Software Package Menu and Description

VERSION 6.0

OPTICALPRESS TEAM

2013 1st Korea Patent

2015 1st International Patent

2015 Join IEEE 802.15

2017 + 3 International Patents

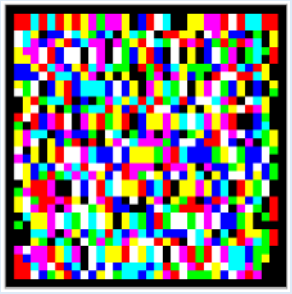
2017 Proposals to IEEE TG7m

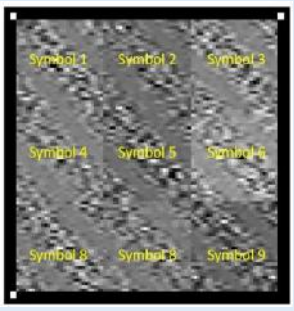
2018 +2 International Patents

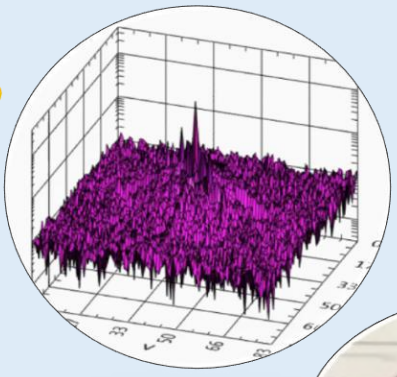
2018 OpticalPress Website

2019 OpticalPress TEAM

2019 OpenSource Project







Open Source Project

There are plenty of OCC open source codes available. Some of them are implementations from the IEEE 802.15.7-2018 standard, the most recent international standard for Optical Camera Communication. Some of them are even more advanced than the existing PHY modes within IEEE standard when we apply the multi-carrier modulation concept to boost the data rate of OCC systems.

The most recent advanced codes which employ OFDM to OCC:

2D-OFDM Code (ACO-OFDM DCO-OFDM) • Simulation package • Optical Link Package (M-options) • Optimal Optical Link Package	*2D-OFDM details*
Rolling OFDM Code • Simulation package • Optical Link Package	*Rolling-OFDM details*

The codes implement IEEE 802.15.7-2018 standard as follows:

A-QL Code: • Optical Link Package • Optical Link Package (update)	*A-QL details*
HA-QL Code • Optical Link Package (update)	*HA-QL details*
C-OOK Code: • Back-to-back package • Simulation Package for BER comparison • Optical Link Package	*C-OOK details*

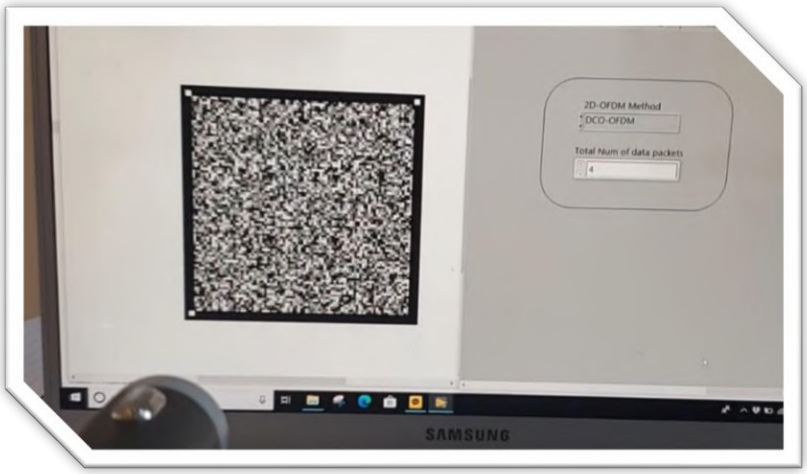
Our customers will find benefits from many more packages added. No additional cost applied to these packages.

