



# libtock-c

<https://github.com/tock/libtock-c>

TockWorld 7 | June 2024



# Headlining Change: New style for libtock

- Consistent style
- Namespacing
- Two libraries:
  - libtock
  - libtock-sync
- libtock is now async-only
- Programming guide explaining style

```
int humidity_read(void) {
    syscall_return_t rval = command(DRIVER_NUM_HUMIDITY, 1, 0, 0);
    return tock_command_return_noalue_to_returncode(rval);
}

int humidity_read_sync(unsigned* humidity) {
    int err;
    result.fired = false;

    err = humidity_set_callback(humidity_upcall, (void*) &result);
    if (err < 0) return err;

    err = humidity_read();
    if (err < 0) return err;

    // Wait for the callback.
    yield_for(&result.fired);

    *humidity = result.humidity;

    return 0;
}
```

Before

```
returncode_t libtock_humidity_read(libtock_humidity_callback cb) {
    returncode_t err;

    err = libtock_humidity_set_upcall(humidity_upcall, cb);
    if (err != RETURNCODE_SUCCESS) return err;

    err = libtock_humidity_command_read();
    return err;
}
```

```
returncode_t libtocksync_humidity_read(int* humidity) {
    returncode_t err;

    result.fired = false;

    err = libtock_humidity_read(humidity_callback);
    if (err != RETURNCODE_SUCCESS) return err;

    yield_for(&result.fired);
    if (result.ret != RETURNCODE_SUCCESS) return result.ret;

    *humidity = result.humidity;

    return RETURNCODE_SUCCESS;
}
```

After

# New library support

- OpenThread (networking)
- U8G2 (monochrome graphics)
- RadioLib (networking)

# Build System Updates

- Compile and provide full newlib
  - No longer use system-installed headers
- Different libcpp for each GCC version
  - Library is coupled with each compiler version
- Support `Makefile.setup` for libraries
  - Allows for fetching library source
- Libraries build automatically when required for app

