TSFP10G-80(C,I,H)

SFP+, DWDM Tunable, C-Band (ITU 13.5 – 61), 10G, 80km, SMF/LC, DDM

PROGRAMMING AND WORKING WITH THE SFP TUNABLE MODULE

Zdenek SAMEK

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What is a Transceiver?

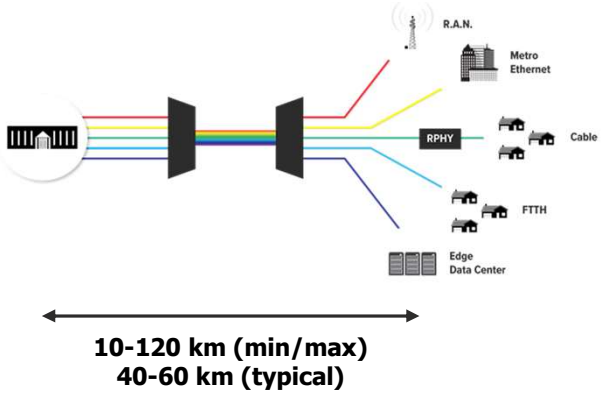
- A **Transceiver** is a small device that is plugged into networking equipment and can both transmit and receive data.

- **Optical Transceiver** → multi-chip module that converts electrical signals into optical signals (light pulses) and vice-versa for transmission on optical fiber.

- **Optical Transceivers** come in different shapes and sizes, called form factors. Which form factor to use depends on the type of data, speed and distance needed.
  - Form factors (SFP, SFP+, QSFP28, QSFP-DD, OSFP, **TSFP** etc.)
  - Media types (DAC/AOC/AEC, Copper RJ45, Optics)
  - Data rates (10M to 1.6T)
  - Distances (10m to 1000km+)
  - Temperature ratings (from 0 / +70°C to -40° / +95°C)

Access Network Solutions

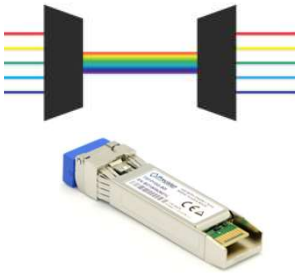
- Access networks → "last mile" of connectivity
- Long links, up to 160km
- Many variables: amplification, MUX/DEMUX, limited fiber.



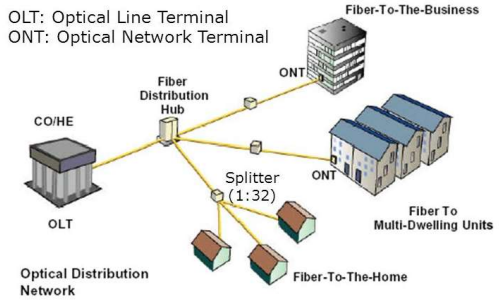
Common transceiver types for Access Networks include:

BiDi

CWDM/DWDM



PON

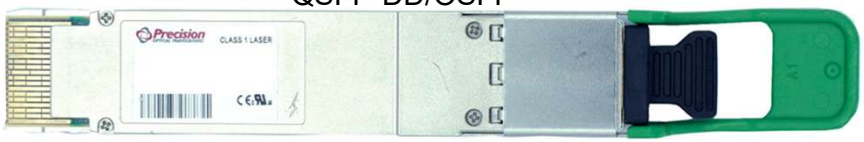


Transceiver form factors – From The Outside

SFP/SFP+/SFP28 + **TSFP**

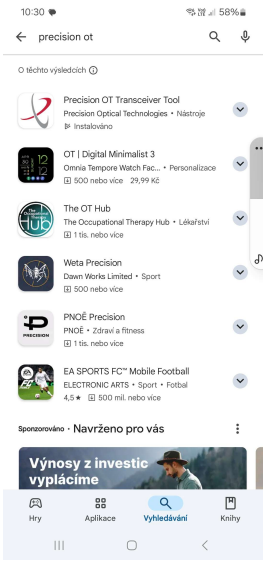
QSFP+/QSFP28

QSFP-DD/OSFP



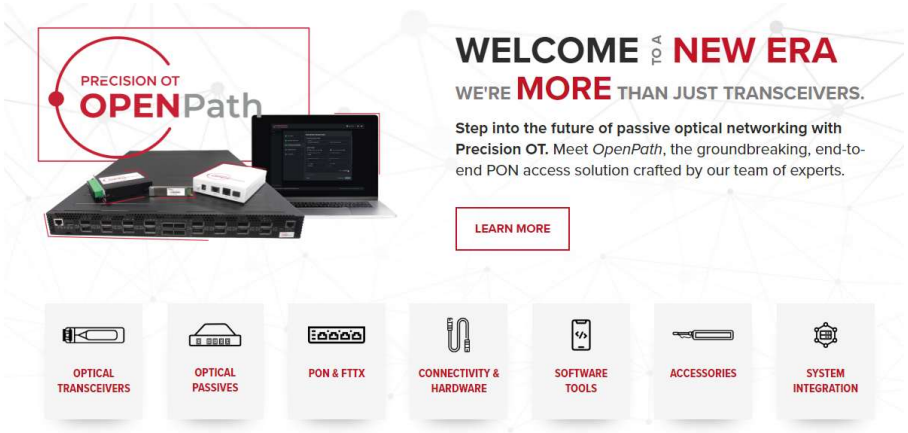
How to work with **TSFP**

First we download and install the software from Precision - BELDEN website – **register first !**
[Precision Optical Technologies | Optical Networking Equipment]
Or from the APP SW to IPhone via APP store, Android via APP Play, Desktop SW – via Precision web



Android APP

IPhone APP

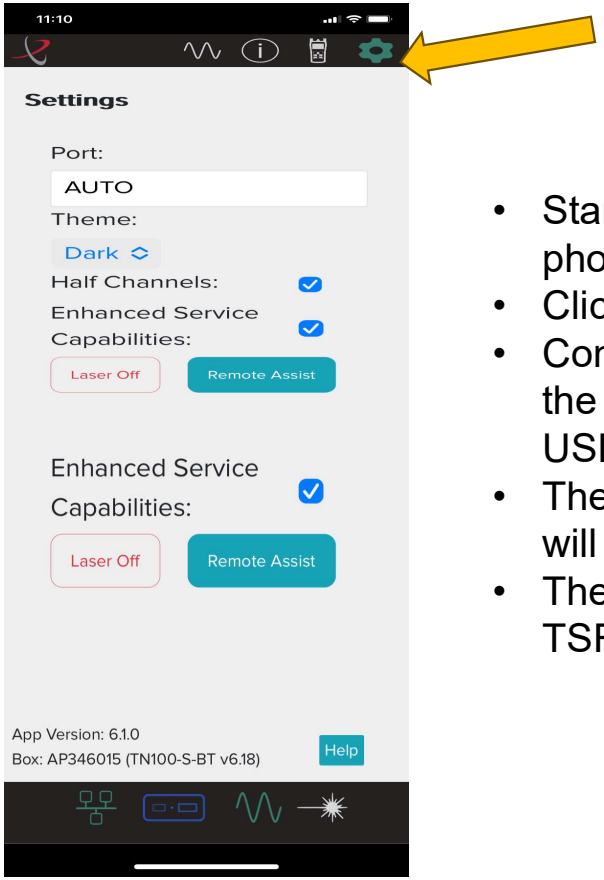


Precision SW

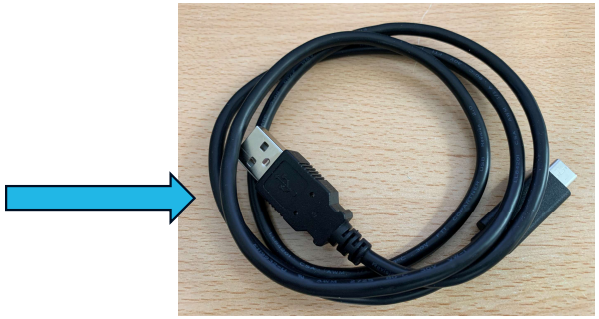
How to work with **TSFP** programing kit

