santec

Sample Software Manual

Full-Band Swept Test System IL measurement

03-Jan-2023

1. Overview of Project

This is an example software of a scan test system for full-band IL measurement.

- Development environment Visual Studio 2015
- Windows Framework 4.0 or later
- Instrument DLL 2.5.1
- STSProcess.DLL 2.2.2
- NI DLL 15.5 or later

2. Configuration

(1) Tunable laser TSL Series (TSL-550/TSL-710/TSL-570)

(2) Power meter MPM Series (MPM-210/210H/211/212/213/215)

(3) Optical switch OSU series (OSU-100/OSU-110)

This sample software allows you to control up to two MPM main frames (MPM-210 or MPM-210H).

3. Connection setting

Tunable laser (TSL)control

TSL-550/710: GPIB

TSL-570:GPIB, TCP/IP or USB

*It can be changed on the source code, but the initial value is the delimiter CRLF specification.

Power meter (MPM) control

MPM-210/210H: GPIB or TCP/IP

Optical switch (OSU) control

OSU-100: USB

OSU-110: GPIB, TCP/IP or USB

Connection system (2 TSL connections, OSU-110)

Connect with BNC cable as shown in figure 1.

TSL-*** Trigger Output -> OSU-110 Trigger Input

OSU-110 Trigger Output-> MPM-*** Trigger Input

OSU-110 Power Monitor -> MPM-*** Power Monitor

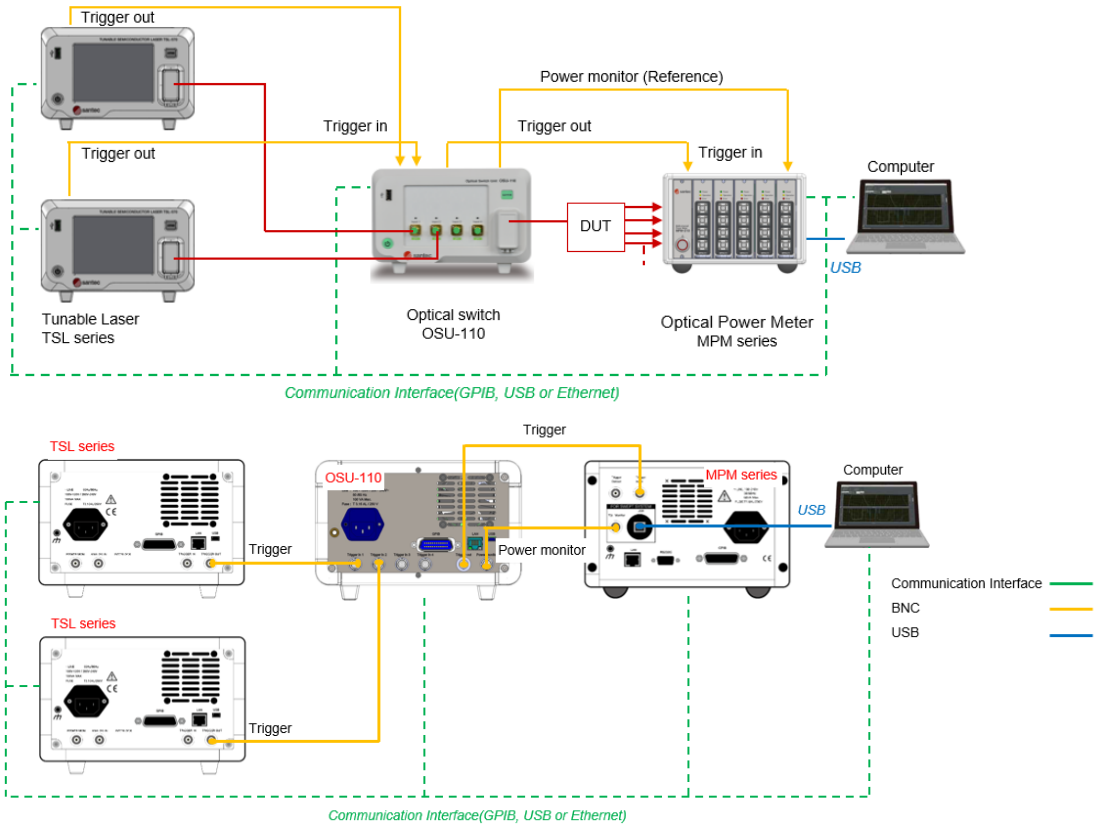


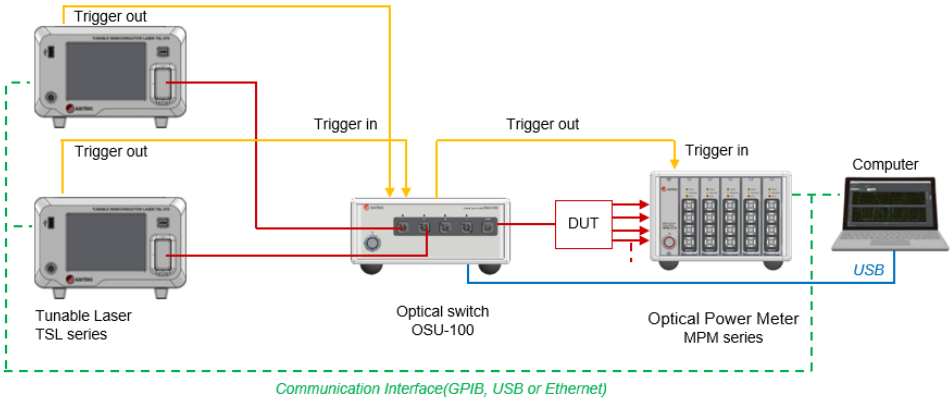
Figure 1. Connection system (two TSL connections, OSU-110)

Connection system (2 TSL connections, OSU-100)

Connect with BNC cable as shown in figure 2.

TSL-***Trigger Output-> OSU-***Trigger Input

OSU -***Power Monitor-> MPM-***Trigger Input



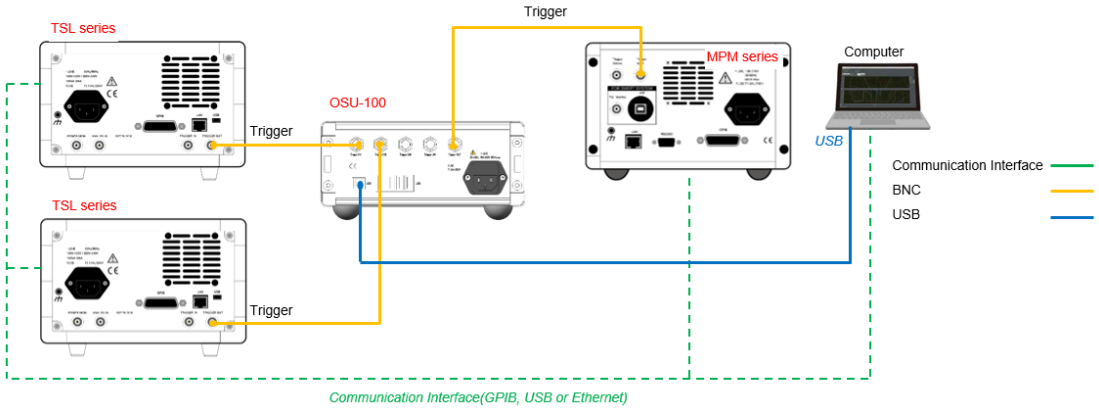


Figure 2. Connection system (two TSL connections, OSU-100)

4. Operational steps

1) Instrument settingscreen(TSL Tab)