The OpticalPress Team

2D-OFDM Code Project [View Online]

After the **IEEE 802.15.7-2018 A-QL** color code for Optical Camera Communication, **2D-OFDM** is one of the next generations for Mbps data rate transmission from a screen TX to a camera.

IMPORTANT: Two more packages available: Simulation package and Optical Link Package with changeable modulation mode (ACO or DCO). Triple benefit from the same price.



Package 1: Simulation (ACO/ DCO)

Package 2: Optical Link (ACO/DCO)

Package 3: Optimal DCO-OFDM

Advanced features from the 2D-OFDM Code:

TX technical features:

1. Read a file to transmit; Two-layer FEC code; Editable n-QAM modulation
2. Change between **ACO-OFDM and DCO-OFDM,** and **clipping factor** for PAPR
3. Editable MIMO (to change the number of independent sub-transmitter within a TX)
4. Editable spatial cyclic-prefix; editable bolder-size to protect TX
5. Controllable TX display size as each of tiny cells are re-sizable.
6. Controllable clock rate for changing refresh speed of TX

RX technical features:

1. Multi-tasking techniques for real-time image processing
2. Auto-detection and tracking the transmitter
3. Re-configurable TX extraction process
4. Auto-threshold for preamble detection
5. Re-configurable demodulation process
6. Real-time data display and BER monitoring
7. Real-time monitor **Constellation diagrams**

Technical Documents for 2D-OFDM System (link for more details):

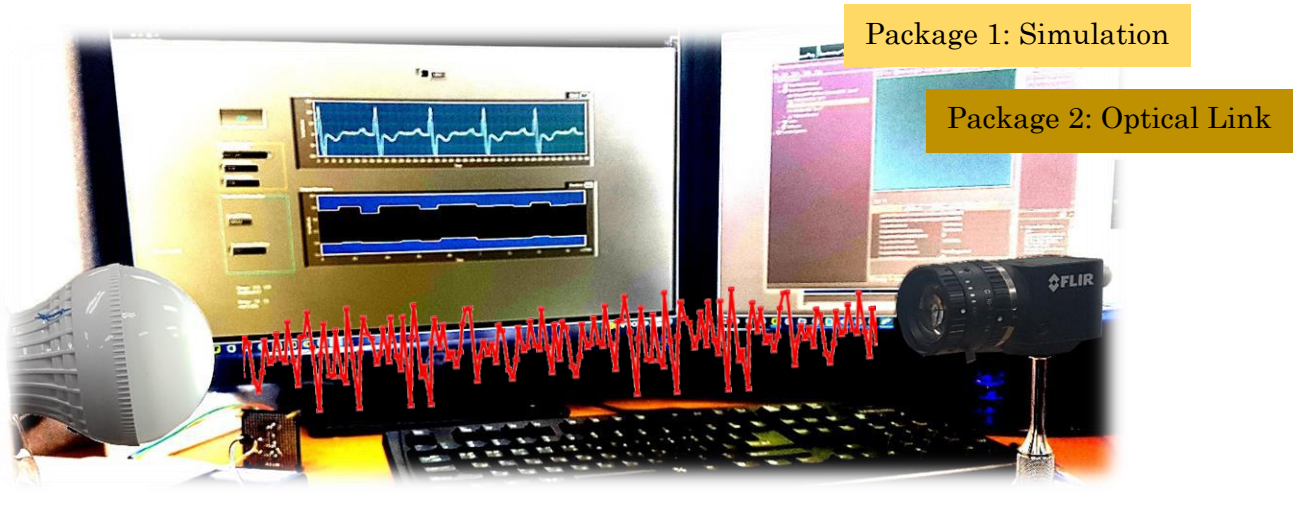
Generation of 2D-OFDM | 2D-OFDM BER Measurements

Rolling-OFDM Code Project [View Online]

After the **IEEE 802.15.7-2018 C-OOK** for Optical Camera Communication, the single-carrier modulation technique, **Rolling-OFDM** is one of the next generations for greater data rate transmission from LED light source(s) to a camera using multi-carrier concept.