<p><b>libtock: alarm: include assert.h</b> #441 by bradjc was merged last week - Approved</p> <p><b>U8G2: Add GIFs to readmes</b> #440 by bradjc was merged 2 weeks ago - Approved</p> <p><b>openthread: update with new 15.4 calls</b> #439 by bradjc was merged last week - Approved</p> <p><b>15.4: Add new raw 15.4 commands; try to turn on radio</b> #438 by bradjc was merged last week - Approved</p> <p><b>test: 154 rx: show errors on RX calls</b> #437 by bradjc was merged last week - Approved</p> <p><b>libtock-sync: 154: fix return error</b> #436 by bradjc was merged 2 weeks ago - Approved</p> <p><b>Update 15.4 radio_tx_raw app</b> #435 by tyler-potyondy was merged 2 weeks ago - Approved</p> <p><b>alarm: create ms_to_ticks helper function</b> #434 by Samir-Rashid was merged 2 weeks ago - Approved</p> <p><b>move courses to tock-archive</b> #433 by bradjc was merged 3 weeks ago - Approved</p> <p><b>libopenthread: namespace platform</b> #431 by bradjc was merged last month - Approved</p> <p><b>make: depend on uncrustify config</b> #430 by bradjc was merged last month - Approved</p> <p><b>format: Need to go 5 levels deep now.</b> #429 by bradjc was merged on May 13 - Approved</p> <p><b>library: lvgl: Build library instead of shipping pre-built binaries</b> #428 by bradjc was merged last month - Approved</p> <p><b>library: lua: Build instead of pre-built libraries</b> #427 by bradjc was merged last month - Approved</p> <p><b>CPS IoT 2024 Thread Network Tutorial</b> #426 by tyler-potyondy was merged on May 13 - Approved</p> <p><b>IEEE802154 libtock-sync sending timeout</b> #425 by tyler-potyondy was merged on May 12 - Approved</p> <p><b>LibOpenThread Radio Minor Changes</b> #424 by tyler-potyondy was merged on May 12 - Approved</p> <p><b>libtock-sync: add missing static</b> #422 by bradjc was merged on May 10 - Approved</p> <p><b>tutorials: thread_network</b> #419 by cherrypiejam was merged on May 10</p> <p><b>Update pinned Tockloader rev to v1.12.0</b> #418 by lschuermann was merged on May 8 - Approved</p> <p><b>Add uncrustify options (2024 edition)</b> #417 by bradjc was merged on May 15 - Approved</p> <p><b>Add library headers to formatting</b> #416 by bradjc was merged on May 14 - Approved</p> <p><b>hotp: fix to new libtock and kv</b> #415 by bradjc was merged on May 10 - Approved</p> <p><b>Resolve gettimeasticks imprecision</b> #414 by tyler-potyondy was merged on May 9 - Approved</p> <p><b>Port alarm to new libtock-c design</b> #413 by hudson-ayers was merged on May 6 - Approved</p>	<p><b>u64 returncode</b> #410 by tyler-potyondy was merged on Apr 26 - Approved</p> <p><b>Add EU164 Syscall Support</b> #409 by tyler-potyondy was merged on May 7 - Approved</p> <p><b>update libnrfserialization to modern libtock-c make</b> #407 by bradjc was merged on Apr 23 - Approved</p> <p><b>make: use \$(TOCK_USERLAND_BASE_DIR) as ROOT</b> #406 by bradjc was merged on Apr 23 - Approved</p> <p><b>Real targets for LINK_LIBS (now SYSTEM_LIBS)</b> #405 by ppanuto was merged on Apr 19 - Approved</p> <p><b>tock: add userspace read allow return function</b> #404 by bradjc was merged on Apr 17 - Approved</p> <p><b>libtock: tock: add u32_u32 command helper</b> #403 by bradjc was merged on Apr 17 - Approved</p> <p><b>make: include library paths only for library build</b> #402 by bradjc was merged on Apr 19 - Approved</p> <p><b>move lora examples to wip directory</b> #401 by bradjc was merged on Apr 17 - Approved</p> <p><b>make: apps: app compilation depends on libs</b> #397 by bradjc was merged on Apr 10 - Approved</p> <p><b>make: install: update to modern use of tockloader</b> #396 by bradjc was merged on Apr 6 - Approved</p> <p><b>u8g2: use paths in src file</b> #392 by bradjc was merged on Apr 5 - Approved</p> <p><b>make: TockLibrary: Build in full paths</b> #391 by bradjc was merged on Apr 6 - Approved</p> <p><b>make: TockLibrary: unconditionally set build dir</b> #390 by bradjc was merged on Apr 5 - Approved</p> <p><b>Fixed documentation on behaviour on return from main</b> #389 by ioan-Cristian was merged on Apr 10 - Approved 2 tasks done</p> <p><b>make: tocklib: fix debug comment</b> #388 by bradjc was merged on Apr 2 - Approved</p> <p><b>U8g2 graph app</b> #385 by bradjc was merged on Apr 23 - Approved</p> <p><b>u8g2: add support for menus</b> #384 by bradjc was merged on Apr 23 - Approved</p> <p><b>make: support automatically building libraries when compiling apps</b> #383 by bradjc was merged on Apr 23 - Approved</p> <p><b>build(deps): bump express from 4.17.3 to 4.19.2 in /examples/courses/2018-11-SenSys/sensys_udp_rx/server <a href="#">dependencies</a></b> #382 by dependabot[bot] was merged on Apr 1 - Approved</p> <p><b>OpenThread Port</b> #380 by tyler-potyondy was merged on May 9 - Approved 8 tasks done</p> <p><b>Update elf2tab in nix shell</b> #379 by alexy was merged on Mar 22 - Approved</p> <p><b>readme: no RISCv flag</b> #378 by bradjc was merged on Mar 22 - Approved</p> <p><b>IEEE 802.15.4 Updates for Kernel Ring Buffer</b> #376 by tyler-potyondy was merged on Mar 22 - Approved</p> <p><b>Resolve fetching sha256sum failure</b></p>	<p><b>15.4 Send Raw Syscall Command <a href="#">WG-Network</a></b> #371 by tyler-potyondy was merged on Feb 27 - Approved</p> <p><b>libtock: Rewrite and standardize API</b> #370 by bradjc was merged on May 7 - Approved 10+ tasks done</p> <p><b>newlib/libcopp: update commit hash in dockerfile</b> #369 by bradjc was merged on Feb 9 - Approved</p> <p><b>make: tocklibrary: never build with -Werror</b> #368 by bradjc was merged on Mar 5 - Approved</p> <p><b>AppMakefile: depend on libcpp and newlib for cc,cpp,cxx build rules</b> #367 by lschuermann was merged on Feb 5 - Approved</p> <p><b>Alarm overflow - gettimeasticks <a href="#">last-call</a></b> #366 by tyler-potyondy was merged on Feb 7 - Approved</p> <p><b>Remove custom RISC-V toolchain from Nix shell, remove Segger J-Link, update Tockloader to v1.11.0</b> #365 by lschuermann was merged on Jan 29 - Approved</p> <p><b>examples/lora/build-RadioLib.sh: remove depency on /bin/bash</b> #364 by lschuermann was merged on Jan 29 - Approved</p> <p><b>Add u8g2 library support <a href="#">last-call</a></b> #363 by bradjc was merged on Mar 10 - Approved</p> <p><b>Add screen-tock test app</b> #362 by bradjc was merged on Apr 23 - Approved</p> <p><b>example: i2c-usb-bridge: Initial support</b> #361 by alistair23 was merged on Jan 12 - Approved</p> <p><b>HOTP: Remove app state from milestone 2</b> #360 by bradjc was merged on Apr 23 - Approved</p> <p><b>Add exists() checks for sensors</b> #359 by bradjc was merged on Jan 12 - Approved</p> <p><b>tests: add simple kv check app</b> #358 by bradjc was merged on Jan 7 - Approved</p> <p><b>format pressure code</b> #356 by bradjc was merged on Dec 5, 2023 - Review required</p> <p><b>libtock: sys: Implement _gettimeofday</b> #355 by alistair23 was merged on Dec 14, 2023 - Approved</p> <p><b>build(deps): bump set-value from 3.0.1 to 3.0.3 in /examples/courses/2018-11-SenSys/sensys_udp_rx/server <a href="#">dependencies</a></b> #354 by dependabot[bot] was merged on Nov 3, 2023 - Approved</p> <p><b>make: use pre-compiled newlib and libc++</b> #353 by bradjc was merged on Jan 17 - Approved</p> <p><b>Added Functions to call Pressure Sensors</b> #351 by TheBunterMineCutter was merged on Nov 26, 2023 - Approved</p> <p><b>make: update elf2tab to 0.12.0</b> #350 by bradjc was merged on Oct 5, 2023 - Approved</p> <p><b>libtock: update breaking driver existence check changes</b> #349 by Samir-Rashid was merged on Jan 7 - Approved</p> <p><b>build(deps): bump debug from 3.2.6 to 3.2.7 in /examples/courses/2018-11-SenSys/sensys_udp_rx/server <a href="#">dependencies</a></b> #348 by dependabot[bot] was merged on Oct 6, 2023 - Approved</p> <p><b>Update the HOTP App to use Key Value Store <a href="#">last-call</a></b> #347 by bradjc was merged on Dec 5, 2023 - Approved</p> <p><b>lora: Initial support for sensor example</b> #344 by alistair23 was merged on Jan 12 - Approved</p>
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PRs