Krontek KT160S/C Digital Clock

Operators Manual

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SETUP OVERVIEW

All settings are via three pushbutton keys on the rear of the clock:

The SYSTEM key, the TIME key and the ADJUST key. We will refer to these keys from now on as SYS, TIME and ADJ.

The keys operate as follows:

SYS enters System mode and sets the system options including the date.
(**Important** - the SYS key is required to be held down for at least 4 seconds to activate)

TIME enters Time mode and sets the time.

ADJ is used to make changes when either SYS or TIME mode is selected. The ADJ key is also used to select the display intensity when not in TIME or SYS mode.

Please note that if the Network Option is fitted most settings can be adjusted via the network. See “Network Interface Option” at the end of this manual.

When the clock first powers up it will briefly display its software revision number in the following format “X-YY” where X is the primary revision number and YY is the secondary. A “C” is appended for the calendar version.

Holding down any key during power up will reset the clock configuration to its default state.

The default state is:

Time: 00:00:00
24 hour display
Seconds on
Correction format: NONE
Time Zone Offset: 00:00
Daylight Savings: 0 (Off)
Date: 1-Jan-2005
Action display: Alert

The ADJ will auto-repeat if you hold the key down for more than 3 seconds and the repeat speed will increase after 8 seconds.

When in System mode pressing the TIME key will exit the System mode.

When in Time mode pressing the SYS key will exit the Time mode.

When more than one adjustable field is displayed the active field (the field you can change) will flash.

When referring to a displayed clock field in this manual the field is bracketed i.e. [SEC on].

SETTING THE CLOCK

1 Setting the time

If you are setting the time during Daylight Savings (DLS) do not add the extra hour i.e. if DLS time is 8:30pm you must enter the time as 7:30pm (Standard Time). When you set the DLS period (see 6 - Setting Daylight Savings) the clock will automatically adjust for DLS and add the extra hour.

Press TIME, the clock will display the time that the key was pressed and the hours will flash. The format is HHMMSS.

To change the hours use ADJ.

Press TIME again to advance to the minutes.

To change the minutes use ADJ.

Press TIME again to advance to the seconds.

Set the seconds about 10 seconds ahead of actual time then wait until actual time is the same before pressing TIME to set the time.

Pressing SYS will exit time setting without saving any changes made.

2 Selecting 12/24 hour format

Press and hold SYS, the clock will display [12Hr] or [24Hr] depending on the setting.

Press ADJ to alternate between the two settings.

Use TIME to exit this mode.

3 Selecting Seconds or AM/PM

Press SYS twice (2) times, the clock will display [SEC on] or [SEC of] depending on the setting. If seconds are turned off then the AM/PM indicator will be used.

Press ADJ to alternate between the two settings.

Use TIME to exit this mode.

Note: If AM/PM is selected the clock will default to the 12 hour format. This will not alter the 12/24 hour programmed setting.

4 Selecting the time reference correction format.

NONE is the default. For more detailed information on these formats and how the clock interprets them see the section at the end of the manual “Description of Time Correction Formats”.

The following formats are available:

[NONE] Clock uses the 50Hz power supply frequency
[Sbcd] Standard BCD serial data
[Ebcd] Extended BCD serial data
[Sr2] Minute Impulse – 59th minute correction
[RP] Minute Impulse – reverse polarity
[Sync] Sync wired
[Int] Internal Crystal (does not use power supply frequency)
[SLA] Slave when using another KT160 as a master
[ALPH] Alpha – Adaptive Micro Systems
[nET] Ethernet Network – requires network option

Selecting a format other than NONE or Int will disable time setting via the rear keys.

Press SYS three (3) times, the clock will display one of the above settings.

Press ADJ to select one of the settings.

Use TIME to exit this mode.

5 Setting the Time Zone Offset

Press SYS four (4) times, the clock will display the current offset as HHMM.

Press ADJ and the offset will change in 30 minute increments from [00:00] up to [23:30] and then from [–23:30] down to [00:00].

Use TIME to exit this mode.

6 Setting Daylight Savings

Press SYS five (5) times, the clock will display the current offset as DLS nn, where nn is the current setting.

The daylight saving period can be selected by pressing ADJ.

Selecting ‘0F’ disables daylight saving (use this setting for network option).

