Optical Device Measurement & Analysis System

User's Manual

www.neonphotonics.com

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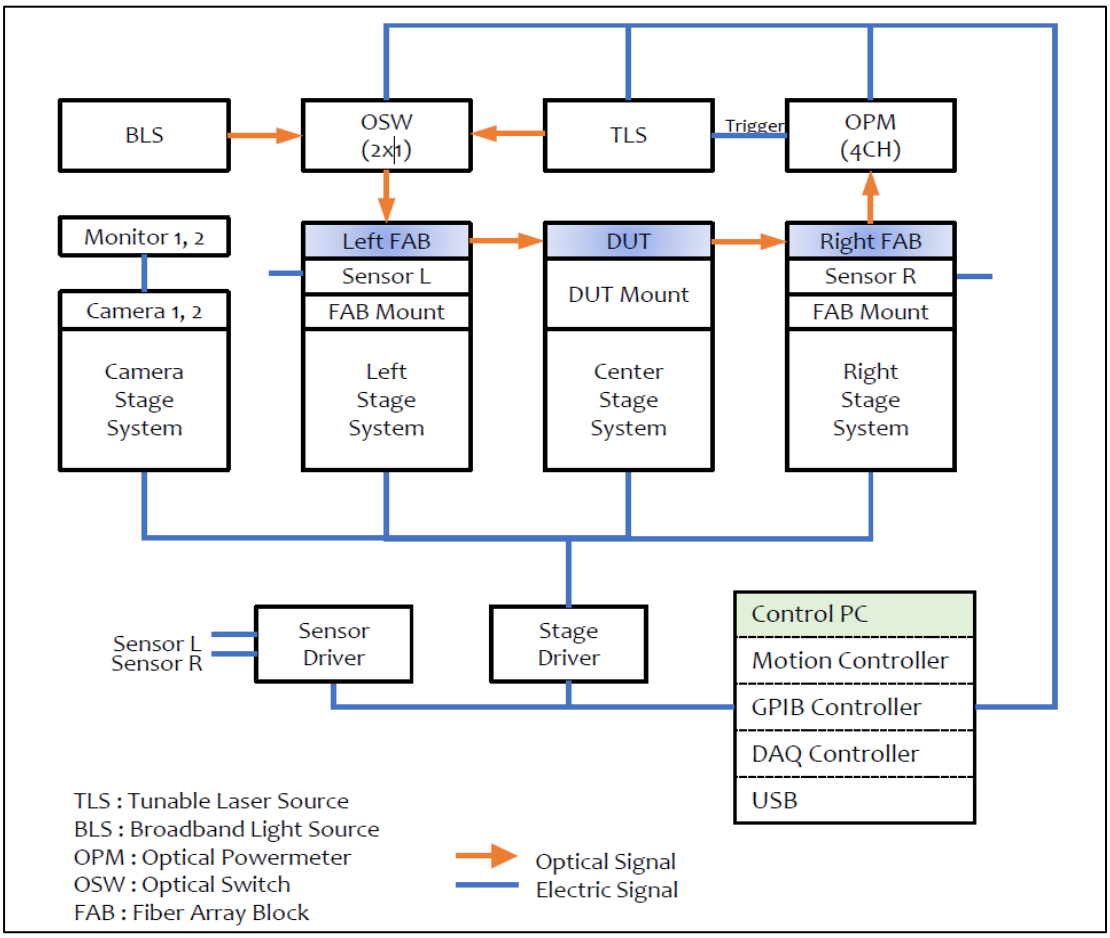
1. General Information

A. Purpose of System

i. To Measure the optical properties if the PLC element by aligning the PLC(Planer Lightwave Circuit) and FAB(fiber Array Block)

