Innovation WIRELESS

Synchronized Time & Communication Systems

KRONOsync Transmitter System Operations Guide

KRONO SYNC

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Thank You for Purchasing the KRONOsync GPS/NTP Wireless Clock System from Innovation Wireless.

We appreciate having you as a customer and wish you many years of satisfied use with your KRONOsync clock system. Innovation Wireless has incorporated our 30+ years of experience in clock manufacturing with the best of today's innovative technology into the KRONOsync system. The result being an accurate, reliable, 'Plug and Play', wireless clock system for your facility.

Please read this manual thoroughly before making any connections and powering up the transmitter.

Following these instructions will enable you to obtain optimum performance from the KRONOsync Wireless Clock System. If you have any questions during set-up, please contact **Technical Support** at **1-888-559-5565.**

Thank you again for your purchase.

From all of us at Innovation Wireless

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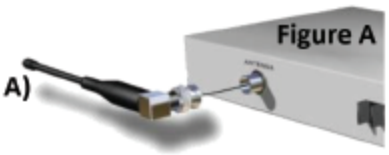
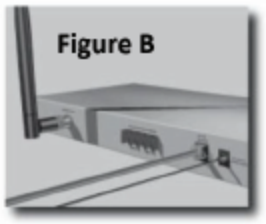
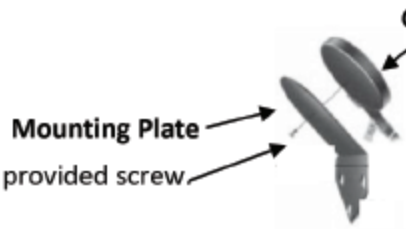
KRONOsync Transmitter Set-up



1. Screw Transmitter antenna onto the back of Transmitter. **(Figure A)**
2. Choose GPS or NTP receiver time source options:
    a. **GPS Receiver** - Plug the end of GPS cable into the GPS socket located on the back of the Transmitter. *(See Mounting the GPS Receiver instructions below).*
    b. **NTP Receiver** - Plug the NTP Receiver cable into the NTP socket located on the back of the Transmitter. *(See Connecting the NTP Receiver below)*
3. Plug the enclosed power supply into the Transmitter. **(Figure B)**
4. Plug the power supply into a 120 VAC outlet.
5. Confirm proper settings of Time Zone, Frequency Channel and modify as needed.



Mounting the GPS Receiver



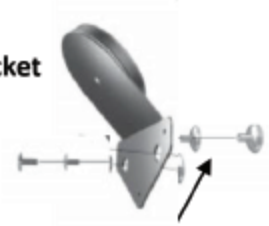
Connect the round GPS receiver onto the Mounting plate with the provided screw.

The GPS Receiver mounting options are as follows:

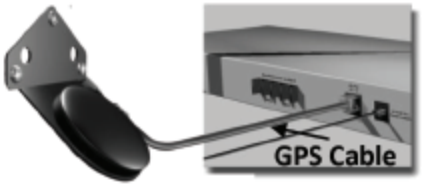
1. Outside wall mount with a clear view of the sky and no overhanging obstacles blocking its view.

2. Roof mount on a pole using the enclosed U bracket.

3. Mount the GPS Receiver on an inside window using the bracket with included suction cups. The GPS Receiver will not receive a signal through Low-E coated glass.

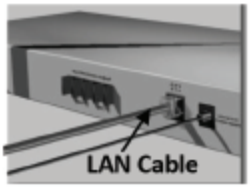


4. Connect the GPS cable attached to the GPS Receiver into the back of the transmitter.



Connecting the NTP Receiver

(See Figure C)



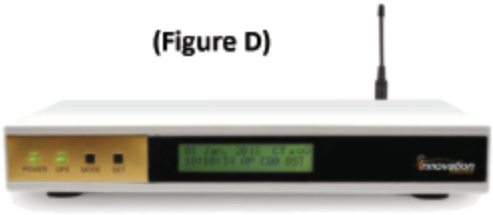
1. Plug Ethernet cable from your network, into the NTP Receiver socket marked (LAN).
2. Plug one end of the supplied LAN cable into the NTP receiver socket marked Transmitter on the front of the Receiver.
3. Plug the other end of the LAN cable into the socket labeled GPS/NTP on the back of the transmitter.

(Figure C)

Power LED

The Power LED Indicator located on the front left side of the transmitter will light up green once you have connected the included power supply to the transmitter and then to an active 120 VAC outlet.

