Mura/CUC

JIG internal fail safe criteria

Objective

- Limit Setting is Not Product Spec, Not Production Spec.

- This Criteria is Fail Proof to prevent leakage of D-Mura/CUC Abnormal Adjustment Error due to JIG or Circumstance.

- This criteria handle by own factory and any issue, line slow or line stop **cannot charge to SOEM and SGMO**

- WW support window person for De-mura and CUC criteria
  - Jig Module Member
    1. Mohd Marzudi <MohdMarzudi.MatDaud@sony.com>
    2. Nor Faezah <NorFaezah.Mahtar@sony.com>

Mura/CUC Operation

★Specification

1. Adjust Mura/CUC for all panel individually

2. Mura correction Measurement level : 100/80/60/40/20 IRE

    （1023 , 896 , 640 , 384 , 128）

    Brightness 400cd/m² ～ 2cd/m²
    ※Horizontal correction data is common for the same H position
    ※Vertical correction data is common for the same V positon
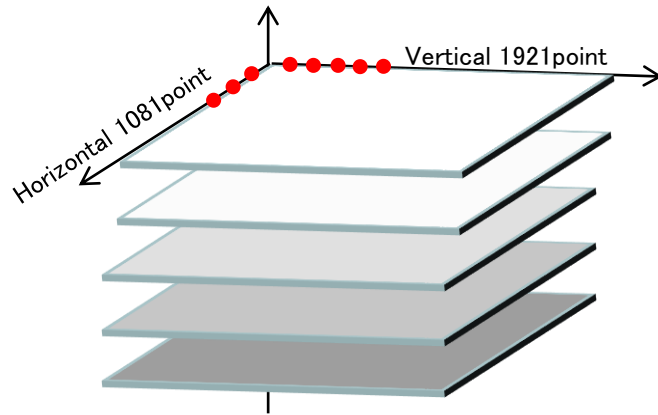   Correction point： H 1920 × V 1081

3. CUC measurement level : 60IRE

    （640）
    Correction point ： H 61 × V 32

    *Due to tact time reason , define these measurement level
    If more measurement level has higher correction accuracy

Mura CUC correction flow

①Mura correction

Horizontal 1081point
Vertical 1921point

1. Measure 100/80/60/40/20 IRE
2. Collect 480*270 point data
3. Calculate standard curve from 100IRE data
4. Calculate Gamma＋Ave. brightness
5. Calculate 80/60/40/20IRE H/V correction gain data
6. Linear interpolation for all point（1920*1080), decide the correction data

②Superposition

1. Select 60IRE
2. Superimpose Mura correction data

③CUC

Signal level(60%)
Horizontal 35point
Vertical 62point
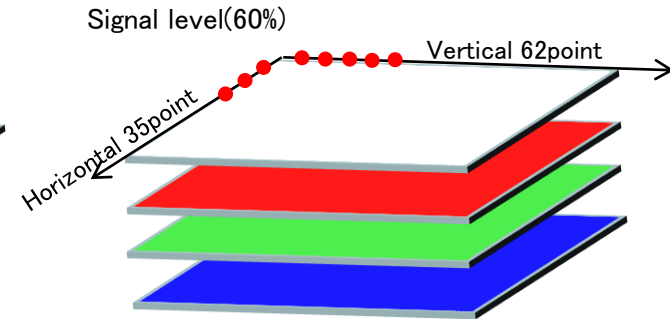
1. Measure WRGB with superimpose condition
（White is used to fix expose time）
   RG ratio: r_val/g_val
   BG ratio: b_val/g_val
2. G center is fix, R/B adjust to make it same as G center

Measurement algorithm

◆<u>Capture Edge</u>
　　　　Capture LCD edge

◆<u>Measure Brightness UF</u>
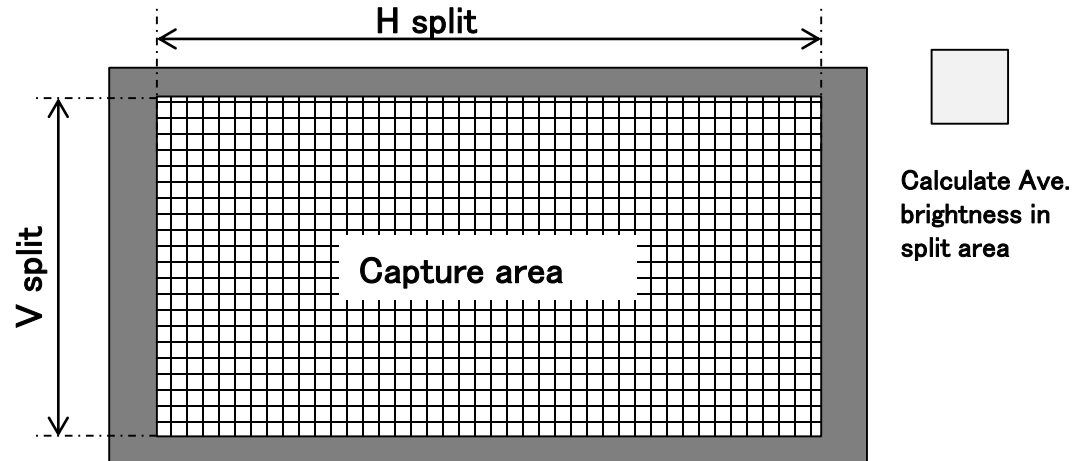　　　　Measure Ave. brightness in each split area（H×V）
　　　　Measurement data is just reactive value , not same as actual measurement value
　　　　Measurement accuracy : less than 1％