ii. To Measure O-Band 4 channel CWDM Mux & DeMux chip

iii. To Measure O-Band 4 channel DWDM Chip

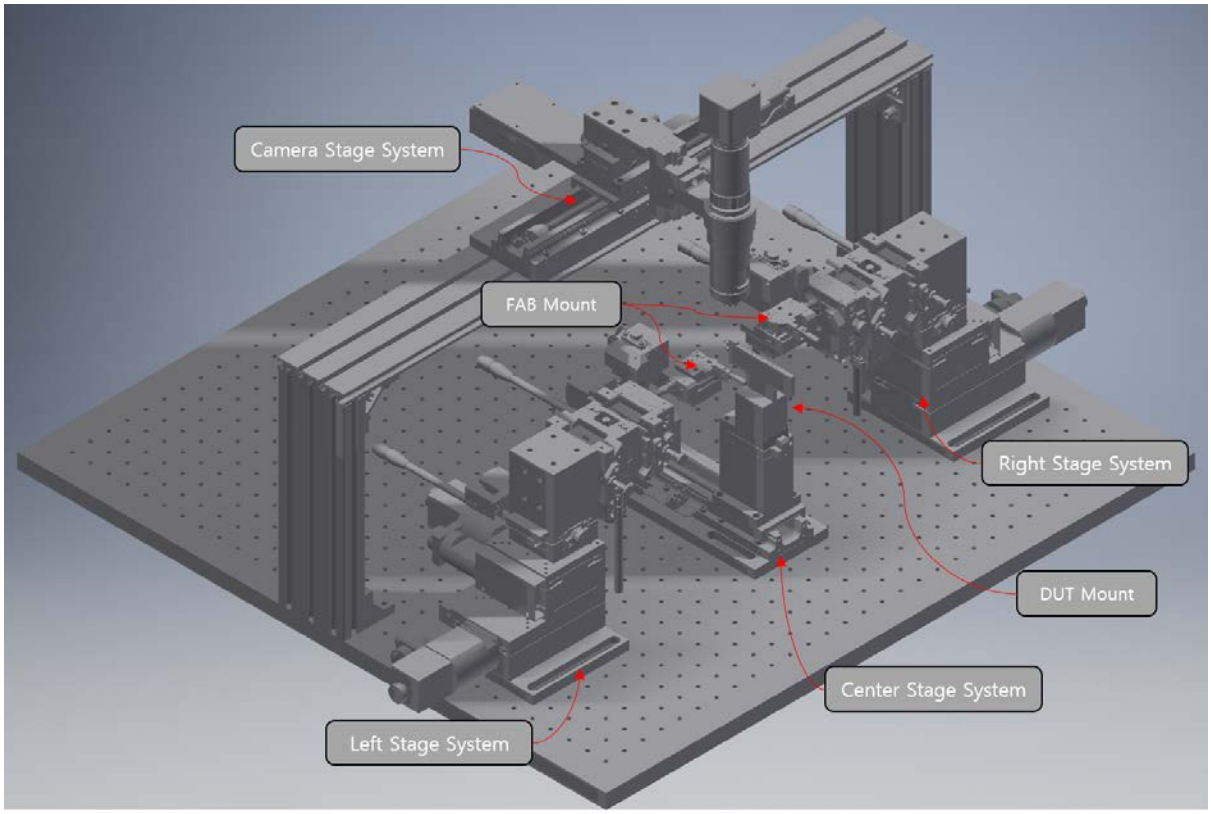


2. Outline of System

This is a schematic of the Optical Device Measurement & Analysis System.

BLS source for optical alignment of PLC chip and FAB, and TLS Source for measuring PLC chip are configured and he two sources are connected to the optical switch and adjusted for each situation between measurements.

A 4ch power meter for optical measurement is configured to receive a trigger signal from TLS and to synchronize the chip measurements.