Our Rolling-OFDM implementation is mature by the employment of multi-carrier concept, just as LiFi. However, being particularly designed for OCC, all the physical data packet units (PPDU) are carefully constructed.

The Rolling-OFDM Code project is cleaned, well-packed and documented.



Advanced features from the Rolling-OFDM Code Project:

TX technical features:

1. Read a file to transmit, Forward Error Correction code
2. Editable n-QAM modulation, Editable cyclic-prefix, changeable clipping factor
3. Editable data packet unit size
4. Controllable optical clock rate.

RX technical features:

1. Multi-tasking techniques for real-time image processing
2. Use-defined region-of-interest to extract data from light source(s)
3. Re-configurable demodulation process
4. Real-time data display and BER monitoring and Constellation diagram

Technical Documents for Rolling-OFDM System (Link for more details):

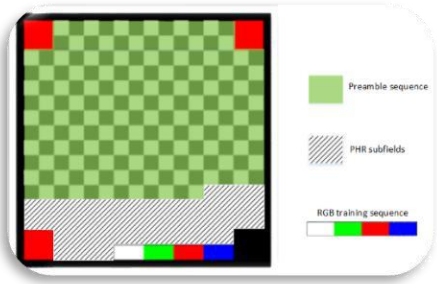
Concept of Rolling-OFDM | Rolling-OFDM for biomedical application

A-QL Code Project [View Online]

A-QL stands for Asynchronous Quick Link, a two-dimensional multi-band color code sequential transmission protocol from a screen to camera. The A-QL is one of mode within the **IEEE 802.15.7-2018** Optical Wireless Communication standard.

By using hundreds of cells and three-color band simultaneously (red, green, and blue wavelengths), the A-QL can provide tens of kbps data rate or more.

The (recent updated) A-QL Code Project is cleaned, well-packed and documented.



Advanced features from the A-QL Code Project:

TX technical features:

1. Read a file to transmit; Two-layer Forward Error Correction code (outer Reed-Solomon and inner Convolutional Code)
2. Controllable MIMO (number of cells within a TX)
3. Controllable TX display size as each of tiny cells are re-sizable.
4. Controllable clock rate for changing refresh speed of TX

RX technical features:

1. Multi-tasking techniques for real-time image processing
2. Auto-detection and tracking the transmitter
3. Auto- Walsh training process for color calibration
4. Re-configurable Two-layer error correction
5. Real-time data display and BER monitoring

Technical Documents for A-QL System (Link for more details):

A-QL Technical Specification

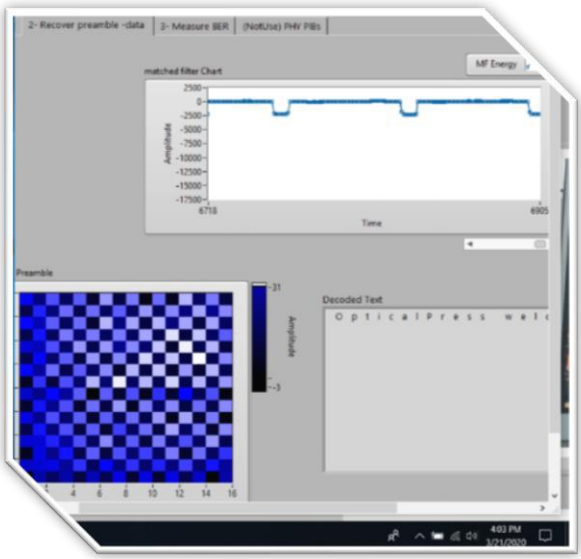
A-QL BER Measurement

HA-QL Code Project [View Online]

HA-QL (Hidden Asynchronous Quick-Link) is a hidden modulation mode among Screen-2-Camera operating modes within the **IEEE 802.15.7-2018** Optical Wireless Communication standard.