- After registering on the website, it is possible to freely download software and other information, including manuals and datasheets for individual products.
- Downloads for **IPhone** and **ANDROID** are free on the APP platform
- The following demonstration and pictures of working with **TSFP** is done on the **IPhone** platform.
- The kit includes a ***tuning unit***, ***cable***, ***battery*** and ***15dB attenuation cell*** for testing the receiver in TSFP

How to work with **TSFP** programing kit



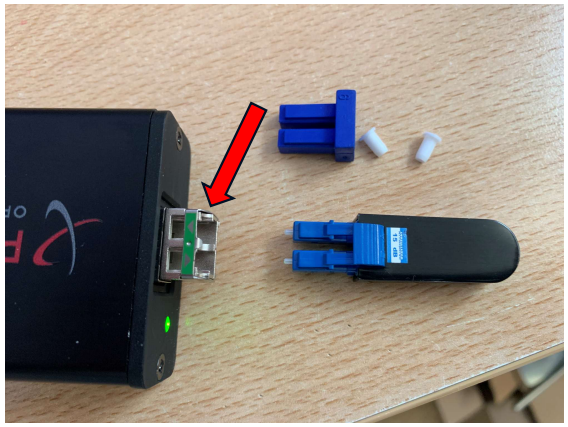
- Start APP PRECISION OT in the phone
- Click on settings - **yellow arrow**
- Connect the programming unit to the battery using a USB-A to USB-C cable – **blue arrow**
- The purple LEDs on the battery will light up – **red arrow**
- The unit is ready to insert the TSFP module included in the KIT



How to work with **TSFP** programing kit

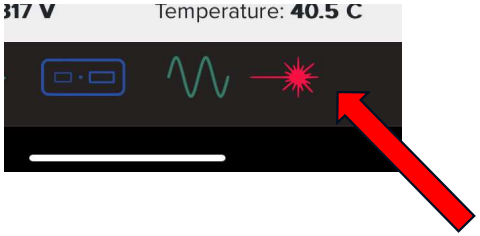
Insert TSFP in to the unit
Click on the green **I in the circle**.
It is a page with information about the inserted TSFP module.

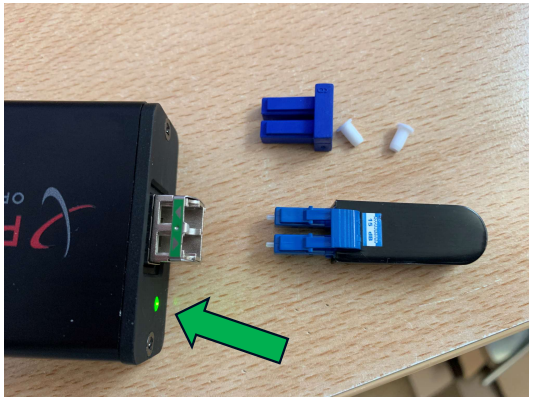
- ITU - channel number
- Frequency in THz
- Wavelength in nm
- The communication SW used, this is denoted by CISCO
- Product number
- Serial number

