



Protocol stack
license packages

STACKFORCE GmbH

15.10.2021

WE ENABLE & INTEGRATE CONNECTIVITY

STARTER

Explore the possibilities of wireless connectivity at small scale.

Commercial:

- Pre-paid royalties:
 - 100 copies
 - 500 copies
 - 1.000 copies
 - 5.000 copies

Technical:

- Protocol Stack: Object code
- RF Driver: Object code
- HAL: Source code
- Limited address range

Support & Maintenance:

- No support included
- 12 months of maintenance

PROFESSIONAL

Enables predictable scaling of wireless connectivity solutions.

Commercial:

- Pre-paid royalties:
 - 10.000 copies
 - 50.000 copies

Technical:

- Protocol Stack: Object code
- RF Driver: Object code
- HAL: Source code
- Limited address range

Support & Maintenance:

- 1PD of support within 12 months
- Support via email
- Response time: < 5 business days
- 12 months of maintenance

ENTERPRISE ¹

Technically unlimited, flexible business: Only pay what you need.

Commercial:

- Post-paid royalties:
 - Upfront fee
 - Quarterly reporting

Technical:

- Protocol Stack: Object code
- RF Driver: Object code
- HAL: Source code

Support & Maintenance:

- 1PD of support within 12 months
- Support via email
- Response time: < 5 business days
- 12 months of maintenance

UNLIMITED

No limits, no reports - unlimited wireless connectivity!

Commercial:

- One-off license fee

Technical:

- Protocol Stack: Object code
- RF Driver: Object code
- HAL: Source code

Support & Maintenance:

- 2PD of support within 12 months
- Support via email & phone
- Response time: < 2 business day
- 12 months of maintenance

PRE-PAID ROYALTIES

Pre-paid royalties are license fees for each copy of the software paid in advance for the whole number of ordered copies.

In contrast to software licensed via one-off or post-paid royalties, pre-paid royalty licensed software is technically limited to the exact number of software copies ordered and paid. This is e.g. done by limiting it to a certain address range reflecting the number of licensed copies. To extend the number of copies purchased, a new order needs to be placed and paid.

POST-PAID ROYALTIES

Post-paid royalties are consisting of an upfront fee as well as a license fee for each copy of the software.

1. The **upfront fee** is due in advance to delivery of the software.
2. Licensee frequently provides a report about the number of units produced and equipped with the licensed software. This report must be created and sent to STACKFORCE unsolicited within 30 days after the end of each quarter of a year. STACKFORCE will then invoice the **royalties** according to the relevant price per unit.

STACKFORCE has the right to verify correctness of the reports at any time. STACKFORCE also has the right to hire a third-party service provider for this verification. Licensee is obliged to support STACKFORCE resp. a hired third-party service provider by providing the necessary access to accounting and production information.

ONE-OFF LICENSE

One-off licensing is rather simple, it is a license agreement that grants rights for unlimited copies by paying a one-time fee only. The license fee is due in advance to delivery of the software.

RF Driver

The RF Driver implements that actual interface to a certain radio silicon. It contains all relevant configurations and state management of the respective radio and connects to the actual protocol stack. This component is hardware specific and not part of the actual protocol stack.

Hardware Abstraction Layer (HAL)

In order to operate a protocol stack in conjunction with a certain hardware, a HAL for a certain platform is required. The HAL consists of the necessary drivers and driver abstractions for either

- a microcontroller (MCU) or microprocessor (CPU),
- a single chip transceiver (TRX),
- a system-on-chip (SoC) combining MCU / CPU and TRX in one package or silicon,

The HAL typically connects the following required hardware functions to software (depends on stack and configuration) :

- 1 - 2 x Timer
- 1 x SPI, 2 - 4 x GPIO (applies to and depends on the actual single chip transceiver)
- Software RF interface (applies to system-on-chip)
- AES encryption, CRC calculation, Encodings (if available and applicable)

Limited address range

In order to enable the pre-paid royalty license model, all protocol standards that do require a unique address per device, get limited to a certain address range. This range includes a number of addresses, corresponding to the number of copies you're allowed to create, according to the related license agreement. This address range can be

- specified when ordering or
- assigned automatically from address pool by STACKFORCE.

Support

Workflow for every support request/case:

1. STACKFORCE receives a support request, provides first feedback including an effort estimation.
2. Based on feedback and effort estimation, customer will decide:
 - a. Approved: STACKFORCE will process the support request.
 - b. Declined: Processing of support case rejected (up to 1h will be charged to the budget though for first feedback).
3. In case STACKFORCE recognizes unforeseen issues preventing to keep efforts within initially approved budget, STACKFORCE will immediately inform Customer. Based on this updated effort estimation, customer will decide:
 - a. Approved: updated overall effort estimation accepted and processing of the support request will be continued.
 - b. Declined: Support case processing stopped, already spent efforts will be charged to the budget.

More details can be found at “Standard Support Conditions” document by STACKFORCE. This document can be found at the homepage www.stackforce.de or upon request info@stackforce.de.

Maintenance

Maintenance includes reception of new versions providing updates against the background of

- a) removal of malfunctions (bug fixes),
- b) functional improvements and
- c) functional extensions,

whereas type and scope regarding b) and c) are up to STACKFORCE.

Commercial upgrades ...

... to other volumes and license packages are possible as follows at any time:

- Increasing volume of included number of copies within license package “*Starter*” or “*Professional*”.
- Upgrading from license package “*Starter*” to “*Professional*”.
- Upgrading from any other license package to license package “*Unlimited*”.

Additional deliverables:

Every license agreement includes one deliverable as well as support & maintenance for this deliverable. For each additional deliverable, an additional fee per additional deliverable applies. This fee typically is way below the cost for a new license but is required though in order to cover support & maintenance for an additional deliverable.

Examples for purchasing additional deliverables:

1. After a functional upgrade (e.g. from unidirectional to bidirectional), the previously included deliverables shall still receive support and maintenance.
2. After purchasing a protocol stack suitable for radio silicon A, the stack shall also be used in another product based on radio silicon B.*

*: In case initial stack has been receiving a special discount related to silicon vendor Texas Instruments, the discount is not applicable anymore and needs to be balanced as a prerequisite for purchasing an additional deliverable related to another silicon vendor.

Functional upgrades ...

... are possible at any time. Functional upgrades for instance are, upgrade from

- *unidirectional* to *bidirectional* stack,
- *single* to *dual* stack,
- support for *additional hardware*,
- ...

Purchasing a functional upgrade by default

- a) extends an existing license agreement,
- b) replaces included deliverables.

Remaining runtime and budget of support & maintenance services included in the previous license agreement will be discarded, but probably replaced by services included in the new license.