The preset daylight savings times numbered 1 – 6 are:

	Start	End	Where used
1	Last Sun in Oct at 2:00am	Last Sun in Mar at 3:00am	Australia Eastern
2	First Sun in Oct at 2:00am	Last Sun in Mar at 3:00am	Australia Tasmania
3	Last Sun in Mar at 2:00am	Last Sun in Oct at 3:00am	Europe
4	First Sun in Oct at 2:00am	Third Sun in Mar at 3:00am	New Zealand
5	Last Sun in Mar at 2:00am	Last Sun in Oct at 1:00am	UK
6	First Sun in Apr at 2:00am	Last Sun in Oct at 2:00am	USA

7 Setting the Date

Note: The calendar clock will automatically calculate and display the day of week (Mon-Sun) from the date. The non-calendar clock requires the date to be set to enable daylight savings to operate.

Press SYS six (6) times, the date will display as DDMMYY and DD will flash.

To change the day of month use ADJ.

Press SYS to select the month.

To change the month use ADJ.

Press SYS to select the year.

To change the year use ADJ.

Press SYS to set the year and advance to setting the alert message.

8 Setting the Action Message

Press SYS nine (9) times, the date will display as DDMMYY and DD will flash.

To set the action message you must step through the date setting with the SYS key.

The action message is activated when a 24vdc voltage is applied to the 'action' terminals on the rear of the clock.

There are three display options for the action display (2 for the non-calendar clock) these are:

1. Alert
2. Evacuate (calendar clock only)
3. Timer

Select the desired action message using the ADJ key.

If Alert or Evacuate is selected press TIME to exit to the normal display.

If timer mode is selected you have the option of a count up or count down timer.

If the timer display is set to 00:00:00 the timer will count up from zero to 23:59:59 then roll over to zero and continue counting.

To preset the timer for count down mode, press the SYS key and the hours will flash, use the ADJ key to change the setting then press SYS to proceed to minutes, then again for seconds. SYS must be pressed after seconds to keep the selected time.

When 'action' is activated the display will count down to 00:00:00 and remain there until 'action' is deactivated, the preset time is then reloaded.

Press TIME to exit back to the normal display.

DESCRIPTION OF TIME CORRECTION FORMATS

This section is included to provide a description of how the clock interprets various time correction formats. It is worth noting that some were never designed for use with digital clocks.

In all cases except [Int] the clock utilizes the power frequency as its time base. The reason for this is that under most circumstances the power frequency is, on average, extremely accurate. We include the “on average” caveat as short-term power grid loading can cause the power frequency to vary. However most power utility companies will ensure a consistent frequency over a twenty-four hour period.

Note: To indicate that correction formats were received and executed the colon(s) will flash briefly each at each new minute (not applicable to Sync wired). If the correction signal is lost the clock will continue to run from the time of the last correction.

Internal [Int]: We will cover this first as this is not a correction format but an alternative to the power frequency time base which may not be reliable, such as sites that operate off local power generators. The internal clock crystal provides an accuracy of ± 1 minute a month. For accuracy of better than ± 5 seconds a month the clock should be ordered with the temperature compensated crystal oscillator (TCXO) option.

Standard BCD [Sbcd]: This format provides hours, minutes and seconds. It updates once a second. When using this format daylight savings should not be set as the master clock will provide the adjustment.

Extended BCD [Ebcd]: This format provides hours, minutes, seconds, day, month and year. It updates once a second. When using this format daylight savings should not be set as the master clock will provide the adjustment.

Minute Impulse (corrective) [Sr2]: This correction format was designed for mechanical analogue clocks and is interpreted slightly differently by this clock. Minute impulses synchronize the clock by setting the seconds to zero (if the clock is more than 10 seconds past the minute the clock will advance to the next minute). The clock ignores more than one pulse per minute, however the transition from a previous negative to positive minute pulse at the transition from the 59^{th} minute to zero minutes will cause the clock to set the minutes and seconds to zero (if the clock is more than 10 minutes past the hour the clock will advance to the next hour). Daylight savings should be set (if used) as the clock will ignore daylight savings corrections from the master.

Minute Impulse (reverse polarity) [RP]: This format consists of minute impulses alternating in polarity. Minute impulses synchronize the clock by setting the seconds to zero. The clock ignores any more than one pulse per minute. Daylight savings should be set (if used) as the clock will ignore daylight savings corrections from the master.

Sync Wired [Sync]: This format consists of an 8 or 12 second pulse indicating an hourly or twelve hourly correction. When using this format daylight savings should not be set as the master clock will provide the adjustment.

Slave [SLA]: This format should be used if you wish to run a KT160 as a slave to another KT160. Master/Slave operation is achieved by wiring two or more clocks in parallel via the A and B terminals on the rear of the clock. If the Slave format is not selected the clock will operate as a Master by default. It is therefore important that all clocks except one be set as Slaves. Having two Masters on the same circuit will have unpredictable results.