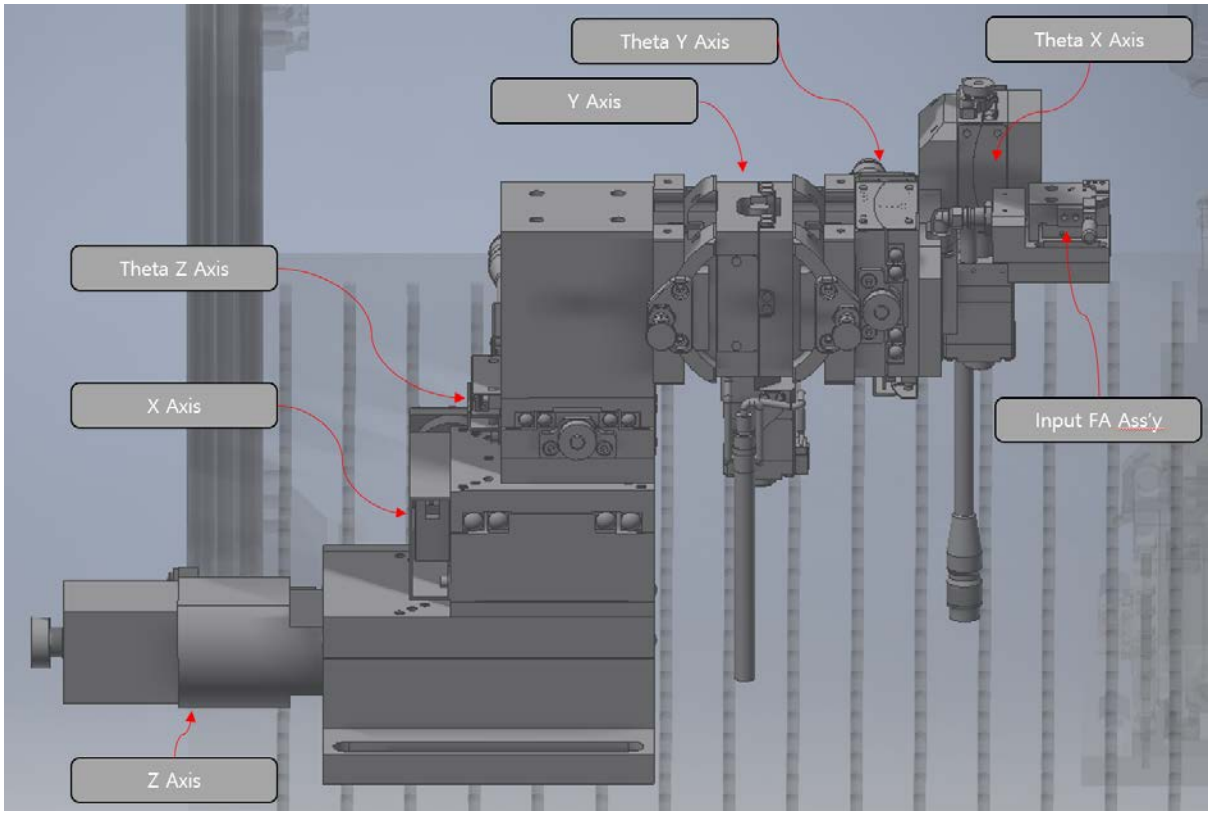


Stage Parts of Optical Device Measurement & Analysis System

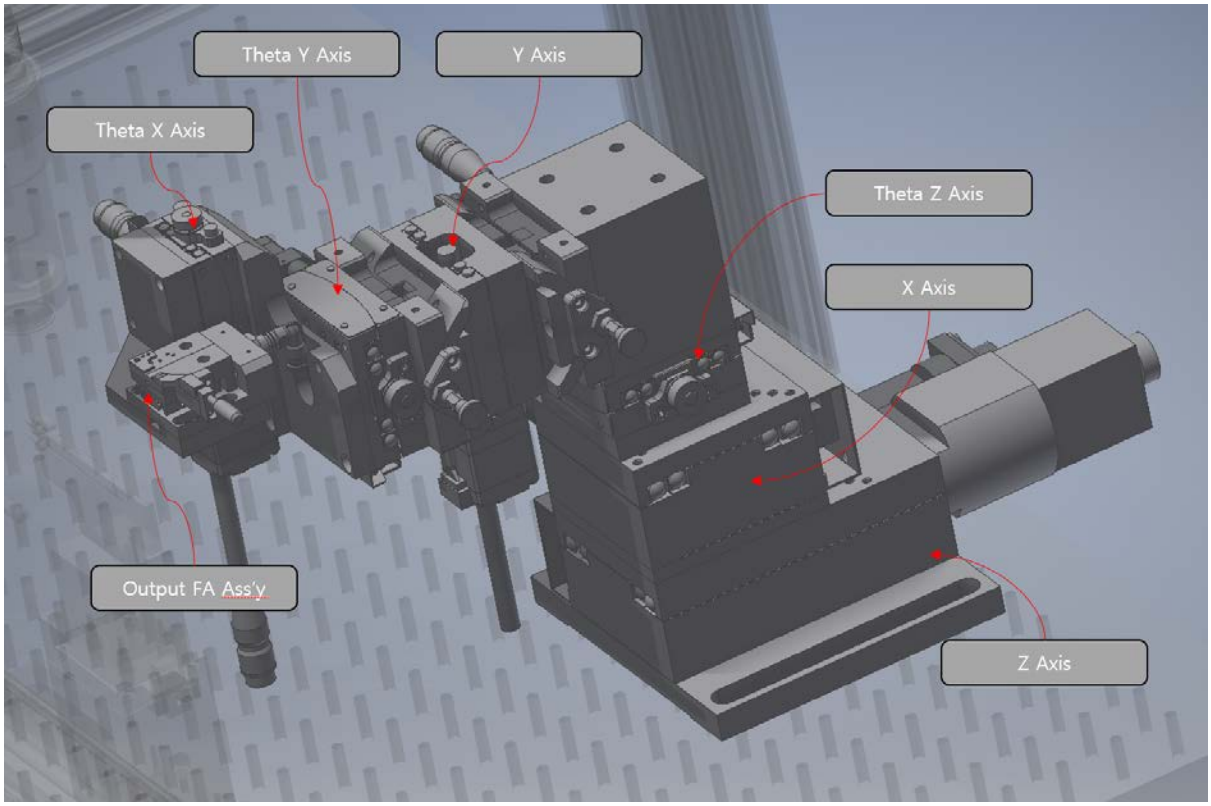
2.1 Section 1 – Stage Parts

Stage Parts

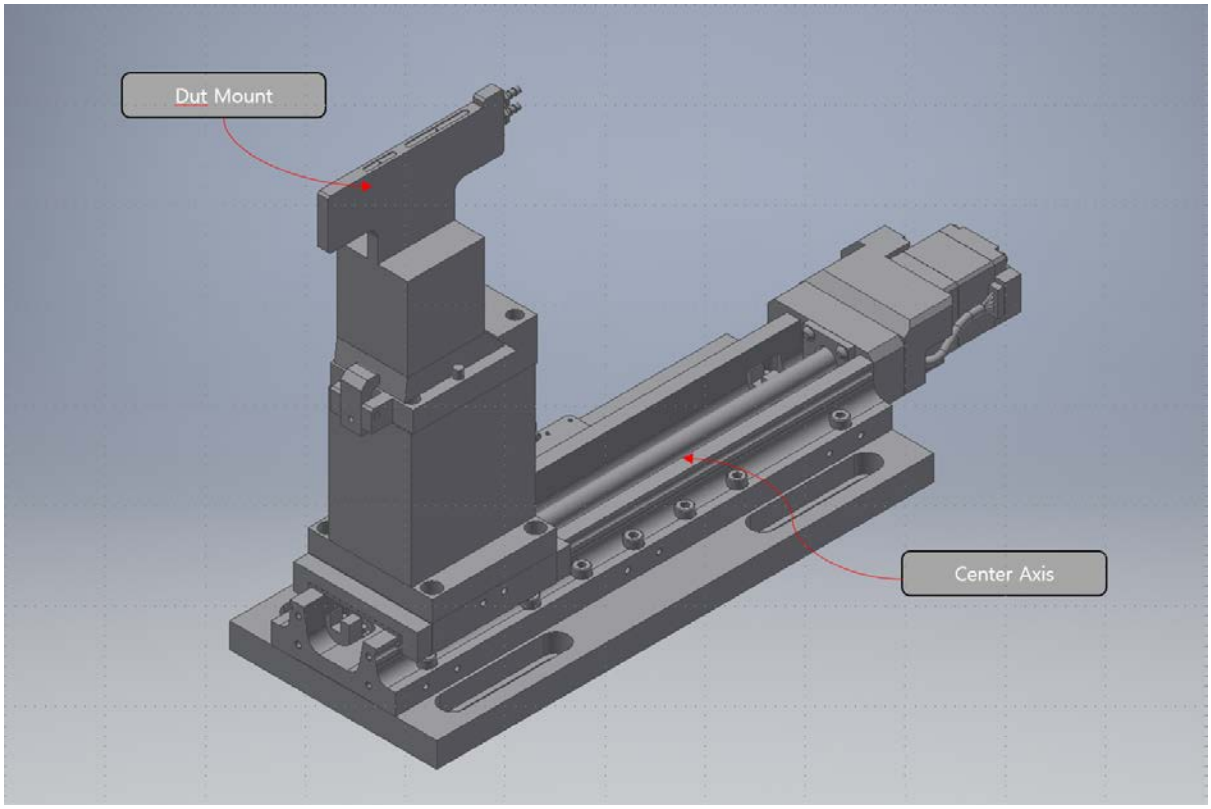
Parts Name	Description
Left Stage	6 Axis (X,Y,Z,TX,TY,TZ) Motorized Stage X,Y,Z Stage : 0.05㎛ TX,TY,TZ Stage : 0.0032 degree
Right Stage	6 Axis (X,Y,Z,TX,TY,TZ) Motorized Stage X,Y,Z Stage : 0.05㎛ TX,TY,TZ Stage : 0.0032 degree
Center Stage	1 Axis Motorized Stage 1㎛
Camera Stage	1 Axis Motorized Stage 1㎛