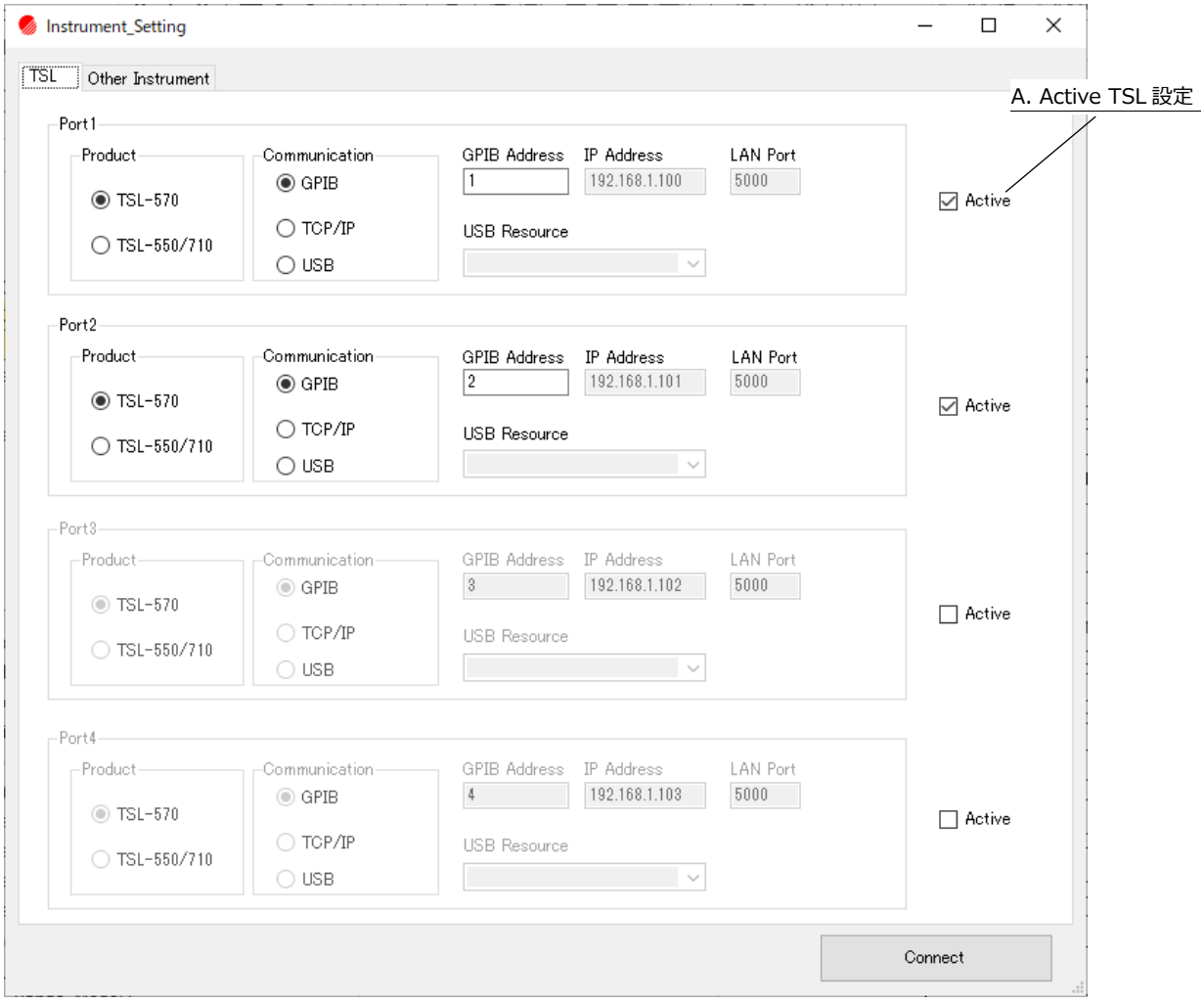


Figure 3. Instrument setting screen

2) Function – Instrument setting(TSL Tab)

The screen is called from the Main Form at Staring Up. Expand the settings for each instrument to the Main Form.