An interesting feature of HA-QL is that it allows for controlling the peak-to-peak amplitude of the intensity modulation, from a visible code to a hidden code.

The (recent updated) HA-QL Code Project is cleaned, well-packed and documented.



Advanced features from the HA-QL Code Project:

TX technical features:

1. Read a file to transmit, Convolutional Code with Interleaving
2. Controllable TX display size
3. Controllable the visibility level of TX to evolve from a visible code to a hidden code.
4. Controllable clock rate for changing refresh speed of TX

RX technical features:

1. Multi-tasking techniques for real-time image processing
2. Auto-detection and tracking the transmitter
3. Auto- threshold training process for data frame detection
4. Auto- threshold training process for preamble detection and packet recovery
5. Real-time data display and BER monitoring

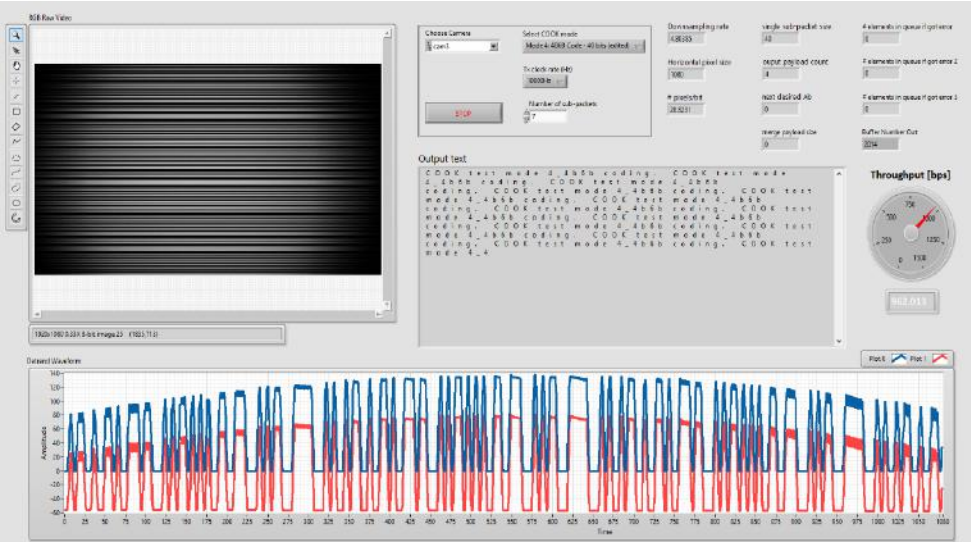
Technical Documents for HA-QL System (Link for more details):

Modes within IEEE 802.15.7-2018 | Our online HA-QL post

C-OOK Code Project [View Online]

C-OOK stands for Camera- On Off Keying, a communication mode within the **IEEE 802.15.7-2018** Optical Wireless Communication standard. Particularly, C-OOK is within the PHY V layer of IEEE 802.15.7-2018 standard, which was just recently released in April 2019.

Our **C-OOK Code** implements ALL **four OOK modes** within the IEEE standard.



Package 1: B2B link

Package 2: Simulation

Package 3: Optical Link

Advanced technical features of the code project

Our C-OOK code project is deployed following the release technical specification of C-OOK in the IEEE 802.15.7-2018 standard.

We provide three-in-one package:

1. **Back-to-back package:** Users can run the package without the requirement of hardware, real-time monitoring the behavior of both TX and RX.
2. **BER-SNR Simulation package**: which gives the simulation of C-OOK system under AWGN and the simulation of C-OOK system implemented with different bit detection methods.
3. **Optical link package**: which can be used for different types of LEDs and rolling shutter camera.

All these three packets will be delivered to you to test both cases: back-to-back link (and simulation mode), and the practical optical link. With a single delivery, multi-benefits you will earn.

Technical Documents for C-OOK System (Link for more details):

C-OOK IEEE 802.15.7-2018	Our-published article