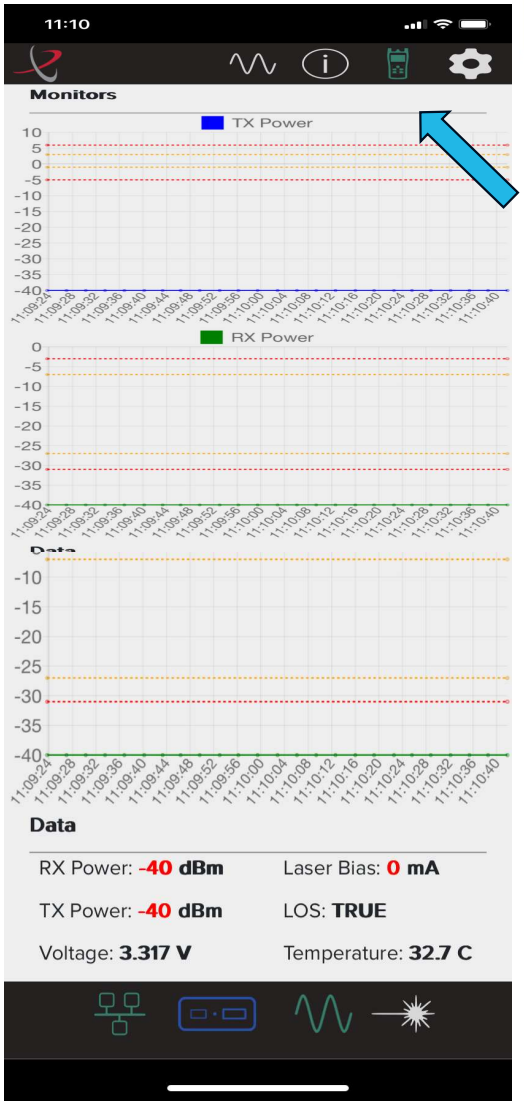


How to work with **TSFP** programing kit

- Inserted the **TSFP** module into the programming unit
- Click on the **device icon**
- The **green LED** of the module lead shaft is green
- In the TX power and RX power diagrams we can see zero level of transmitted and received signal
- Click on the LASER icon to change the color from white **to red**



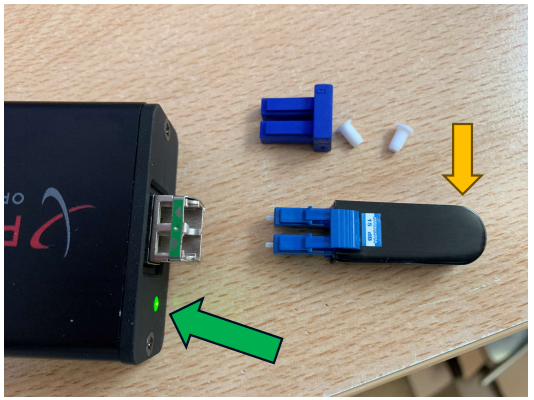


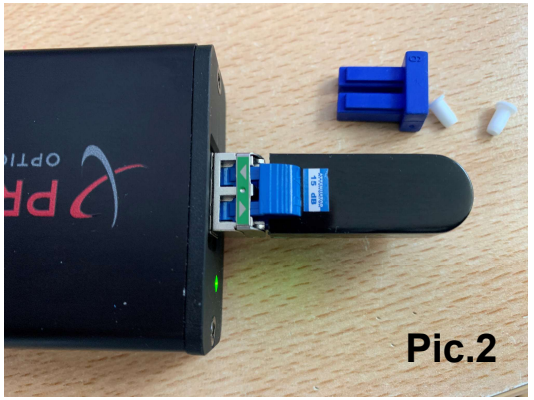


How to work with **TSFP** programing kit

- The **green LED** of the module lead shaft is green
- Prepare the **15dB** attenuator – **yellow arrow**
- Remember to use a cleaning tool to clean the ferrules of the connector in the **TSFP** and on the **attenuator**
- Insert the attenuator into the TSFP module until a distinct click is heard, just like when using dual LC connectors. **Pic.2**