◆<u>Others</u>
　　　　Expose time : Auto
　　　　Focus : de-focus condition

H split

V split

Capture area

Calculate Ave.
brightness in
split area

CUC gain data

Adjust R/B gain value in each capture area
to get good color uniformity
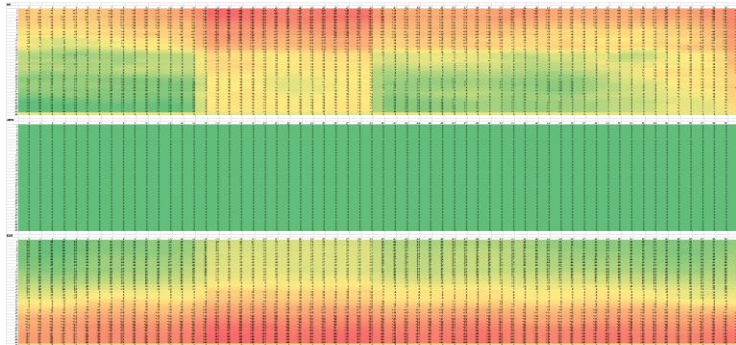
Mura/CUC issue
Example

SG signal noise

- In CUC OFF condition, we cannot see V-band mura symptom

CUC OFF

- In CUC ON condition, we can see V-band mura symptom
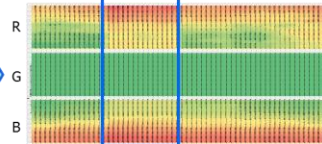
CUC ON
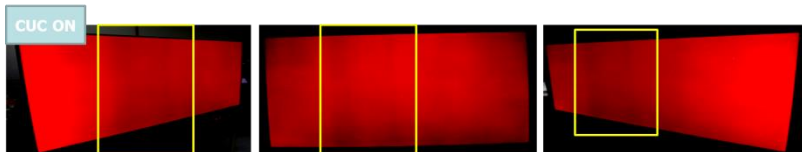
CUC_checker L2067885B$6100459

Suspicious cause

During CUC adjustment, signal noise was happened and cause wrong CUC adjustment.

CUC adjustment

Noise was happened
CUC adjust execute with noise condition

CUC log visual check

R
G
B

CUC log data mention there was abnormal noise

Actual defect symptom

Only Red w/ CUC on condition can see abnormal Mura abvious
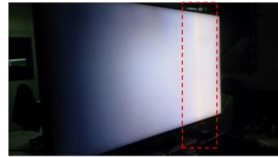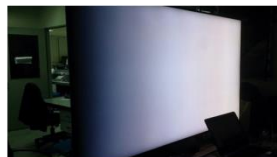
JIG setting error

SOEM analysis by Defect T-con

H ramp

Ramp pattern can see Color band

40IRE

Surround area is darker
→ Mura is worse than Off condition

Mura correction OFF   Mura correction ON

By using actual defect T-con , PME can recreate similar symptom
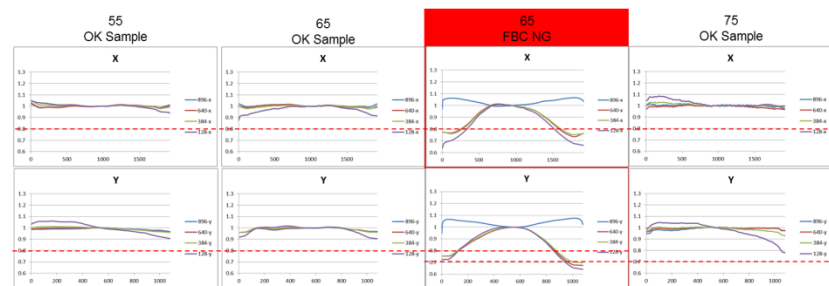That symptom can be change by Mura correction off/on

Mura correction capture log

Mura correction log found abnormality @1023

1023 NG   1023 OK

896   640   384   128

Mura correction capture data analysis 1

Hokan-data   NG   OK

NG case Hokan data has abnormal distribution

Suspicious error mechanism

During showing BLU start up pattern , JIG start Mura/CUC adjustment wrongly , then Mura correction data become abnormal

BLU power on

OK   Execute Mura/CUC adjustment

NG   Execute Mura/CUC adjustment wrongly

SOEM JIG has fixed sequence for Mura/CUC adjustment → Automatic control sequence
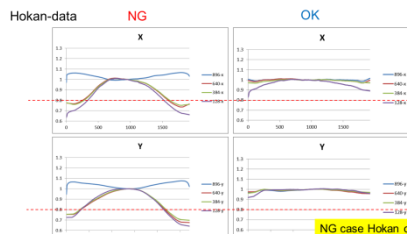Wait time before execute Mura/CUC adjustment : 8.5sec