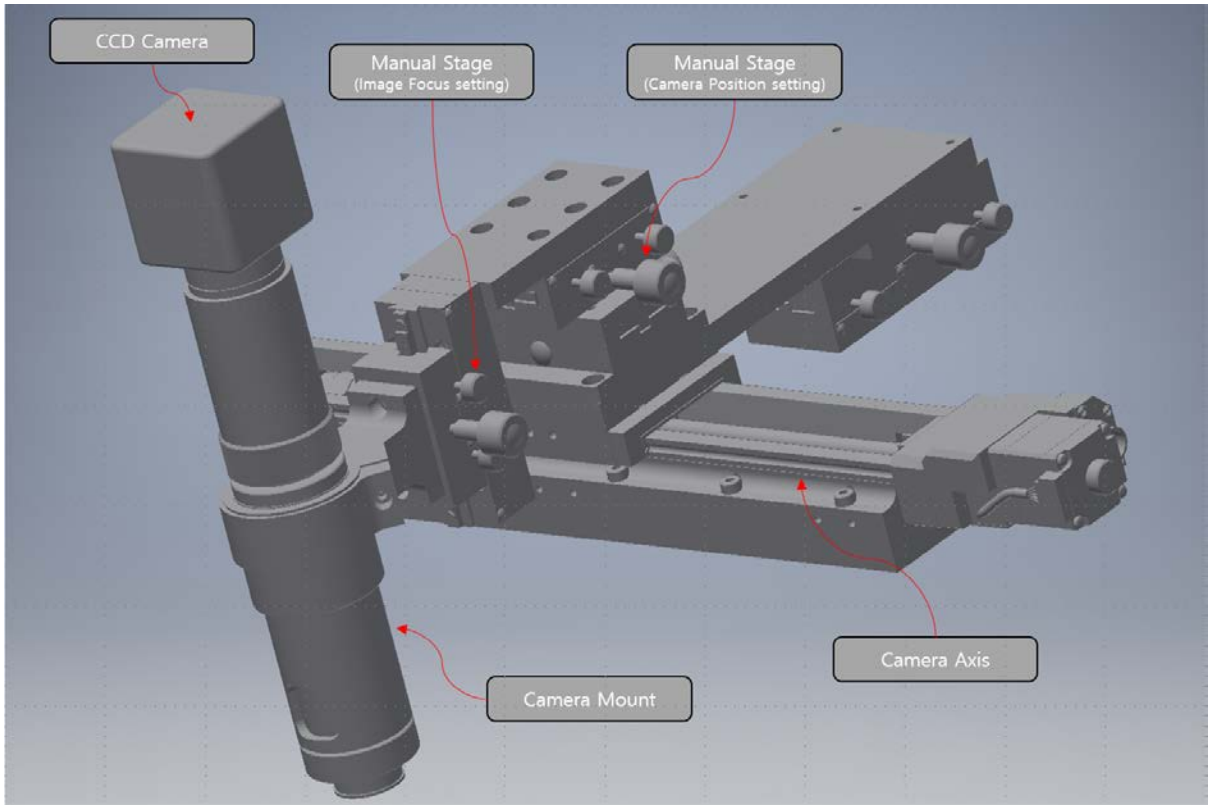
<Left Stage schematic >



<Right Stage schematic >



<Center Stage schematic >



<Camera Stage schematic >

2.2 Section 3 – Instrument Part

Alignment Source for optical alignment of DUP chip

1. Output power control lever of each wavelength. (Fixed at all times after initial setting)
2. On/Off button for each wavelength.
3. Output Connector [FC/APC]

2.2.2 Optical Switch

Optical switch for output switching of Source 'TLS' for measurement and Source 'Broadband' for optical alignment.

Control the switch inside of the measurement program (Form – refer the Optical Source Controller)

Instrument Part

Part Name	Description
Tunable Laser Source	Refer to Agilent 8164B User's Manual
Broadband Light Source	Alignment source
Optical Powermeter	Refer to Agilent N7744A User's Manual
Optical Switch (2x1)	Optical switch (switch TLS and BLS)
Fiber Array Block	

2.3 Section 4 – user Interface Part

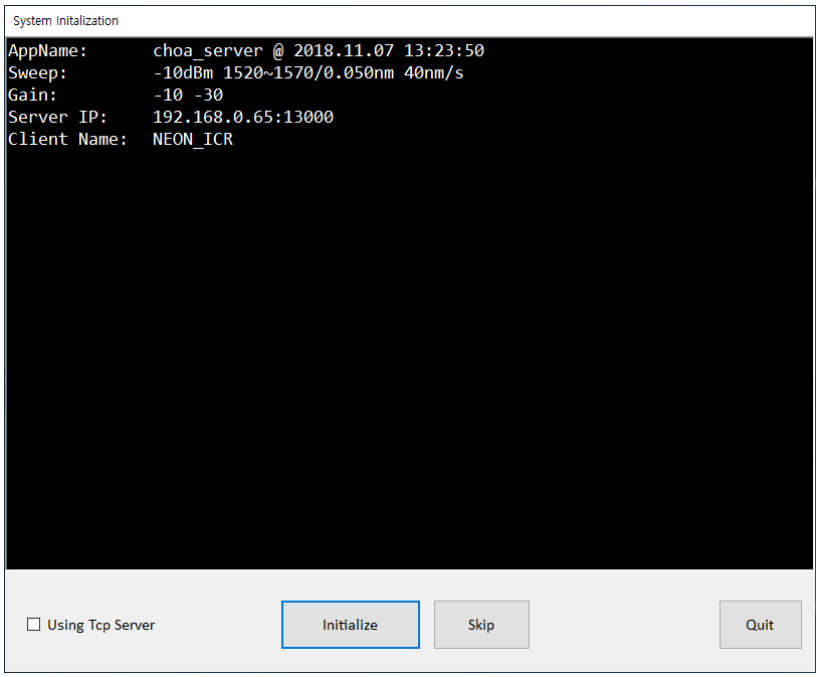
Part Name	Description
Data Analysis Part	Refer the Chapter 3
Component Control Part	Refer the Chapter 3
Stage Control Part	Refer the Chapter 3
Measurement Part	Refer the Chapter 3

2.4 Equipment Installation Environment Specifications

Equipment Installation Specifications.

		Spec		Remark
Power	Body	2-Phase 220V ±10%	2200 VA	50aHz / 60Hz
Pneumatic	Pneumatic	6Kgf / ㎠	Φ6 Tube	
	Vacuum		Φ4 Tube	
OTR	Main Machine: 20℃ ~ 30℃			
Net weight	Body	400Kg, 1150 x 850 x 1400		

3. Software - User Interface



2.2 Beginning of the program – System Initialization Form

Launching the UI of the Choa Server will show the same window as shown in (Figure 1).

When running the window to initialize the device, the information set in the Config file is displayed.