1. Form Load

   Receives the device number of the SPU (DAQ) and the USB resource (when the TSL interface is USB) connected to the PC from the Main Form and displays it in each Comb box.

2. TSL

   Displays the communication setting information of the TSL. The Active option on the left determines whether to add this TSL, which can support up to four connected machines.

   The Port corresponds to the Port of OSU.

3) Instrument setting screen (OSU&MPM TAB)

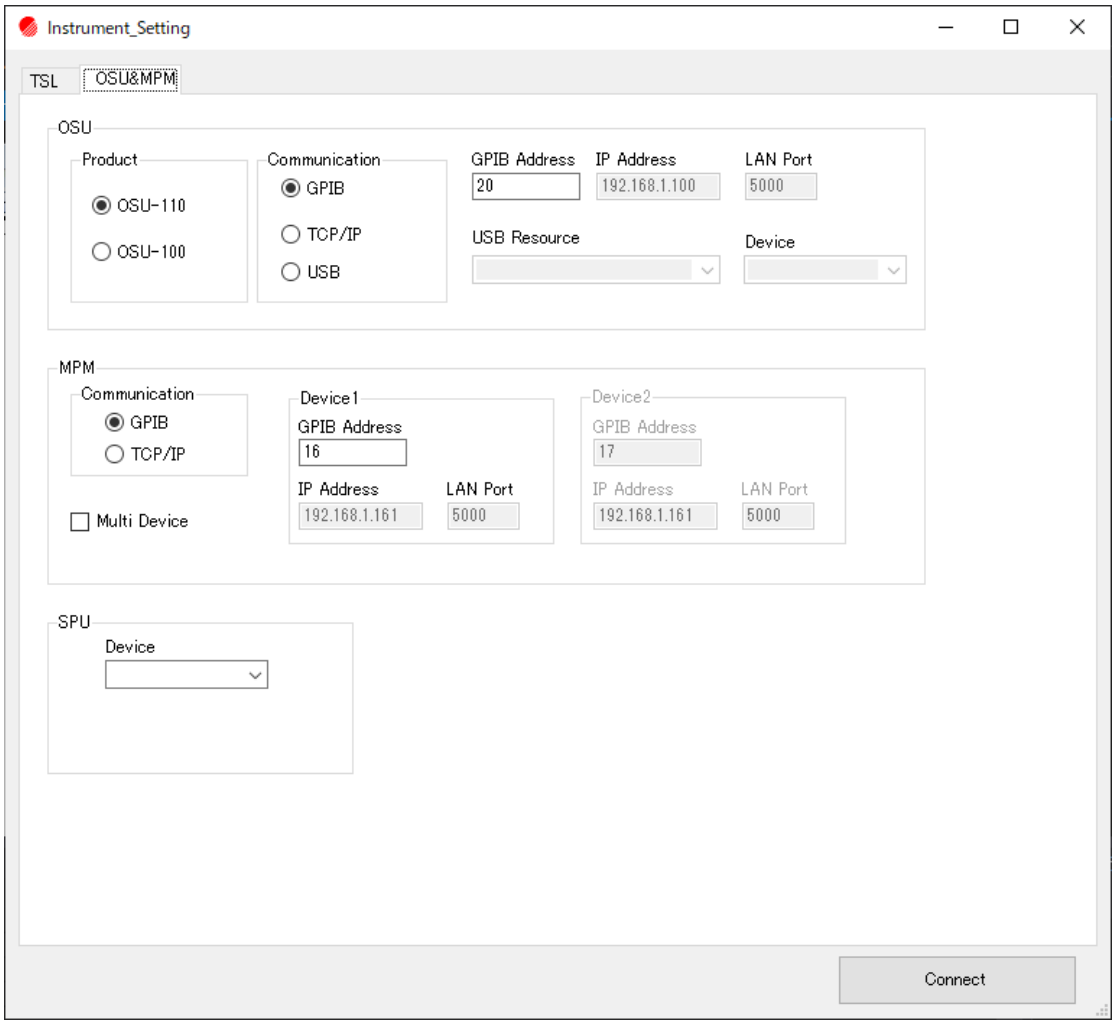


Figure 4. Instrument setting screen (OSU&MPM TAB)

4) Function - Instrument setting (OSU&MPM TAB)

It is displayed by selecting OSU&MPM TAB on Instrument setting screen.