Tentative CM ②

55 OK Sample	65 OK Sample	65 FBC NG	75 OK Sample

Put more tighten JIG criteria

Cut off serial   18/Dec 2017

	55"/65"				75"			
	Before		After		Before		After	
	Low Limit	High Limit	Low Limit	High Limit	Low Limit	High Limit	Low Limit	High Limit
896	0.6	1.3	0.8	1.3	0.6	1.3	0.7	1.3
640	0.6	1.3	0.8	1.3	0.6	1.3	0.7	1.3
384	0.3	1.3	0.8	1.3	0.3	1.3	0.7	1.3
128	0.3	1.3	0.7	1.3	0.3	1.3	0.6	1.3

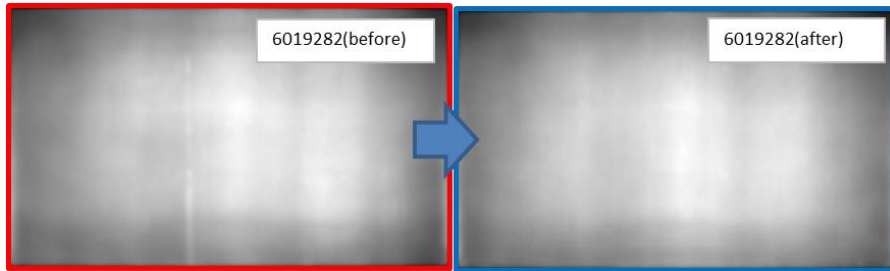| Model	SFG serial	P-Mod serial
55KP	L2167766A$5009261	A2167765A$1009172_1703
65KP	L2167771A$6007955	A2167770A$1007864_1703
75KP	L2167776A$7001078	A2167775A$1000993_1703

Human error

Screen Capture log

6019282(before)
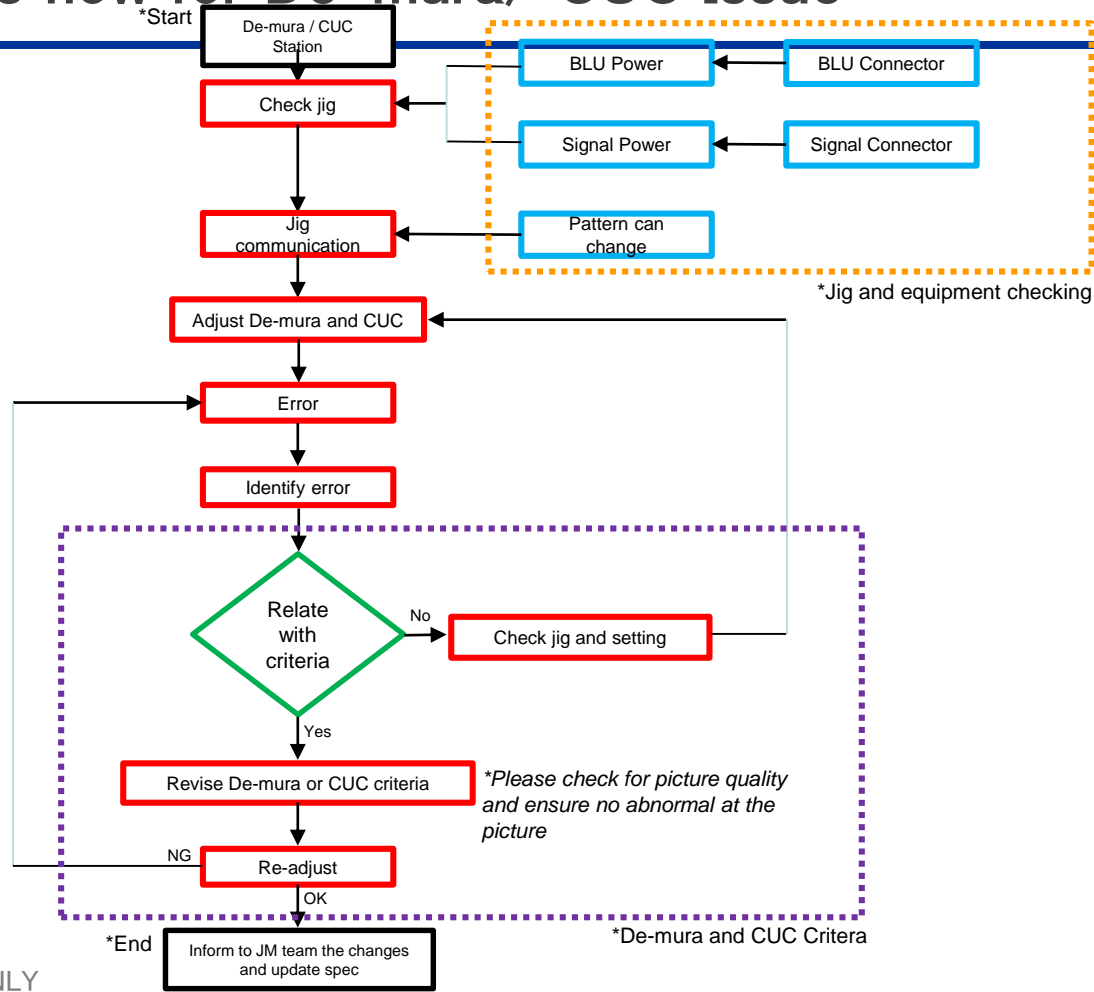
6019282(after)