Alpha [ALPH]: This format is compatible with the time string used by used by Adaptive Micro Systems for their moving message displays.

Syncroline [SLIN]: This is the Krontek Syncroline format.

Net [nET]: This format is compatible with SNTP (Simple Network Time Protocol). The clock will derive it's time from a network time server. The network interface option must be fitted for this format to function. See instructions that follow…

Network Interface Option

The Ethernet Interface is designed to enable a KT160N Clock to obtain time from a SNTP compliant network timeserver.

Setting the [net] correction format is not required as the Clock detects it has a network interface attached. However the [net] setting should be confirmed as part of the commissioning process.

After the Clock has been installed it must be configured to operate on your network.

The Clock comes pre configured with an IP address of 192.168.0.128 and responds to a telnet session on default port 23. There are three options to enable communications with the Clock:

1. Your network is already compatible, i.e. 192.168.0.xxx
2. Configure a PC to a compatible IP address, i.e. 192.168.0.50, and use a network crossover cable.
3. Use the Krontek DeviceDetector utility.

In reference to point 3, the DeviceDetector utility is supplied on a floppy disc with the clock. It is also available from our website www.krontek.com.au. DeviceDetector sends a UDP broadcast via port 10991 and displays the response from the clock. Each time the utility is opened it will send a single broadcast. It will display all Krontek time devices on the network – to change a device's settings click on that device. If you experience difficulties it may be that you are not on the same network or port 10991 is being blocked. Please note that a UDP broadcast will only operate within the same subnet – it will not pass through gateways. Please contact your supplier or Krontek if you require assistance.

Once the Clock is accessible on your network, open a telnet session using the IP address you have assigned:

telnet xxx.xxx.xxx.xxx

The following screen (or similar) will appear.

```
*********************************
*                               *
*            Krontek            *
*      KT160N Network Clock     *
*      Rev 2.40 15-Jun-2007     *
*                               *
*      MAC 00:20:4A:98:BA:DB    *
*                               *
*********************************


  -- Main Menu --

 1 - Timer Control Menu
 2 - Clock Options Menu
 3 - System Setup Menu

 99 - End telnet session
```

```
Select
```

The Timer Control Menu allows for timer operation. Both count up and count down timer modes are supported. Other than PReset the timer functions are self explanatory. PReset has two modes of operation depending on the count up or down mode. In count up mode, PReset will reset the display to zero once the timer is stopped. In count down mode, PReset will load the programmed preset count into the timer. If the preset time is greater than zero the timer will count down to zero and halt. If the preset time is zero, the timer will count down from zero i.e. the next second will be 99:59:59.

The Clock Options Menu enables the selection of various display options. Of importance is the ability to disable (or lock) the adjustment keys on the rear of the clock. It is recommend that the keys be locked if the clock is network enabled.

The System Setup Menu requires more detailed explanation:

```
  -- System Menu --

 1 - Set Time Server poll period
 2 - Set Daylight Saving
 3 - Set Time Zone Offset
 4 - Set Time Server IP address
 5 - Set Clock IP address
 6 - Reset Poll Error Counts
 7 - Display System Stats
 8 - Set/Change Passcode

 9 - Exit to Main Menu

Select
```

1. Set Poll Period allows the selection of the period between SNTP server polls, the minimum is 1 hour and maximum is 24 hours, one hour is recommended. Any changes must be saved. Selecting this item will also force a poll of the timeserver.

2. Set Daylight Saving produces a daylight saving table from which an entry can be selected. Alternatively daylight saving can be disabled or customised to your region. Note that the clock daylight saving setting should be set to ‘OF’

3. Set Time Zone Offset allows the entry of the number of hours added or subtracted from UTC (originally GMT). UTC is the time provided by a timeserver.

4. Set Time Server Address enables you to set the IP address of the SNTP server on your network. The screen will prompt you by showing the first octet in brackets (xxx) and allow you to change it or leave as is. Pressing “enter” will take you to the next octet, continue until all four are set. You can also set the subnet mask and gateway in this menu option.

5. Set Clock IP Address allows you to change the IP address and the Gateway address of the Clock. The screen will prompt you by showing the first octet in brackets (xxx) and allow you to change it or leave as is. Pressing “enter” will take you to the next octet, continue until all four are set.

6. Reset Poll Error Counts allows you to reset the count of failed timeserver polls.

7. Display System Stats displays various system data.

8. Set/Change Passcode allows you to set the passcode to restrict unauthorized access to the controller. Four characters are required. Alpha (A-Z) and numeric (0-9) characters are accepted. Lower case characters are internally converted to upper case. A code of four zeros (0000) will disable passcode checking.