AppName : Information for the current program

Sweep : Sweep info, when measuring Dut

(TLS Power | start wave | stop wave | step | sweep speed)

Gain : Value of 'Gain' of powermeter when measuring Dut

Server IP : Address of TLS Tcp Server

Client Name : The name of current equipment.

Using Tcp Server : Check when using TLS with Tcp Server

Initialize : Check the status of each equipment & reset the system according to the set conditions

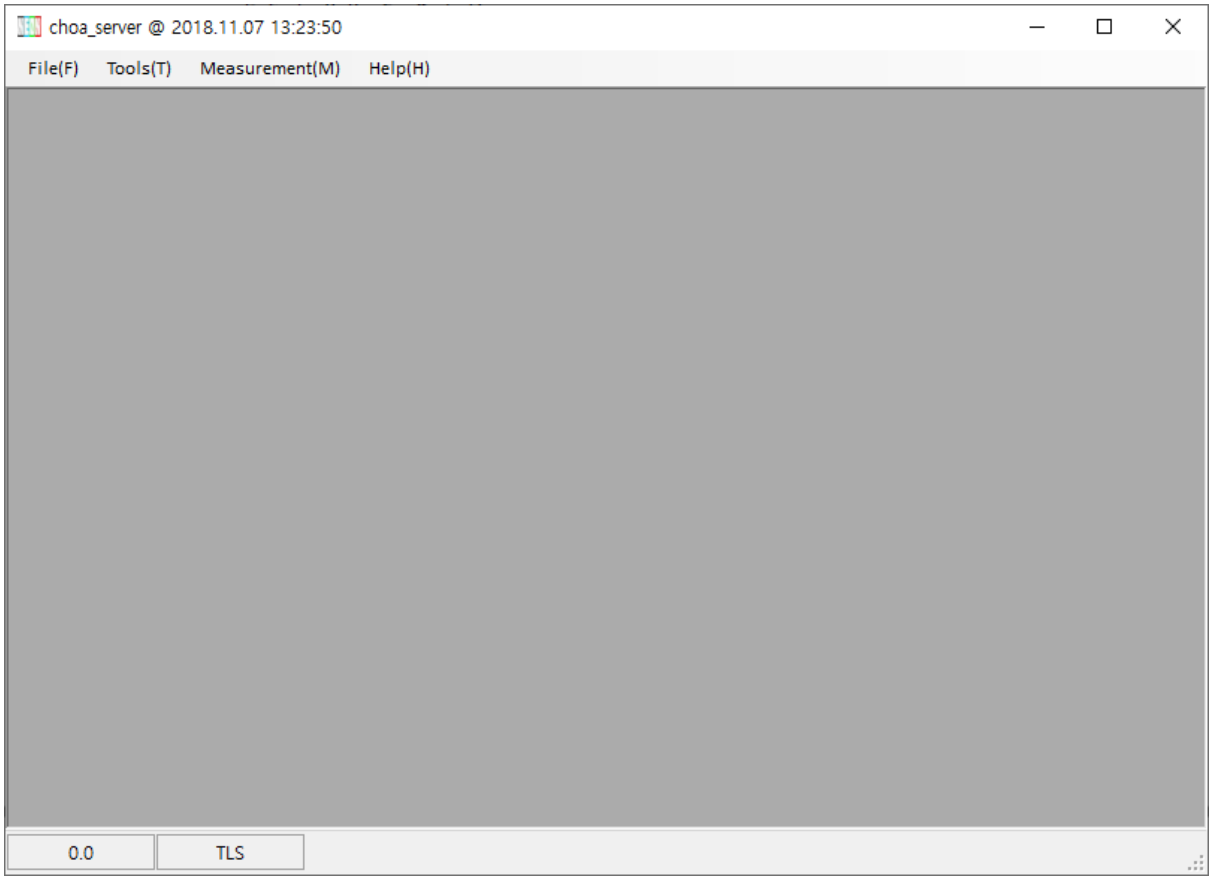
Skip : Without initializing the equipment, skip to the main form.

Quit : Quip the program

Select the check box according to the usage environment [Using Tcp Server] of TLS and click

Initialize button

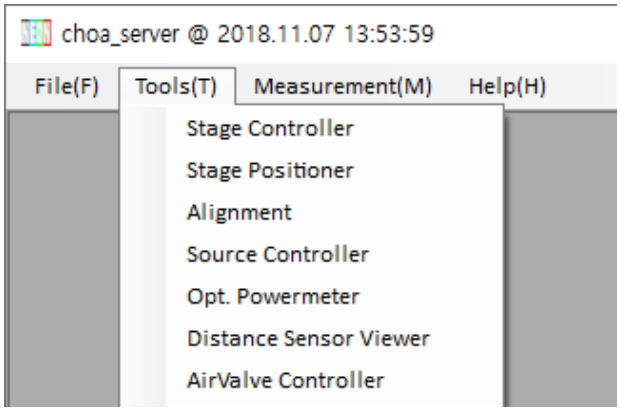
2.3 Main Form : Main form of program



Main form of Measurement program

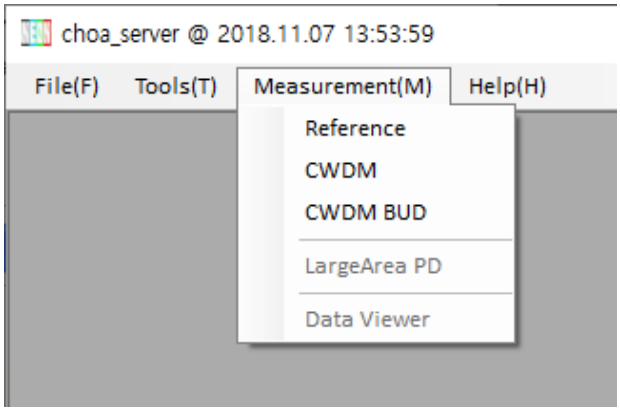
The machine's corresponding function operation Tool and measurement window of Dut chip can be opened.

Main Form Menu



Menu – Tools : Open windows that control each equipment in the measurement system.

When System Initial finishes, all of the windows for each item are automatically opened.