Mechanism
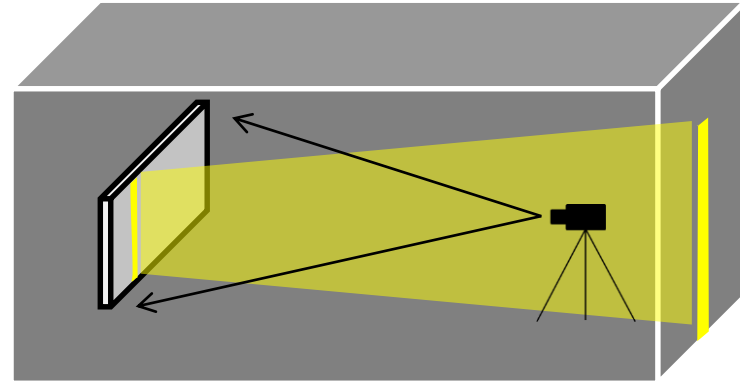
Dark room curtain had a risk that external light can go in
External light reflect to screen and JIG capture that and
adjust Mura/CUC
　→Mura/CUC on condition find abnormal Mura

Troubleshooting Flow

Analysis flow for De-mura/ CUC Issue

*Start

De-mura / CUC Station

Check jig

Jig communication

Adjust De-mura and CUC

Error

Identify error

Relate with criteria

No → Check jig and setting

Yes

Revise De-mura or CUC criteria

Re-adjust

NG

OK

Inform to JM team the changes and update spec

*End

BLU Power ← BLU Connector

Signal Power ← Signal Connector

Pattern can change

*Jig and equipment checking

*Please check for picture quality and ensure no abnormal at the picture

*De-mura and CUC Critera

Analysis flow for De-mura/ CUC Issue

NG parameter	Possible cause	First analysis method	PME Action

Mura/CUC issue → **Mura**

Possible cause:
1. SG Signal noise
2. Human error like outside light
3. JIG issue

First analysis method:
1. Check by log data (capture photo / Hokan-data)
2. Which IRE has abnormality ? (1023/846/640/348/128IRE)
3. What kind of abnormality can see by capture log ?

Screen Capture log
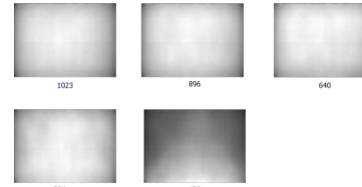
1023   896   640

384   128

Hokan-data

X   Y
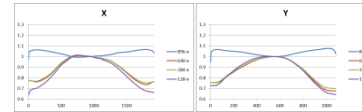
PME Action:
1. Make clear the root cause
2. Take corrective action
3. Study de-mura and CUC criteria

De-mura and CUC criteria

Before   After change to new spec

CUC

Possible cause:
1. SG Signal noise
2. Human error like outside light
3. JIG issue
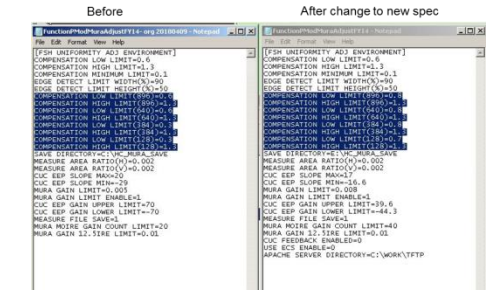
First analysis method:
1. Check by log data (CUC eep log)
2. What kind of abnormality can see by capture log ?

CUC eep log data
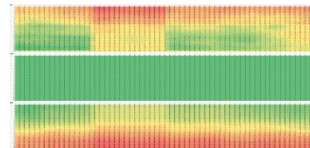
PME Action:
1. Make clear the root cause
2. Take corrective action
3. Study de-mura and CUC criteria

We have 2 kind of criteria
1. CUC data limit criteria to detect partcial error (JIG original spec)
2. CUC Zone gain criteria to detect block noise error (SOEM unique)

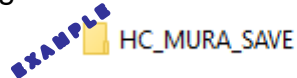#1 : CUC data limit criteria   #2 : CUC Zone gain criteria

RED
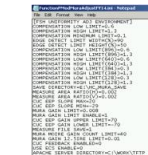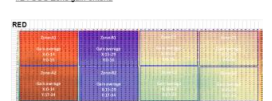
Summary page