Expand the Settings for each instrument in the Main Form.

1. Form Load

   At Start UP, it checks the device number of the SPU (DAQ) connected from the Main Form to the PC, the USB Resource (if OSU's interface is USB), and displays it on each Comb box.

2. OSU

   Show OSU's communication Settings

3. MPM

   Display MPM communication Settings information

   Up to two cars can be used.

4. SPU

   Displaying SPU (DAQ) device Numbers.If OSU-100 is selected, it is identical to the device number selected in OSU-100.

5. Connect

   After setting each instrument in fig.3 and fig.4, press the "Connect" button to display the Full-Band STS IL sample software screen in fig.5. Full-band STS IL sample software the connection information of each instrument is transmitted to the class of each instrument when the screen is displayed.

5) Full-Band STS IL sample software screen (TSL Parameter TAB)

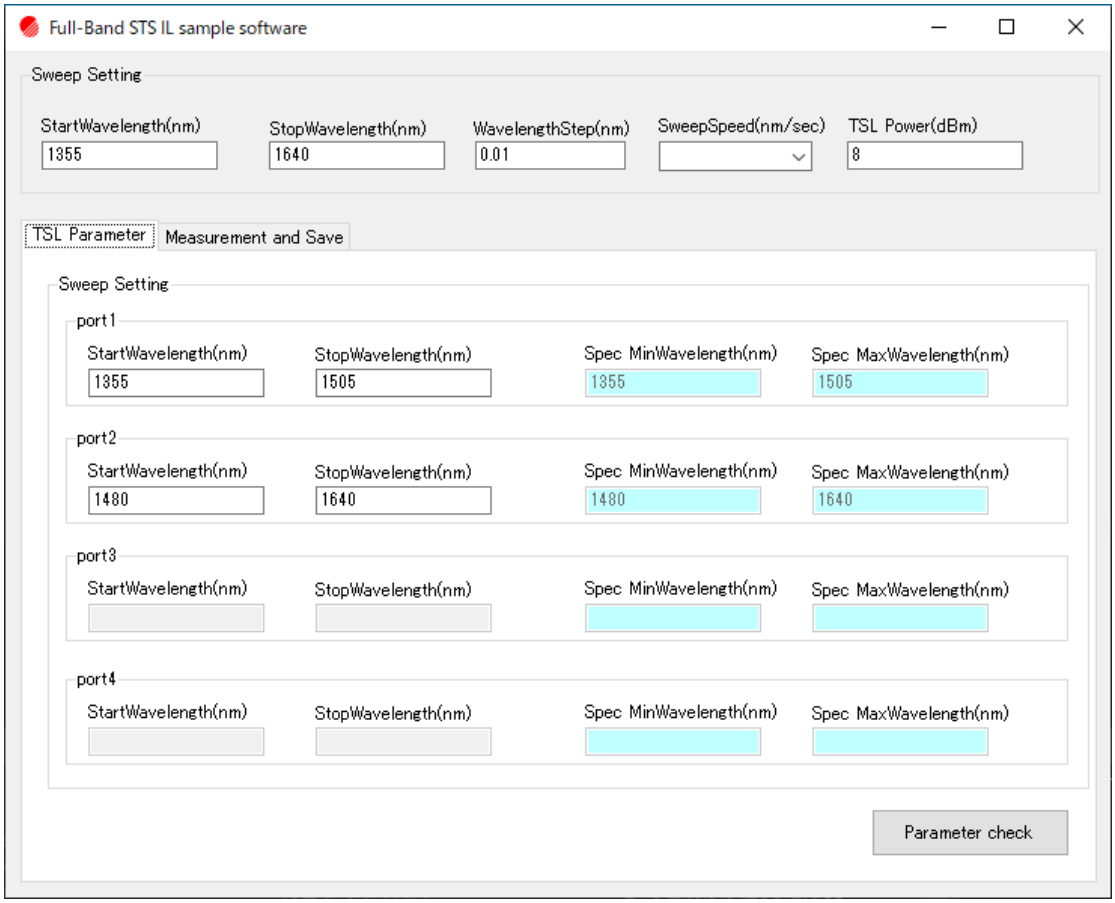


Figure 5. Full-band STS IL sample software screen (TSL Parameter TAB)

6) How to use

1. Tunable laser setting

   Input the sweep condition in the Sweep Setting(A) frame.

   Start Wavelength (nm) Start wavelength

   Stop Wavelength (nm) Stop wavelength

   Wavelength Step (nm) Measurement data step

   Sweep Speed (nm/s) Sweep speed

   TSL Power (dBm) TSL output power

2. Wavelength variable light source setting (scan range of each TSL)

   Enter the Sweep range for each TSL in the Sweep Setting frame (B).

   Start Wavelength (nm) Start Wavelength

   Stop Wavelength (nm) Stop Wavelength

3. Confirmation of sweep conditions of TSL

   Confirm the sweep condition of TSL with Parameter check (C).

7) Full-Band STS IL sample software screen (Measurement and Save TAB)