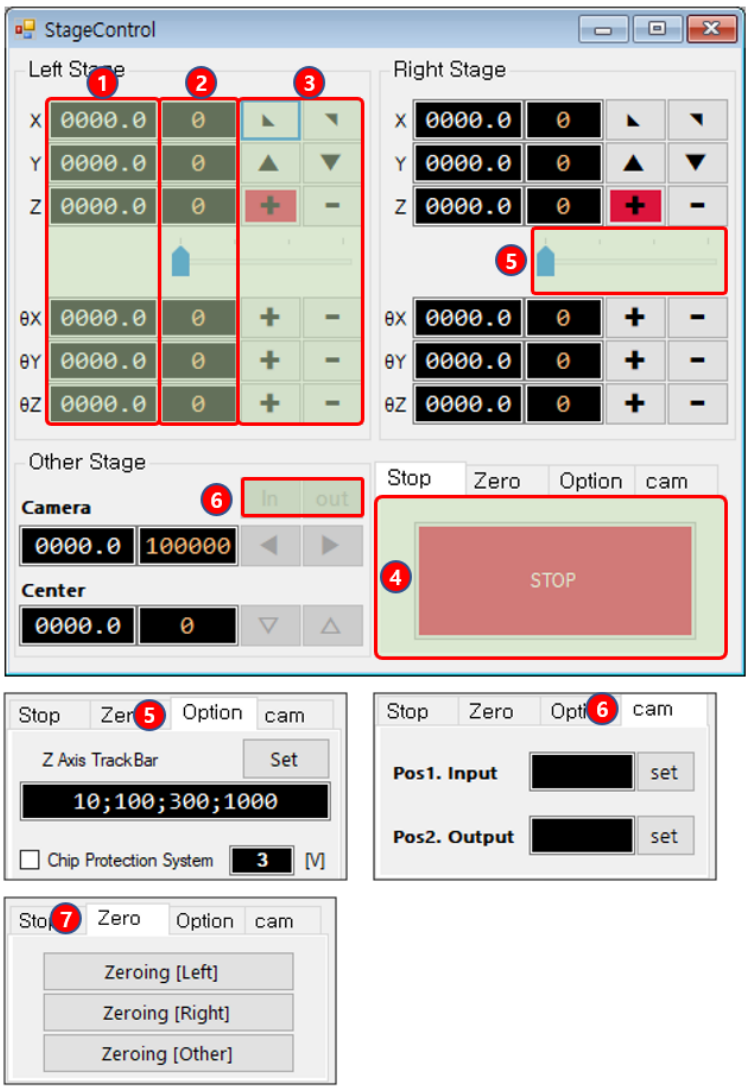


Menu – Measurement : Open the windows for measuring

Reference window : The window for measuring the Reference

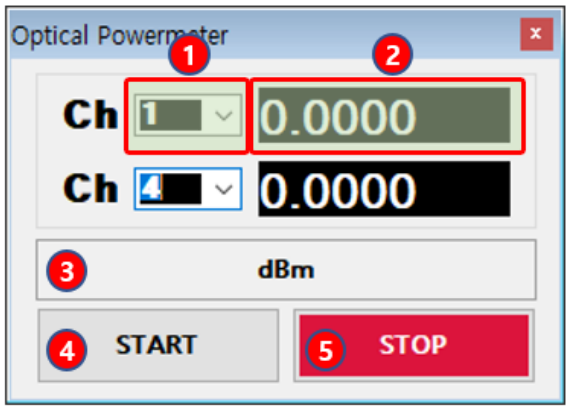
CWDM window : The window for measuring Dut chip

Form – Stage Control [The Form for controlling the stage]



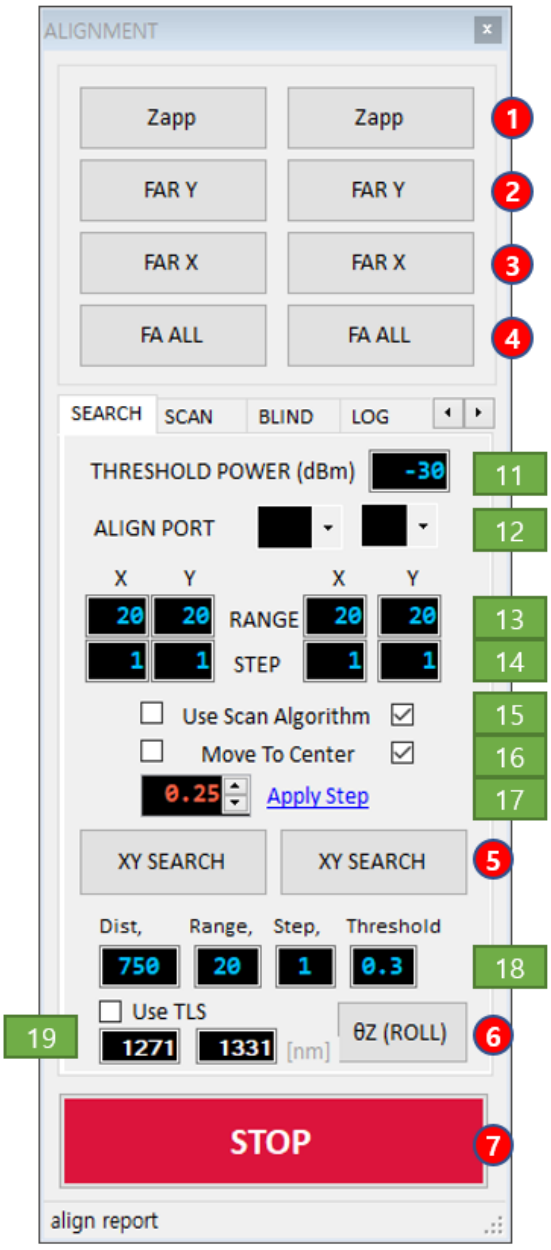
1. Current position value for each axis
2. Movement setting value
3. Move button on each axis +,- direction
4. Stage Stop button [ESC Key]
5. Trackbar for setting the movement of Z axis
6. Move after absolute positioning of Camera Stage
7. Run Zeroing for each Aligner

Form – Optical Powermeter [The form for checking the value of Powermeter]



1. Channel setting ComboBox
2. Optical power value of selected channel
3. Unit Setting button [dBm || mWatt]
4. Start : Start button for monitoring the powermeter
5. Stop : Stop button for monitoring the powermeter