Summary

1. JM will create save log file demura and CUC (E:/HC_MURA_SAVE) in local jig PC

    📁 HC_MURA_SAVE

2. Inside this folder only 2 type of file needed to make the demura and CUC criteria
    - Eep_<Pcode>_xxxxxxxx$xxxxxxxx_ECS_MURA_<date and time>.eep → Mura log
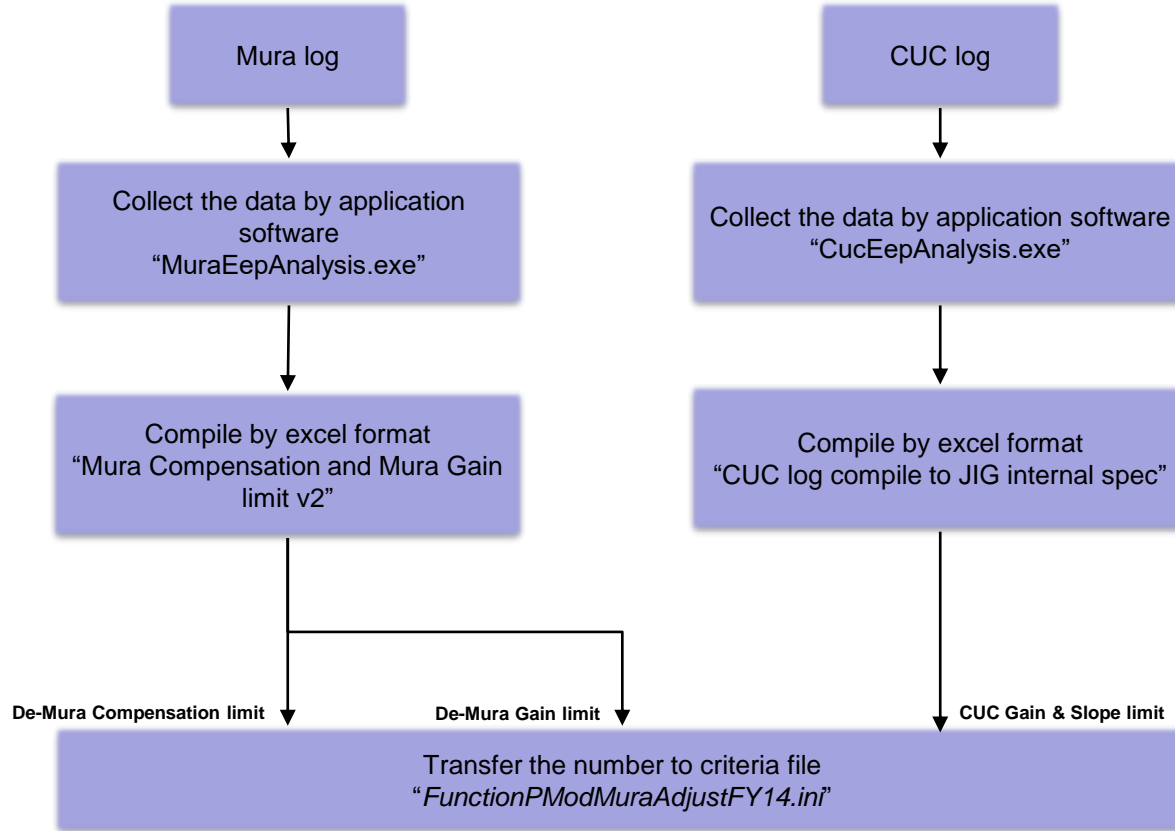   - Eep_<Pcode>_xxxxxxxx$xxxxxxxx_ECS_CUC_<date and time>.eep → CUC log

3. From this file will make 3 criteria

Criteria	Required log files	Related Application & Format	SOP
De-mura **Low & High limit**	Mura log	"MuraEepAnalysis.exe" "Mura Compensation limit Calc v.2"	P.29
De-mura **Gain limit**	Mura log		P.30
CUC **Gain & Slope**	CUC log	"CucEepAnalysis.exe" "CUC log compile for JIG internal spec"	P.31

4. From the compile criteria log will update into criteria file :
    FunctionPModMuraAdjustFY14.ini   → *2K and 4K model*
    FunctionPModMuraAdjustPQ.ini   → *with PiQ model*
    FunctionPModMuraAdjust4KBE.ini   → *OLED model*

Criteria Operation Flow

Mura log

CUC log

Collect the data by application software
"MuraEepAnalysis.exe"

Collect the data by application software
"CucEepAnalysis.exe"

Compile by excel format
"Mura Compensation and Mura Gain limit v2"

Compile by excel format
"CUC log compile to JIG internal spec"

De-Mura Compensation limit

De-Mura Gain limit

CUC Gain & Slope limit

Transfer the number to criteria file
"*FunctionPModMuraAdjustFY14.ini*"

LCM **Mura** adjustment
Fail safe Criteria
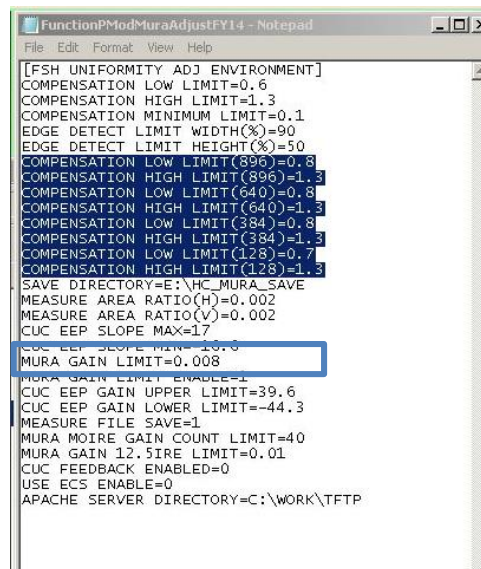
We have 2 kind of criteria
1. Mura Compensation limit (Hokan data limit) criteria to detect abnormal data (JIG original spec)
2. Mura gain limit to detect partial error (JIG original spec)

