



## Software Release Notes: Linux Driver for TSync™ Family



9-Nov-22

# Driver Version 4.0.2: Release Notes

Orolia has released a new Linux driver for the TSync family. Customers can download this software update at no charge from the Orolia website (see [How to download and install the new SW.](#))

For your convenience, older releases are also described in this document.

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## Version 4.0.2

### *Enhancements and fixes*

- Added support for Linux kernels. Tested up to 5.19
- Updated documentation for a `modprobe: key was rejected by service error` message. For more information, see the troubleshooting section of [How to download and install the new SW.](#)

## Version 4.0.1

### *Release features*

- Added support for Chrony in addition to the existing NTP support. These changes include changes to installation libraries; see [How to download and install the new SW](#) for more information, including Linux distribution-specific commands.

## Version 3.3.1

### *Enhancements and fixes*

- Added support for Linux kernels. Tested up to 4.10
- Added `waitForTo` API to support a timeout parameter when waiting for an event. (-1 for infinite wait, or numeric value for timeout in milliseconds)
- Fixed rollover/backstep bug. This would occur during the rollover to the next minute.
  - 47.999992
  - 47.999995
  - 48.999999
  - 48.000003 (Rollback)
  - 48.000006

## Version 3.20

### *Release features*

- Added support for u-blox GNSS receiver.

### *Enhancements and fixes*

- Added support for Linux kernels. Tested up to 4.2
- Added support for Trimble Resolution SMT-GG upgrade
- Updated NTP install instructions

## Version 3.12

### *Release features*

- Added support for the TSync-PMC & TSync-PCI-104.

### *Enhancements and fixes*

- Added Driver Version information in Linux driver so when using the command "`modinfo tsyncpci`", the driver version will now be displayed.
- Removed old "TPRO" `.c` and `.h` files that are not used by the driver.

## Version 3.10

### *Release features*

- Added support for the TSync-cPCI.

### *Enhancements and fixes*

- Added support for Linux kernels. Tested up to 3.12.x
- Added the following API commands:
  - TSYNC\_CS\_getNextSec
  - TSYNC\_GO\_getSWOtpPW
  - TSYNC\_GO\_setSWOtpPW
  - TSYNC\_GR\_getConstSel
  - TSYNC\_GR\_setConstSel
  - TSYNC\_HW\_getIntTs
  - TSYNC\_XO\_getCalVal



## Version 2.51

### *Enhancements and fixes*

- Added the following APIs:
  - `HW_GetTemperature` (for TSync cPCI boards only)

## Version 2.50

### *Enhancements and fixes*

- Added support for kernels up to 2.6.39 and 3.0.0.
- Fixed bug in Linux makefile. Wrong "\*.rules" file was being installed on versions of Redhat 5 & 6.

## Version 2.41

### Enhancements and fixes

*The following improvements were applied to existing features and functions:*

- Added support for kernels down to 2.6.9. Tested on RHEL 4.
- Removed the following API's:
  - ETP\_GetFormat
  - ETP\_GetMode
  - ETP\_GetOffset
  - ETP\_SetFormat
  - ETP\_SetMode
  - ETP\_SetOffset
  - FR\_GetOffset
  - FR\_SetOffset
- Added the following new API's:
  - ETP\_GetCfg
  - ETP\_SetCfg
  - GO\_GetSWTmAlgnEn
  - GO\_SetSWTmAlgnEn
  - GR\_GetRefId
  - IR\_GetRefId
  - PTR\_GetRefId

## Version 2.30

### *Enhancements and fixes*

- Updated/tested to support kernels from 2.6.15 to 2.6.35.
- Added shared lib support (libtsync.so).
- Added new API's "HW\_ClrIntCount" & "HW\_GetIntCount".
- Updated NTP patch to support NTP revision ntp-4.2.6p2.
- Fixed NTP reference bug.
- Fixed many compile warnings.

## How to download and install the new SW

### *Downloading the Software Update*

The latest TSync Linux driver update can be downloaded from the Orolia website under:  
<https://www.orolia.com/documents/tsync-pcie-ntp-linux-driver>

## Driver Installation

Check OS-Specific information for data on prerequisites.

Some commands may require root privileges.

The TSync driver contains three packages included in your driver installation file:

1. `tsync-driver`: a kernel module for Tsync
2. `libtsync`: a library to access the Tsync Card
3. `tsync-utils`: a group of programs to use the Tsync Card

To install all packages:

1. Load your installation file: `tsync-x.x.x.tar.xz` to your chosen location
2. Run: `tar xJf <tsync-x.x.x.tar.xz>`
3. run: `make all`
4. run: `sudo make install`
5. run: `sudo modprobe tsyncpci` (to load tsync modules into kernel)
6. run: `lsmod |grep tsyncpci` to confirm module loaded

## OS-Specific Information

Compilation of the Linux Driver requires Linux kernel headers to be installed. To install headers, enter the command for your distribution.