Form – Alignment [The form for the optical alignment]



1. Zapp : Run Z-axis approach

2. FAR Y : Run Theta Y-axis Arrangement

3. FAR X : Run Theta X-axis Arrangement

4. FAR ALL : Run Theta X-axis and Theta Y-axis at the same time

5. XY SEARCH : Run optical alignment

6. ΘZ (ROLL) : Run Roll (Theta Z-axis) alignment

7. STOP : Force shutdown during each alignment

11. Set the minimum optical power during the optical alignment

12. ALIGN Port : Set both end channels of the standard powermeter channel & Roll aligning during XY SEARCH

13. RANGE : Search range during XY SEARCH

14. STEP : Movement step during XY SEARCH

15. Scan Algorithm : Scanning method for X-axis and Y-axis || Hill Climb Search method

16. Move To Center : When using Scan Algorithm, move to the center after scan(Using for Multi-mode Faber Scan)

17. Apply Step : Set the movement step when using the HillClimb Search method

18. Roll Align setting value [Distance : The distance of both ends of Align Port,

Range : Roll Scan Range

Step : Roll Scan Step

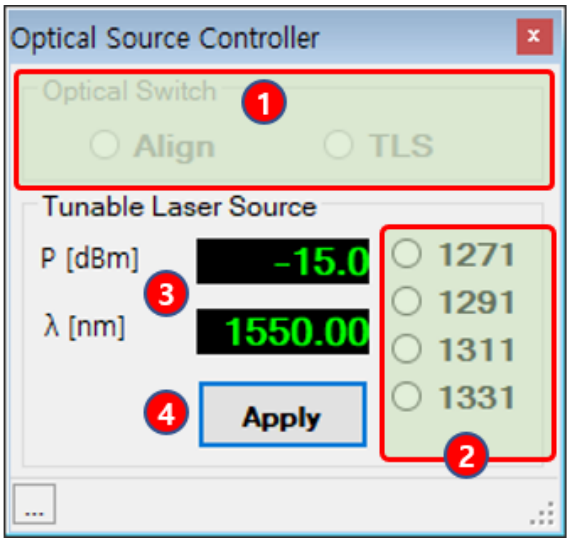
Threshold : Set the failure of Roll Scan

19. Use TLS : Checked – Run Roll using TLS

Un-checked – Run Roll using Broadband

Form – Optical Source Controller

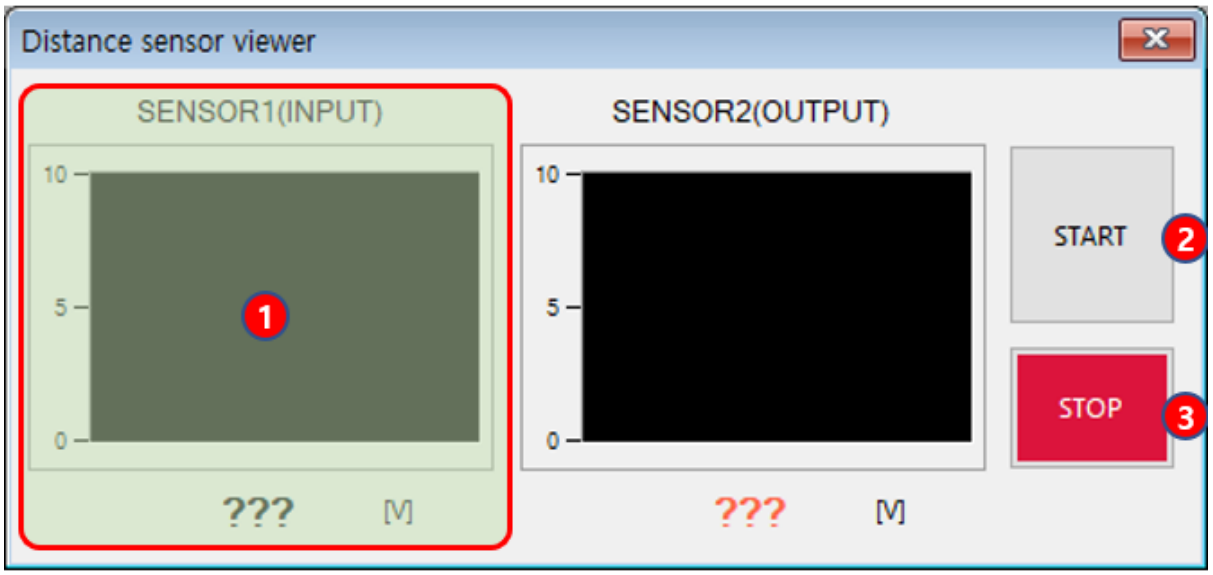
[The Form of optical switch and TLS control]



1. Optical Switch : Switch Align Source and TLS
2. Change the wavelength setting of TLS
3. Set the wavelength and Power value of TLS
4. Apply the above setting

