

ClockBox Programming Commands:

Numbers in the following commands are represented by *decimal* numbers in the lsn of hex bytes
ex. 1307 is represented as 01 03 00 07.

Output Format and Location:

FO 00 00 50 40 01 **aa** *latitude* *longitude* *timezone* F7

where **aa**=01: MSC only
aa=02: MTC 30fr only
aa=03: MTC 30fr and MSC
aa=04: MTC 25fr only
aa=05: MTC 25fr and MSC
64°59'S <= *latitude* <= 64°59'N (5 digits including S/N)
179°59'E <= *longitude* <= 179°59'W (6 digits including E/W)
(S and E are represented by a 0, N and W are represented by a 1)
00 <= *timezone* <= 96 (specified in 15 minute increments from W to E with UTC=48, 2 digits)
timezone must be specified during Standard Time (*not* Daylight Saving Time)

ex. MSC only, New York, NY: 40°43'N 074°01'W, 5 hr. time difference during Standard Time from UTC
FO 00 00 50 40 01 01 04 00 04 03 01 00 07 04 00 01 01 02 08 F7

Set Date/Time:

FO 00 00 50 40 02 **year** **month** **day** **hour** **minute** **second** **dd** F7

where 2001 <= **year** <= 2255 (4 digits)
01 <= **month** <= 12 (2 digits)
01 <= **day** <= 31 (2 digits)
00 <= **hour** <= 23 (2 digits)
00 <= **minute** <= 59 (2 digits)
00 <= **second** <= 59 (2 digits)
dd=00: current time is Standard Time
dd=01: current time is Daylight Saving Time

ex. noon, January 1, 2002

FO 00 00 50 40 02 02 00 00 02 00 01 00 01 01 02 00 00 00 00 00 F7

Daylight Saving Time:

FO 00 00 50 40 03 **aa** **startmonth** **endmonth** **hour** F7

where **aa**=00: Daylight Saving Time OFF
aa=01: DST starts *first* Sunday of **startmonth**, ends *first* Sunday of **endmonth**
aa=02: DST starts *first* Sunday of **startmonth**, ends *last* Sunday of **endmonth**
aa=03: DST starts *last* Sunday of **startmonth**, ends *first* Sunday of **endmonth**
aa=04: DST starts *last* Sunday of **startmonth**, ends *last* Sunday of **endmonth**
01 <= **startmonth** <= 12 (2 digits)
01 <= **endmonth** <= 12 (2 digits)
01 <= **hour** <= 23 (2 digits)

ex. To program Clockbox to start DST the first Sunday in April and end DST the last Sunday in October at 2:00 am:

FO 00 00 50 40 03 02 00 04 01 00 00 02 F7

Footswitch:

FO 00 00 50 40 04 **aa** **hour** **minute** **second** F7

where **aa**=00: Footswitch has no effect
aa=01: Footswitch sets time to the following:
00 <= **hour** <= 23 (2 digits)
00 <= **minute** <= 59 (2 digits)
00 <= **second** <= 59 (2 digits)

Polarity of the footswitch is determined on power-up, in order to prevent spurious time changes the footswitch must be held for a minimum of 1 s

Note that the day/month/year is NOT changed, so it is advisable to set this time to something other than *midnight* or *daylight saving transition hour* (ex. if midnight is selected and footswitch is depressed at 23:59:59 instead of midnight, then the entire previous day will be repeated).

ex. To program Clockbox to set time to 3:00 PM every time footswitch is depressed:

FO 00 00 50 40 04 01 01 05 00 00 00 00 F7

Battery:

The battery should last for about 1 year with the ClockBox in the powered-down state, 8 years in the powered-up state

The maximum interval that the Clockbox can be powered down without losing its programmed time is 97 days

Replacement battery: CR2025

Messages Generated (values in hex):

The following messages are sent once every second (lsb first):

FO 7F 7E 02 7F 06 00 7F vv vv F7, vv vv = year (01 00 - 7F 01)
FO 7F 7E 02 7F 06 01 7F vv vv F7, vv vv = month (01 00 - 0C 00)
FO 7F 7E 02 7F 06 02 7F vv vv F7, vv vv = week (01 00 - 35 00)
FO 7F 7E 02 7F 06 03 7F vv vv F7, vv vv = day of month (01 00 - 1F 00)
FO 7F 7E 02 7F 06 04 7F vv vv F7, vv vv = day of week (01 00 - 07 00, sunday=1)
FO 7F 7E 02 7F 06 05 7F vv vv F7, vv vv = hour (00 00 - 17 00)
FO 7F 7E 02 7F 06 06 7F vv vv F7, vv vv = minute (00 00 - 3B 00)
FO 7F 7E 02 7F 06 07 7F vv vv F7, vv vv = second (00 00 - 3B 00)
(FO 7F 7E 02 7F 06 08 7F vv vv F7, vv vv = fraction of a second - not implemented)
FO 7F 7E 02 7F 06 09 7F vv vv F7, vv vv = day or night (night=00 00 , day=01 00)
FO 7F 7E 02 7F 06 0A 7F vv vv F7, vv vv = standard or daylight time (standard=00 00, daylight=01 00)

The following messages are sent only when they occur (lsb first):

FO 7F 7E 02 7F 06 40 7F vv vv F7, vv vv = countdown to sunrise in minutes (counts down to 00 00)
FO 7F 7E 02 7F 06 41 7F vv vv F7, vv vv = countup from sunrise in minutes (counts up from 01 00)
FO 7F 7E 02 7F 06 42 7F vv vv F7, vv vv = countdown to sunset in minutes (counts down to 00 00)
FO 7F 7E 02 7F 06 43 7F vv vv F7, vv vv = countup from sunset in minutes (counts up from 01 00)
FO 7F 7E 02 7F 06 44 7F vv vv F7, vv vv = switch standard or daylight time (standard=00 00, daylight=01 00)

The box can also be programmed to transmit **MTC 25fr** or **30fr**