(Figure D)



Transmitter Display

DISPLAY FIELD	NOTES
DAY/MONTH/YEAR	Will be automatically set by GPS
TIME ZONE (UTC OFFSET)	Factory Pre-set
GPS/NTP INDICATOR	See GPS/NTP Communication
TIME	Automatically set by GPS or NTP
AM/PM 12/24 HOUR INDICATOR	Factory set to 12 hour
CHANNEL #	Factory Pre-set
DST (DAYLIGHT SAVINGS TIME)	Factory set to DST (On)

GPS/NTP Communication

The GPS/NTP LED indicator located on the front of the Transmitter will light up when the Transmitter is communicating with the GPS/NTP Receiver **(See Figure D)**. The following characters on Transmitter display, indicate the status of the GPS/NTP communication.

DISPLAY FIELD	NOTES
“.”	There is no communication with the GPS/NTP Receiver
“.o”	There is communication with the GPS/NTP Receiver; however, time is not valid.
“.oO”	There is communication with the GPS/NTP Receiver. Time is valid.

Day/Month/Year

Display will show the Day/Month/Year received from the GPS satellites or NTP network server.

GPS/NTP Time

Displays Atomic clock based time received from the GPS/NTP Receiver. Upon initial set-up, the display will show a beginning time of 12:00:00. After installation and connection of GPS/NTP receiver, the GPS/NTP LED will light up green and the Transmitter displayed time will change to GPS/NTP based time.

The System Transmitter comes preprogrammed. To manually change any of the settings, perform the following steps:

Programming

To begin programming, press and hold down **Mode** Button for 3 to 5 seconds.
While in program mode, whenever you press the **Mode** Button, the menu options change as follows:

Use **SET** to cycle through the options of each of these settings, and then hit **MODE** to go to next option.	
Frequency Channel	**World Clock (ON or OFF)**
Time Zone (UTC Offset)	**Sync Out**
12/24 Hour Operation	**Time**
DST (ON or OFF) Or Choice of Country	

Once the desired setting is selected, press **MODE** to complete programming.

Frequency Channel

The Factory has preset your transmitter to an FCC assigned Frequency Channel. CH 00.
If it becomes necessary to change the Frequency Channel, follow these steps:

1. Press and hold the **MODE** button located on front of transmitter until **CHANNEL** appears.
2. Press the **SET** button located on front of transmitter to change a different Frequency Channel.
3. Once the Channel is selected, push the **Mode** button to return to programming other features.

There are the 10 available channels as follows:

CHANNEL	MHz
00	467.2125 MHz
01	467.2375 MHz
02	467.2625 MHz
03	467.2875 MHz
04	467.3125 MHz
05	467.3375 MHz
06	467.3635 MHz
07	467.3875 MHz
08	467.4125 MHz
09	467.4375 MHz

Time Zone (UTC Offset)

To set the Transmitter to your Time Zone:

1. Press and hold the **MODE** button located on front of transmitter for 3-5 seconds until **UTC OFFSET** is displayed.
2. Press the **SET** button located on the front of transmitter until you find your correct time zone. There are 24 available time zones Worldwide.
3. Once the Time Zone is selected, press the **Mode** button to return to programming other features.
4. International Time Zones are listed by City. You can scroll through the selection by continuously pressing **SET.**

North American Time Zones
05: Eastern
06: Central
07: Mountain
08: Pacific
09: Anchorage
10: Honolulu

12 OR 24 Hour Operation

Your system is factory set for 12 hour operation. However, you can skip this step if you will operate on 12 hour time. If **AM** or **PM** is shown on the display, then the 12-hour option is selected. If neither **AM** nor **PM** is shown on the display, 24-hour option is selected.

To change from or to 12 hour operation:

1. Press and hold the **MODE** button located on front of the transmitter until **FORMAT** appears. Press the **SET** button to Select 12hr or 24hr operation.
2. Once the **Format** is selected, press the **Mode** button to return to programming other features.

Daylight Saving Time (DST)

Your Transmitter is factory set to have DST on and the display will show **DST+**. Select desired Country by continuously pressing **SET** and scrolling through the list below. Press **MODE** when desired Country is displayed to complete programming.

Country Listing
USA
EUROPE
AUSTRALIA
NEW ZEALAND
BRAZIL

If you want to turn it off:

1. Press **MODE** until you see **DST**.
2. Press the **SET** button to select **OFF**.

The letters **DST+** (Daylight Saving Time) will be displayed when adjustment for Daylight Saving Time is active. The letters **DST** will be displayed when adjustment for Daylight Saving Time is inactive. If **DST** is not on the display, Daylight Saving time is inactive.

World Clock (International Time Zones)

If special time zone clocks are purchased, select **YES.**

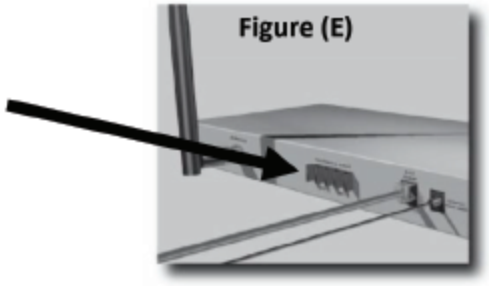
Sync Out

The transmitter comes with two relay output terminals located on the back of the Transmitter **(see Figure E).**
One terminal is **normally open** and the other is **normally closed**.