#1 : Compensation limit

#2 : Gain limit

1. Compensation limit （Hokan-data limit）

```
FunctionPModMuraAdjustFY14 - Notepad
File  Edit  Format  View  Help
[FSH UNIFORMITY ADJ ENVIRONMENT]
COMPENSATION LOW LIMIT=0.6
COMPENSATION HIGH LIMIT=1.3
COMPENSATION MINIMUM LIMIT=0.1
EDGE DETECT LIMIT WIDTH(%)=90
EDGE DETECT LIMIT HEIGHT(%)=50
COMPENSATION LOW LIMIT(896)=0.8
COMPENSATION HIGH LIMIT(896)=1.3
COMPENSATION LOW LIMIT(640)=0.8
COMPENSATION HIGH LIMIT(640)=1.3
COMPENSATION LOW LIMIT(384)=0.8
COMPENSATION HIGH LIMIT(384)=1.3
COMPENSATION LOW LIMIT(128)=0.7
COMPENSATION HIGH LIMIT(128)=1.3
SAVE DIRECTORY=C:\MURA_SAVE
MEASURE AREA RATIO(H)=0.002
MEASURE AREA RATIO(V)=0.002
CUC EEP SLOPE MAX=17
CUC EEP SLOPE MIN=-16.6
MURA GAIN LIMIT=0.008
MURA GAIN LIMIT ENABLE=1
CUC EEP GAIN UPPER LIMIT=39.6
CUC EEP GAIN LOWER LIMIT=-44.3
MEASURE FILE SAVE=1
MURA MOIRE GAIN COUNT LIMIT=40
MURA GAIN 12.5IRE LIMIT=0.01
CUC FEEDBACK ENABLED=0
USE ECS ENABLE=0
APACHE SERVER DIRECTORY=C:\WORK\TFTP
```

Hokan-data limit

55 OK Sample / 65 OK Sample / 65 FBC NG / 75 OK Sample — X and Y uniformity graphs

|		55"/65"				75"			
		Before		After		Before		After	
		Low Limit	High Limit	Low Limit	High Limit	Low Limit	High Limit	Low Limit	High Limit
896		0.6	1.3	0.8	1.3	0.6	1.3	0.7	1.3
640		0.6	1.3	0.8	1.3	0.6	1.3	0.7	1.3
384		0.3	1.3	0.8	1.3	0.3	1.3	0.7	1.3
128		0.3	1.3	0.7	1.3	0.3	1.3	0.6	1.3

```
FunctionPModMuraAdjustFY14 - Notepad

File  Edit  Format  View  Help

[FSH UNIFORMITY ADJ ENVIRONMENT]
COMPENSATION LOW LIMIT=0.6
COMPENSATION HIGH LIMIT=1.3
COMPENSATION MINIMUM LIMIT=0.1
EDGE DETECT LIMIT WIDTH(%)=90
EDGE DETECT LIMIT HEIGHT(%)=50
COMPENSATION LOW LIMIT(896)=0.8
COMPENSATION HIGH LIMIT(896)=1.3
COMPENSATION LOW LIMIT(640)=0.8
COMPENSATION HIGH LIMIT(640)=1.3
COMPENSATION LOW LIMIT(384)=0.8
COMPENSATION HIGH LIMIT(384)=1.3
COMPENSATION LOW LIMIT(128)=0.7
COMPENSATION HIGH LIMIT(128)=1.3
SAVE DIRECTORY=E:\HC_MURA_SAVE
MEASURE AREA RATIO(H)=0.002
MEASURE AREA RATIO(V)=0.002
CUC EEP SLOPE MAX=17
CUC EEP SLOPE MIN=-16.6
MURA GAIN LIMIT=0.008
MURA GAIN LIMIT ENABLE=1
CUC EEP GAIN UPPER LIMIT=39.6
CUC EEP GAIN LOWER LIMIT=-44.3
MEASURE FILE SAVE=1
MURA MOIRE GAIN COUNT LIMIT=40
MURA GAIN 12.5IRE LIMIT=0.01
CUC FEEDBACK ENABLED=0
USE ECS ENABLE=0
APACHE SERVER DIRECTORY=C:\WORK\TFTP
```

Mura gain limit

Microsoft Excel
ƒ[ƒN ƒV[ƒg

128-x GAIN moving agerage (12data)