※ **Tunable Laser Source cannot be used in Tcp_Server mode.**

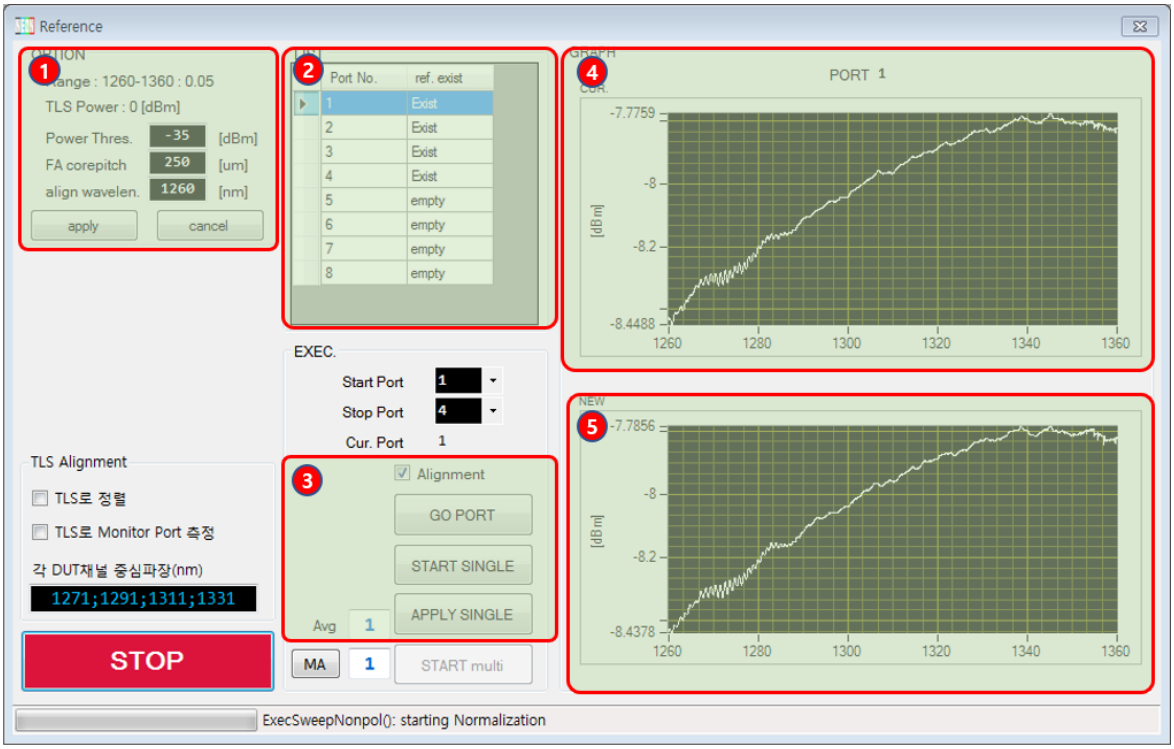
Form – Distance Sensor viewer [The Form for confirming the contact sensor value]



1. Volt value and progress graph of current sensor
2. Sensor monitor 'Start' button
3. Sensor monitor 'Stop' button

※ Using for monitoring only for setting the sensor, and close the window during the chip measurement.

Form – Reference [Form for measuring the Reference power]



1. Option : Reference measurement option setting

   Power Thres : Threshold power value during alignment.

   FA corepitch : Chip pitch of Output FAB

   Align wavelen. : Set the wavelength when using TLS alignment

   Apply : Save and apply the option setting value

2. List : Select the measurement for each channel and check the Reference value

3. Alignment : When measuring the Reference, perform the alignment before the measurement

   GO PORT : Move function to selected channel from the List

   START SINGLE : Measure the reference of the selected channel

   APPLY SINGLE : Apply and save the measured Reference value

4. Current Graph : Graph of Reference value previously measured and applied

5. NEW Graph : Graph of newly measured Reference values by clicking 'START SINGLE'

Form – CWDM Mux (Fiber Array) [Dut Chip measurement]

1. The window for inputting the serial of DUT Chip and number of Barchip
2. Measurement List window : Output the list for the number of Serial entered, and display the measurement status
3. MEASURE button : Start button for measuring DUT Chip
4. Graph : IL graph of measured DUT chip
5. Analysis : Result analyzing window of measured DUT chip

11. Option

    Chip width : Chip spacing – the distance between chip to Barchip

    Channel Space : Output core pitch of Dut chip

12. Out FAB : Always fix it with MMF(1~4) and measuring it

13. Channel Direction : Set the order of wavelength by channel of Dut chip (Forward || Reverse)

14. Gains : Measure it once after fixing the measurement Gain value of Powermeter || Calculate the Data after measuring 'two' of Gain value

15. FA Arrangement : Theta X-axis, Theta Y-axis Alignment, Measurement : Run sweep

Alignment : Perform the optical alignment,

Clading : Measure the Clading mode (2 times of sweep is performed)

Roll : Perform the roll alignment

Auto Repeat : Repeat measurement

Approach : Perform Z-axis approach ,

Auto Return : Return to first position after all chip measurement is finished.

OutAlign# : Output optical alignment only in multiples of the corresponding value when measuring Barchip

Center Stage : Center Stage usage status

Align by TLS : Perform the optical alignment using TLS

16. Save

AutoSave : Automatically save values after chip measurement

Full : Save all range values of sweep.

Range : Save the value only by the set range

Save Folder : Set the save folder

Create Wafer Folder : Create a folder with the name of the wafer in the save folder and save the data.

4. Software - Config Setting

A. **Config_init** [Initial setting file for program and equipment]

i. APP_NAME : Application Name

ii. GPIB_BOARD : GPIB Board Number (Check NI Max)

iii. IsTlsFrame : Check both THL and P.M are installed on mainFrame (flase setting)

iv. IS_AGILENT_TLS : Agilent TLS status (Setting True)

v. GPIB_TLS : TLS Frame address (Check NI Max)

vi. GPIB_PM : PowerMeter address (Check NI Max)

vii. TLS_PARAM : Sweep setting

TLS power ; Start Wave ; Stop Wave ; Step Wave ; Sweep Speed

viii. POWERMETER_GAIN : Gain value of PowerMeter measurement

ix. PM_ALIGN_GAIN : Gain value of PowerMeter alignment

x. COMPORT_OSW1 : Optical Switch address (Check device manager)

xi. OSW_ALIGN_PORT : (Align source connection number)

xii. OSW_TLS_PORT: TLS source connection number

xiii. OSW_Using : Optical Switch usage status

xiv. OSW_IS_NEON : (Setting false)

xv. MC_Type : (Setting Nova)

xvi. Center_Info : [Usage status] ; [MC-axis] ; [Forward F || Reverse R]

xvii. Camera_Info : [Usage status] ; [MC-axis] ; [Forward F || Reverse R]

xviii. DAQ_AICH_ADDRESS : DAQ connection address of Distance Sensor

xix. DAQ_AICH_RSE : RSE status (Setting false)

xx. DAQ_AICH_VOLT : Daq volt setting (Setting 0;10)

xxi. DAQ_IS_SFAC : (Setting false)

xxii. DAQ_AIR_Using : (Setting false)

xxiii. DAQ_AIR_LEFT : (Setting 0)

xxiv. DAQ_AIR_RIGHT : (Setting 1)

B. Server Config.txt [Setting the address of TCP Server]

i. 192.168.0.1 : IP Address of TCP Server