These terminals provide a relay output connection to the Synchronous Clock System. This relay output provides a 1 second dry contact closure at 23:59:59 every day.

Figure (E)

Relay Output Terminals



Time (Settings)

To set time manually, select **YES**. Continuing to press **MODE** will cycle through options as follows:

- Year
- Month
- Day
- Hour
- Minute

Use **SET** to cycle through the options of each of these settings, and then hit **MODE** to go to next option.

Detailed Transmitter Operation

The first time the power supply is attached to the transmitter, the transmitter will be in program mode and the green **POWER LED** will light. Program your transmitter to the desired settings. The Transmitter will initially show 12:00:00 and increment each second until it receives a valid time signal from the GPS/NTP Receiver. The **GPS/NTP LED** light turns on when the time information from the GPS/NTP Receiver is valid and the symbol oO will appear on the upper right corner of display.

Note: The transmitter will transmit the displayed time even if it is not GPS/NTP time.

Once the Transmitter receives the GPS/NTP Receiver time signal, the Transmitter sets its internal clock to that time and will display the correct time and date. The transmission signal is a UHF radio signal in the 467 MHz range that will transmit time data on one of the 10 available frequencies. The Frequency you will use has been approved by the FCC (Federal Communications Commission) and the system will be licensed by the FCC in the name of the end user at that location.
The Transmitter continually monitors the GPS/NTP Receiver and will update its internal clock with the time data it receives. The Transmitter transmits the time signal at 10 seconds, 30 seconds, and 50 seconds past each minute and on each minute.

Daylight Saving Time (DST)

The Transmitter is preprogrammed to automatically adjust for Daylight Saving Time. The letters **DST+** (Daylight Saving Time) will be displayed when adjustment for Daylight Saving Time is active. The letters **DST** will be displayed when adjustment for Daylight Saving Time is inactive. If neither **DST+** nor **DST** is displayed, then Daylight Saving time is not applied.
The adjustment to Daylight Saving Time and back to Standard Time takes place at 2:00 AM on the day of change.

Note: The GPS/NTP signal does not encode information about Daylight Saving Time. In the spring when the Transmitter changes to Daylight Saving Time, the system analog clocks will automatically adjust by advancing forward one hour to make the adjustment and then return to normal operation. In the fall when the Transmitter returns to Standard Time, the system clocks will automatically adjust by advancing forward eleven hours to make the time adjustment and then return to normal operation.

Detailed Analog Clock Receiver Operation

When batteries are put into the clock, the Clock hands will spin clockwise and stop at 12:00:00. The clock receiver is then activated and it will search for a signal from the transmitter. During the very first installation, the channel stored in the clock receivers non-volatile memory is "CH00" and it will initially search for this frequency. The clock will scan each channel automatically, taking up to 1 minute, searching each frequency until it finds the transmitter. If reception fails after scanning all the channels initially, the second hand of the Clock will begin to double step from the starting position of 12:00:00. Once the Clock receives the time signal from the Transmitter, the Clock sets its internal time and the hands will adjust to GPS/NTP time. The channel frequency will be memorized and stored in nonvolatile ROM at that time.

The Clocks receive updated GPS/NTP time data at 2:00, 6:00, 10:00, AM/PM every 24 hrs. When the Clock does not receive the signal, within 48 hours, the second hand of the clock will begin to double step, providing a visual indicator of a signal transmission problem at that clock's location. During Daylight Saving Time (DST) the clock will automatically adjust as follows:

- In the fall each year, when the time changes from DST to SDT, the clock hands will advance 11 hours.
- In the spring each year, when the time changes from SDT to DST, the clock hands will advance 1 hour.

Protecting your Transmitter

To protect your transmitter and ensure maximum life, please follow the guidelines below:

1. Place Transmitter in an area that has little human traffic and a spot where it will not get damaged.
2. The room temperature should be standard room temperature, but the transmitter can handle normal internal building temperature fluctuations.
3. It should not be stored against a metal cabinet or metal wall. The metal could prevent the transmitter from achieving maximum output.
4. In environments that are prone to power outages, it is suggested to put the transmitter on a UPS (Uninterruptible Power Supply) system. This will protect the system from significant power spikes. Like any other electronic device, a significant power surge could damage the circuitry.
5. Put the transmitter on a Monthly/Quarterly "maintenance" schedule. Visually inspect the transmitter and ensure
   a. The transmitter is in a safe location.
   b. Has power
   c. The GPS/NTP LED is green (lit).

Troubleshooting/Questions?
Please Call: 1-888-559-5565