Diff   vs moving average
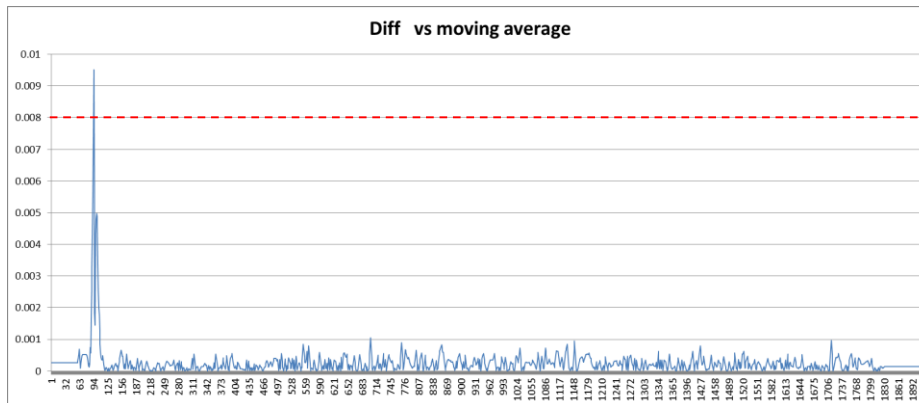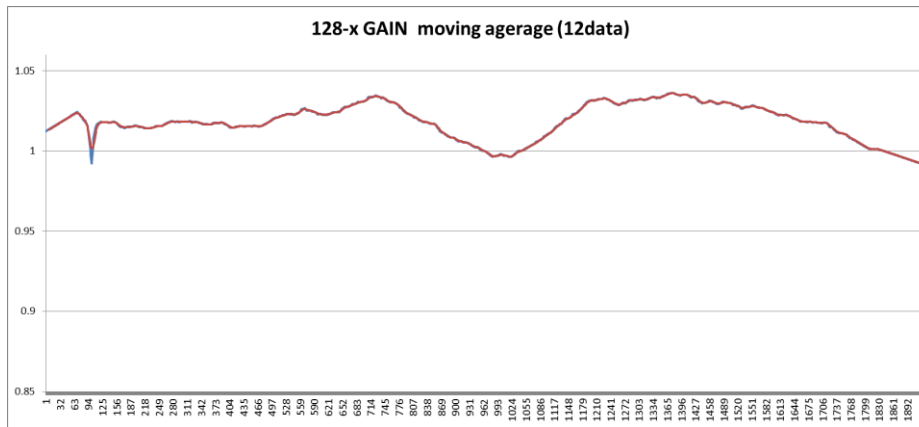
LCM **CUC** adjustment
Fail safe Criteria

We have CUC data limit criteria to detect partial error (JIG original spec)

CUC data limit criteria


```
FunctionPModMuraAdjustFY14.ini - Notepad
File  Edit  Format  View  Help
[FSH UNIFORMITY ADJ ENVIRONMENT]
COMPENSATION LOW LIMIT=0.6
COMPENSATION HIGH LIMIT=1.3
COMPENSATION MINIMUM LIMIT=0.1
EDGE DETECT LIMIT WIDTH(%)=90
EDGE DETECT LIMIT HEIGHT(%)=50
COMPENSATION LOW LIMIT(896)=0.6
COMPENSATION HIGH LIMIT(896)=1.3
COMPENSATION LOW LIMIT(640)=0.6
COMPENSATION HIGH LIMIT(640)=1.3
COMPENSATION LOW LIMIT(384)=0.3
COMPENSATION HIGH LIMIT(384)=1.3
COMPENSATION LOW LIMIT(128)=0.3
COMPENSATION HIGH LIMIT(128)=1.3
SAVE DIRECTORY=E:\HC_MURA_SAVE
MEASURE AREA RATIO(H)=0.002
MEASURE AREA RATIO(V)=0.002
CUC EEP SLOPE MAX=20
CUC EEP SLOPE MIN=-29
MURA GAIN LIMIT=0.008
MURA GAIN LIMIT ENABLE=1
CUC EEP GAIN UPPER LIMIT=70
CUC EEP GAIN LOWER LIMIT=-70
MEASURE FILE SAVE=1
MURA MOIRE GAIN COUNT LIMIT=40
MURA GAIN 12.5IRE LIMIT=0.01
CUC FEEDBACK ENABLED=0
USE ECS ENABLE=0
APACHE SERVER DIRECTORY=C:\WORK\TFTP
```

CUC Slope

CUC Gain

MIN_Y_SLOPE (R)

L2178398A$9999006

MIN_X_SLOPE (R)
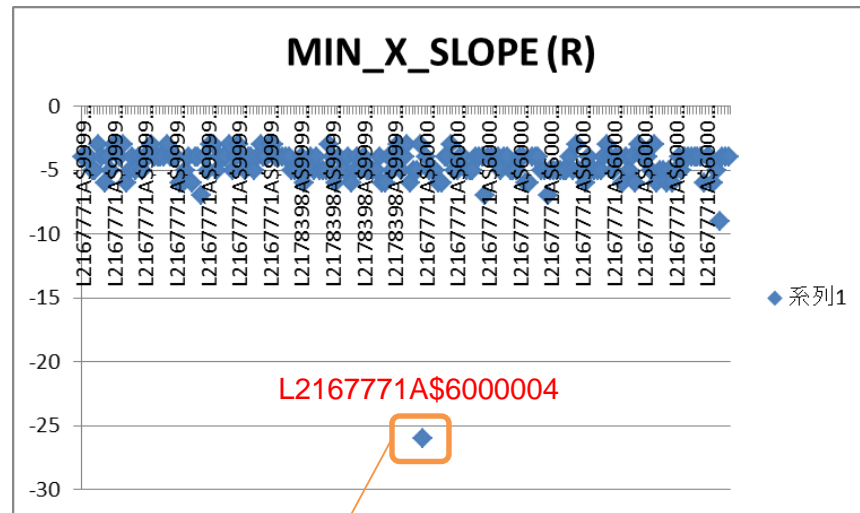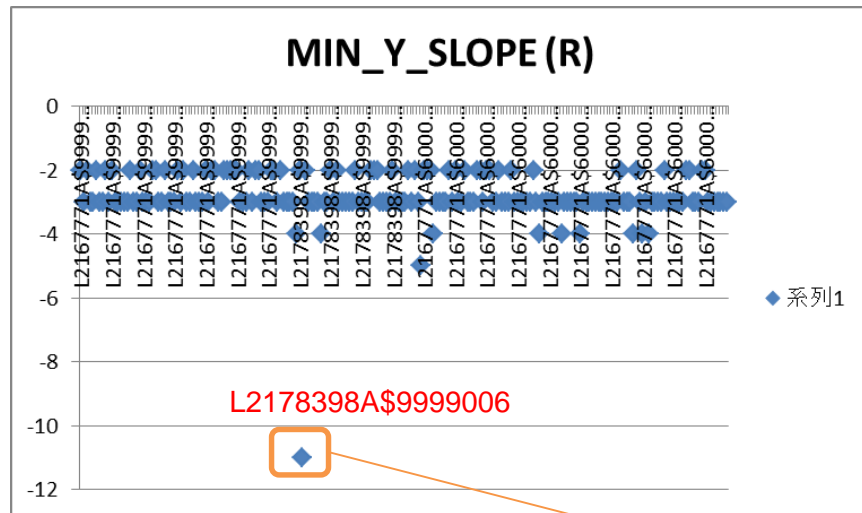
L2167771A$6000004