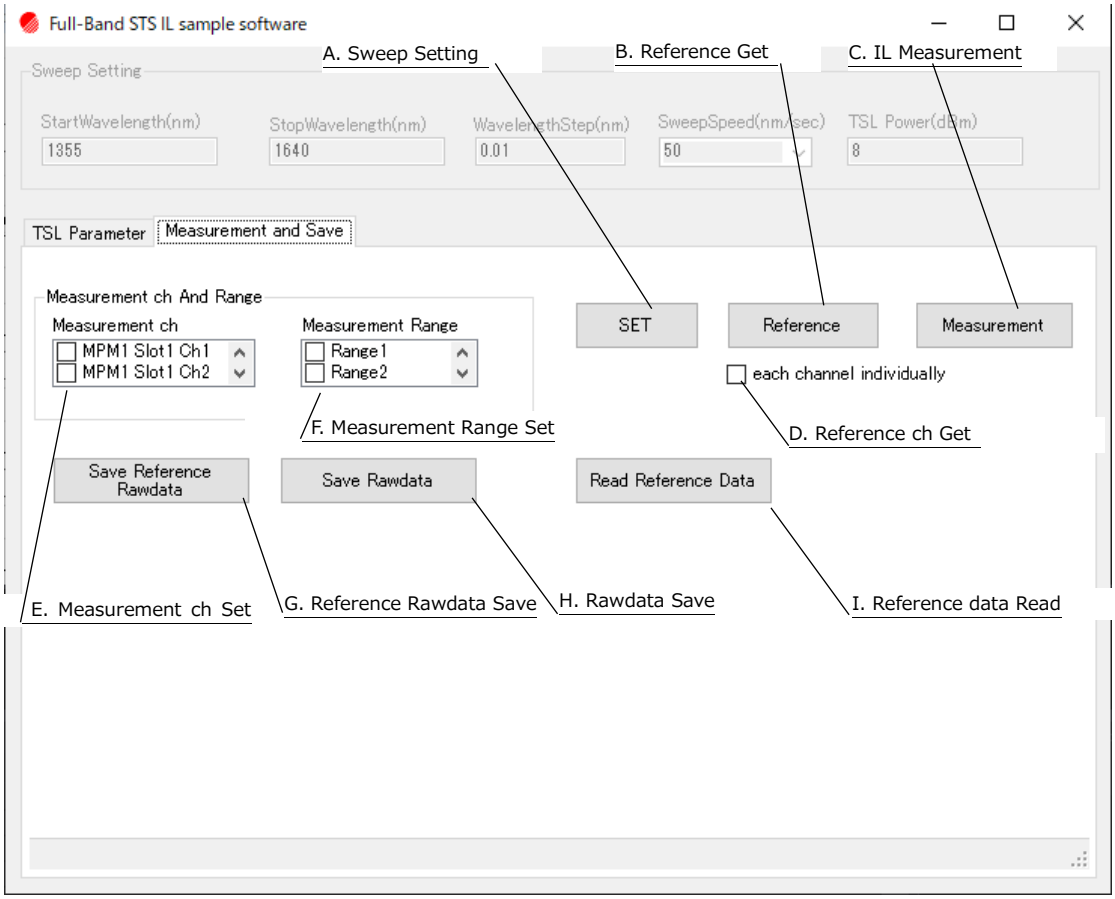


Figure 6.full-band STS IL sample software screen (Measurement and Save TAB)

8) How to use

1. Setting up your Power meter

Measurement ch And Range set Measurement ch (E) And Measurement Range (F) in the frame.

In Measurement ch (E), you can set the Channel of the Power meter Module. Multiple selection makes it possible to measure multiple objects (duts) at the same time.

Measurement Range (F) sets the Range of each sweep. When multiple selections are made, high dynamic range measurement becomes possible when the dynamic range of the measurement object (DUT) is more than 40dB. Although it depends on the type of Module, the dynamic range measurement of about 40db per sweep is possible.

Setting example)

The dynamic Range of the DUT is 60db, and the output power of the light source is 8dbm. When connecting the DUT directly without inserting the splitter between the light source and the power meter, the number of

Range: 2

1st Range: Range 1

2nd Range: Range 4

2. Parameters set for each measuring device are reflected to the equipment

   Pressing the SET (A) button will apply the parameters to the device. Pass the set parameters to each instrument class and STS Process class.

   The STS Data Struct, which is necessary for Data retention in the STS Process class, is also set here.

3. Get Reference data

   When you press Reference (B), you get the Reference data with the conditions set in 1 and 2. If multiple Power meter ranges are set, the Reference will be obtained at the first Range.

   Please note that if you check "each channel individually(D)", you will receive a Reference for each channel individually.

4. Insertion Loss measurement

