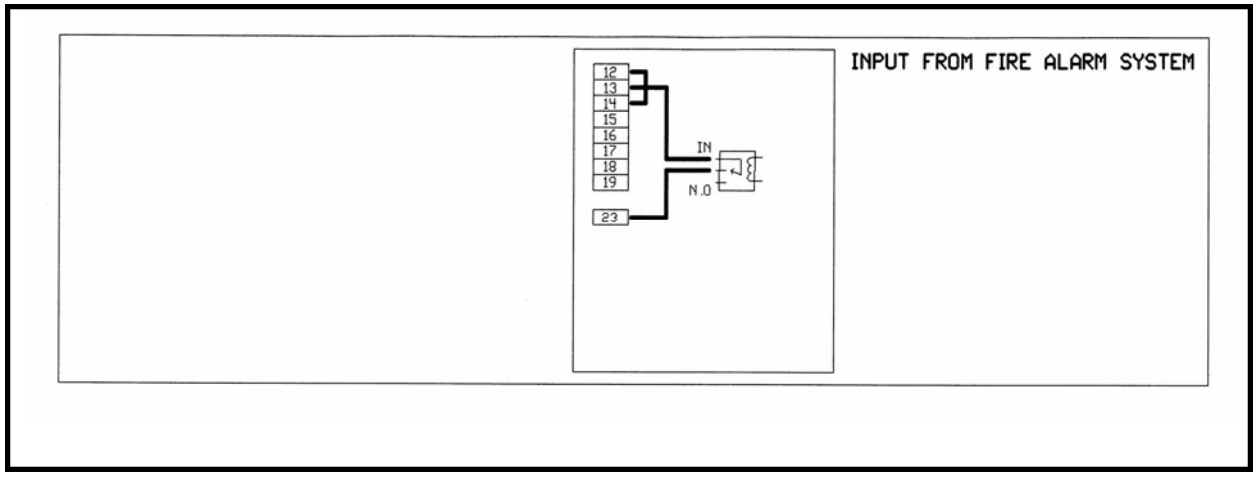
RS232 Interfacing



Fire Alarm System Interfacing



This function can only be used when running a digital clock system (either SBD 1000 or SBD 2000).

Instructions:

1. Connect input as shown in the diagram.
2. Apply power to the clock.

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Frequently Asked Question

What systems can I run off of the SMC 3000 Series Master Clock?

The SMC 3000 Series master clock can run 59 minute correction, 58 minute correction, National Time and Rauland, 2 and 3 wire digital communication (with optional auxiliary power supply installed), and Sapling RS485 systems.

Can I interface the SMC 3000 with a computer?

Yes, through the RS232 output on the master clock. The SMC 3000 also has software called MEDITOR which allows the user to enter, edit, and delete schedules and schedule changes through a Windows based program.

How many events can I schedule into the master clock?

There can be up to 800 events scheduled in the master clock.

I have to have a bell system in the school. How many relays are available in the SMC 3000 Series master clock?

There are four (4) relays standard with the master clock. The SMC 3000 master clock can utilize up to twelve (12) relays total.

What voltage can I use to power the SMC 3000 Master Clock?

The SMC 3000 master clock can be powered using 110 VAC/60 Hz or 220 VAC/50 Hz.

Will the master clock lose all of my settings if power is removed?

No, the SMC 3000 has a non-volatile EEPROM that ensures that the information stored will not be lost.

Is there anyway I can test to see if a relay is working?

Yes, through BIT testing, every aspect of the master clock can be tested to make sure everything is running optimally. For more information on BIT testing, please refer to the SMC 3000 programming manual.

Does the SMC 3000 have built-in bells?

No. The SMC 3000 does not contain any bells. It provides the relay closures for bell systems. Bells or tone generators must be purchased through a third party.

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Troubleshooting

What should I do if the master clock is not powering up?

Measure the voltage between pins one (1) & three (3). The voltmeter should read 85 - 135 VAC between the hot and the neutral.

I'm trying to control my SMC 3000 by using a Rauland master clock, but it doesn't seem to be working. What should I do?

Make sure the SMC 3000 is wired correctly to make sure it is capable of receiving the input. Also, make sure Address 070 is set to the right protocol.

My synchronous clock system is not correcting. What should I do?

Make sure the right correction code is inputted into the master clock circuit. Please refer to page 6 for details.

My 2 wire system doesn't seem to be working. How can I test the signal of the 2 wire digital communication circuit?

First, make sure the auxiliary power supply was installed (part number SMC-000-010-1). If the power supply is correctly installed, then put the voltmeter on DC voltage. Measure between pins 25 and 26 and verify that you have a pulsating 24 volts. If you do not have voltage there, contact Sapling technical support.

I'm interfacing the master clock with the GPS receiver. The master clock doesn't seem to correct. What should I do?

Make sure the polarity for the RS485 is correct coming from the GPS. If the polarity is reversed, the master clock will not correct.

The relay isn't closing for my bell system. How do I know if it's working?

The SMC 3000 has a self-testing feature called BIT testing. This will test all aspects of the master clock. Enter BIT testing and test the relay. For more information on how to enter BIT testing, please refer to the SMC 3000 programming manual.

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