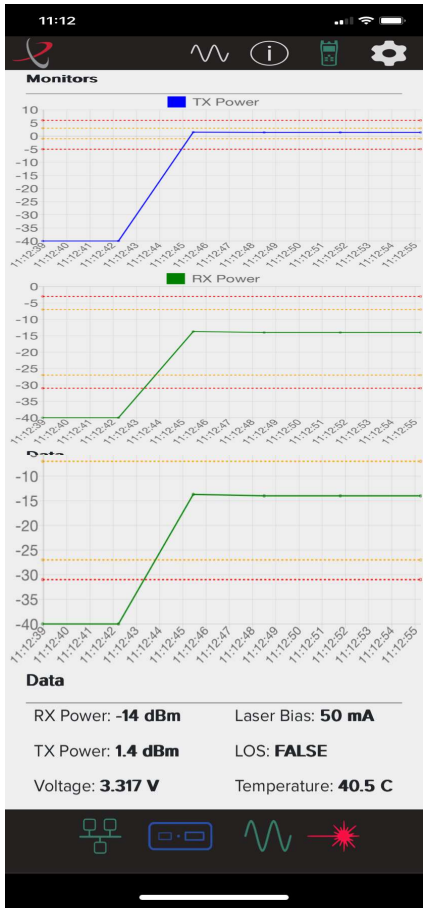
Cleaning tool LC connectors





Pic.2

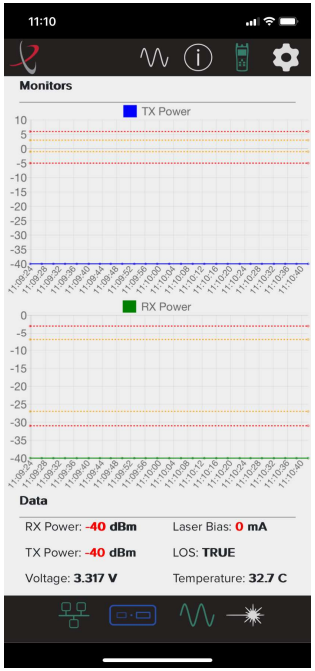
How to work with **TSFP** programing kit



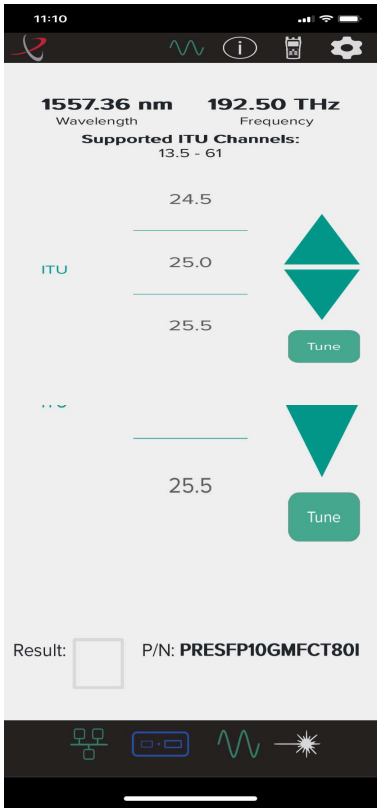
When the laser is on, **the red laser icon** is lit at the bottom

- **TX power** graph shows the power value in dBm
- **RX power** graph will show the value of the transmitted signal (blue graph) **-15dB** attenuator and the green graph will show us what the laser power is at the RX input diode.
- We can also see all the values in numerical form at the **bottom of the screen**
- The graphs have the standard values marked with a yellow dashed line and the limit values with a red dashed line.