   When Measurement (C) is pressed, Insertion loss (IL) is measured under the condition set in 1 and 2. When multiple Power meter ranges are set, Sweep processing is performed with the set number of ranges, and data synthesis is performed in the STS Process class. The IL data is then calculated and output as a file. For more information about Sweep processing, see 9).

5. Reference save Rawdata

   Save Reference Rawdata (G) will read the data measured by Reference (B) from the STS Process class. The saved data is saved in CSV format to the specified path.

6. Save Rawdata

   Save Rawdata (H) will read the data measured by Measurement (C) from the STS Process class. The saved data is saved in CSV format to the specified path.

7. Reference data

   By pressing Read Reference Data (I), the Reference Data saved in step 5 is Read and passed to the STS Process class.

9) Sweep processing

1. Switch OSU port.
2. Set the Sweep condition in TSL.
3. Set the Logging condition on MPM.
4. Set the Logging condition on the SPU.
5. Set the measurement start wavelength of TSL and the range of MPM.
6. Start Sweep of TSL and put it in the state waiting for the software trigger.
7. Start logging the MPM.
8. Start logging the SPU.
9. Issue a software trigger for TSL.
10. Wait for the end of logging of SPU, MPM,.
11. Wait for Sweep to finish TSL.
12. Set TSL to the starting wavelength.
13. Measurement Data is read from MPM or SPU and passed to STS Process class with STS Data Struct.
14. The data is processed in the STS Process class.
    *When multiple measurement ranges are set, it is possible to perform data processing at once.

When sweeping multiple times (acquiring multiple ranges), after performing process 9, check the busy status of TSL and then repeat from process 1.
If multiple TSLS are connected, repeat from processing 1 after performing the above processing.