### **Debian and Ubuntu:**

```
apt install linux-headers-$(uname -r)
```

### **Cent OS, Red Hat:**

```
yum install kernel-devel-$(uname -r)
```

### **Fedora:**

```
dnf install kernel-devel-$(uname -r)
```

## NTP and PTP Setup

Follow the setup instructions for the TSync PTP clock with the NTP daemon for either Chrony or ntpd.

## Chrony

1. Edit the config file. Depending on your distribution, it will be located at `/etc/chrony.conf` or `/etc/chrony/chrony.conf`. Add the following line:  
`refclock PHC /dev/ptp-tsync poll 0 trust`
2. Restart the daemon:  
`systemctl restart chrony` or  
`systemctl restart chronyd` (`chrony` or `chronyd` is distribution-dependent).
3. Check the source availability:  
`chronyc sources`
4. Check the functionality:  
`watch chronyc tracking` (use CTRL + C to stop)  
and confirm both the reference PHC0 and the UTC date

## ntpd

Note: You may need the additional `linuxptp` package.

1. Edit the file `/etc/ntp.conf` and add the SHM clock with the following lines:  
`server 127.127.28.0 minpoll 4 maxpoll 4 prefer`  
`fudge 127.127.28.0 time1 0.420 refid GPS`
2. Create the SHM clock:  
`phc2sys -E ntpshm -s /dev/ptp-tsync -O 0 -M 0 &`
3. Restart the daemon:  
`systemctl restart ntp`
4. Check the SHM:  
`ntpq -p`

# Troubleshooting

## Missing libsync.so

Certain system installations may receive the following error message after installation:

*error while loading shared libraries: libtsync.so: cannot open shared object file: No such file or directory*

To resolve:

1. Verify the presence of the file in the system:  
`ls /usr/lib/libtsync*` for 32-bit units and  
`ls /usr/lib64/libtsync*` for 64-bit units  
(the command should return `libtsync.so` in either case).
2. If the file does not exist, execute  
`sudo make libtsync-install`
3. If the file exists, reload the runtime library cache:  
`Ldconfig`

## Modprobe: key was rejected by the service

Systems with a secure kernel cannot load the tsyncpci module and see the following error message:  
*Key was rejected by the service*

To resolve:

Note: this fix is applicable on most distributions with UEFI Secure Boot and CONFIG\_MODULE\_SIG enabled:

1. Create a signing key

See [https://access.redhat.com/documentation/en-us/red\\_hat\\_enterprise\\_linux/8/html/managing\\_monitoring\\_and\\_updating\\_the\\_kernel/signing-kernel-modules-for-secure-boot\\_managing-monitoring-and-updating-the-kernel#generating-a-public-and-private-key-pair\\_signing-kernel-modules-for-secure-boot](https://access.redhat.com/documentation/en-us/red_hat_enterprise_linux/8/html/managing_monitoring_and_updating_the_kernel/signing-kernel-modules-for-secure-boot_managing-monitoring-and-updating-the-kernel#generating-a-public-and-private-key-pair_signing-kernel-modules-for-secure-boot)

2. Sign the module with your generated private key

See [https://access.redhat.com/documentation/en-us/red\\_hat\\_enterprise\\_linux/8/html/managing\\_monitoring\\_and\\_updating\\_the\\_kernel/signing-kernel-modules-for-secure-boot\\_managing-monitoring-and-updating-the-kernel#signing-kernel-modules-with-the-private-key\\_signing-kernel-modules-for-secure-boot](https://access.redhat.com/documentation/en-us/red_hat_enterprise_linux/8/html/managing_monitoring_and_updating_the_kernel/signing-kernel-modules-for-secure-boot_managing-monitoring-and-updating-the-kernel#signing-kernel-modules-with-the-private-key_signing-kernel-modules-for-secure-boot)

3. Enroll the key in MOK with `mokutil`

See [https://access.redhat.com/documentation/en-us/red\\_hat\\_enterprise\\_linux/8/html/managing\\_monitoring\\_and\\_updating\\_the\\_kernel/signing-kernel-modules-for-secure-boot\\_managing-monitoring-and-updating-the-kernel#enrolling-public-key-on-target-system-by-adding-the-public-key-to-the-mok-list\\_signing-kernel-modules-for-secure-boot](https://access.redhat.com/documentation/en-us/red_hat_enterprise_linux/8/html/managing_monitoring_and_updating_the_kernel/signing-kernel-modules-for-secure-boot_managing-monitoring-and-updating-the-kernel#enrolling-public-key-on-target-system-by-adding-the-public-key-to-the-mok-list_signing-kernel-modules-for-secure-boot)

## How to contact Technical Support

Visit Orolia's TSync Support Page for more information, or to request product support:

<https://www.orolia.com/support/timing/tsync>

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