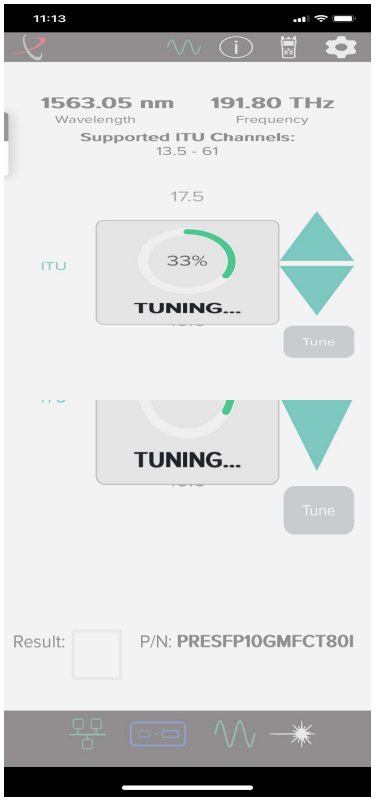
How to tune **TSFP**



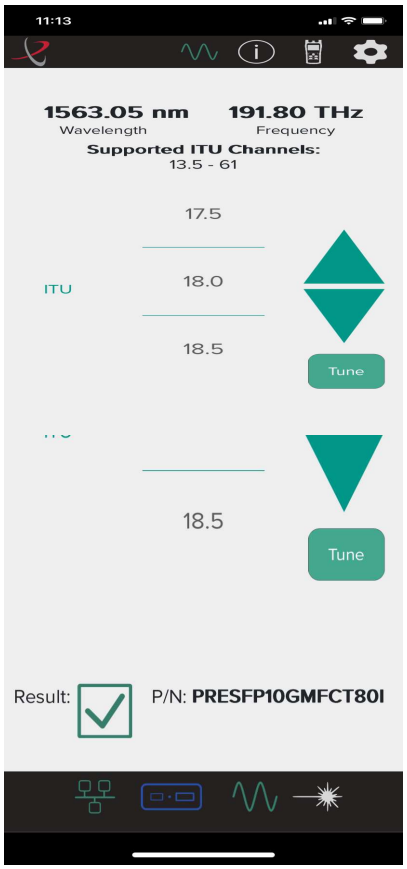
- Turn **off laser**, red icon turns white
- Go to the channel tuning page, indicated by the green sine wave in the top bar
- Green ITU indicates the channel number that is tuned and in use
- If we want to change the channel, we make this change with the arrows on the right side of the screen, up to down.



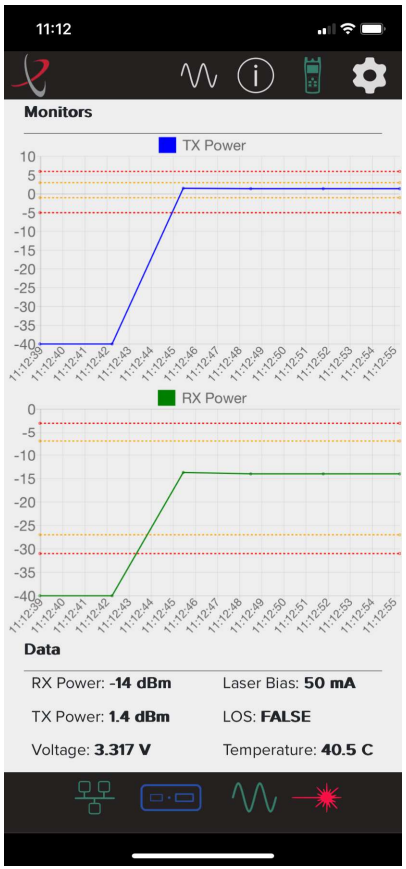
- Select channel **18**
- Click on the **TUNE** button
- Let the tuning process run its course



How to tune **TSFP**



- When the debugging is finished, we will see the new values
- ITU shows the newly tuned channel 18
- Click on the **green I** in the top bar and check the parameters
- After switching on the **laser**, the TX and RX values appear again, this time for channel 18



How to work with **TSFP** programing kit

- When the tuning is finished, turn off the laser
- Remove the attenuator from the TSFP module
- Put the dust caps of the LC connectors on the attenuator module
- Insert the rubber dust cap into the TSFP module
- Remove the TSFP from the programming module and install it into the desired technology.

Thank You

Q&A