SCC	NG(I	MAX_GAIN	MIN_GAIN	AVE_GAIN	MAX_X_SLOPE	MIN_X_SLOPE	MAX_Y_SLOPE	MIN_Y_SLOPE
L2178398A$9999006		12	-18	0	3	-6	16	-11
L2167771A$6000004		3	-42	-10	3	-26	3	-5
	ave.	8.8	-14.7	-2.8	3.7	-4.6	2.7	-2.8
	sigma	3.0	4.9	3.0	0.9	1.8	1.1	0.8
	Ave.+6sigma	26.5	14.9	15.0	9.0	5.9	9.1	1.9
	Ave.-6sigma	-9.0	-44.3	-20.7	-1.6	-15.2	-3.8	-7.5

*NG one is over 6sigma

EXAMPLE

Microsoft Excel
ƒ[ƒNƒV[ƒg

CUC Gain and Slope

```
FunctionPModMuraAdjustFY14.ini - Notepad
File  Edit  Format  View  Help

[FSH UNIFORMITY ADJ ENVIRONMENT]
COMPENSATION LOW LIMIT=0.6
COMPENSATION HIGH LIMIT=1.3
COMPENSATION MINIMUM LIMIT=0.1
EDGE DETECT LIMIT WIDTH(%)=90
EDGE DETECT LIMIT HEIGHT(%)=50
COMPENSATION LOW LIMIT(896)=0.6
COMPENSATION HIGH LIMIT(896)=1.3
COMPENSATION LOW LIMIT(640)=0.6
COMPENSATION HIGH LIMIT(640)=1.3
COMPENSATION LOW LIMIT(384)=0.3
COMPENSATION HIGH LIMIT(384)=1.3
COMPENSATION LOW LIMIT(128)=0.3
COMPENSATION HIGH LIMIT(128)=1.3
SAVE DIRECTORY=E:\HC_MURA_SAVE
MEASURE AREA RATIO(H)=0.002
MEASURE AREA RATIO(V)=0.002
CUC EEP SLOPE MAX=20
CUC EEP SLOPE MIN=-29
MURA GAIN LIMIT=0.008
MURA GAIN LIMIT ENABLE=1
CUC EEP GAIN UPPER LIMIT=70
CUC EEP GAIN LOWER LIMIT=-70
MEASURE FILE SAVE=1
MURA MOIRE GAIN COUNT LIMIT=40
MURA GAIN 12.5IRE LIMIT=0.01
CUC FEEDBACK ENABLED=0
USE ECS ENABLE=0
APACHE SERVER DIRECTORY=C:\WORK\TFTP
```

		Red MAX_GAIN	MIN_GAIN	AVE_GAIN	MAX_X_SLOPE	MIN_X_SLOPE	MAX_Y_SLOPE	MIN_Y_SLOPE	Blue MAX_GAIN	MIN_GAIN	AVE_GAIN	MAX_X_SLOPE	MIN_X_SLOPE	MAX_Y_SLOPE	MIN_Y_SLOPE
55	ave.	8.9	-13.5	-0.9	3.0	-3.4	2.8	-3.3	4.6	-9.8	-1.6	3.1	-2.9	2.2	-2.1
	sigma	2.3	3.4	1.1	0.6	1.1	0.8	0.6	2.0	3.3	1.4	0.9	1.3	0.4	0.3
	Ave.+6sigma	22.6	6.9	6.0	6.6	3.3	7.5	0.4	16.3	10.1	6.6	8.4	5.2	4.7	-0.5
	Ave.-6sigma	-4.7	-33.8	-7.8	-0.6	-10.2	-1.9	-7.0	-7.1	-29.6	-9.8	-2.3	-11.0	-0.3	-3.6
65	ave.	8.8	-14.7	-2.8	3.7	-4.6	2.7	-2.8	4.6	-12.3	-1.6	4.1	-3.2	2.3	-2.4
	sigma	3.0	4.9	3.0	0.9	1.8	1.1	0.8	2.0	2.9	1.4	1.4	0.7	1.1	1.3
	Ave.+6sigma	26.5	14.9	15.0	9.0	6.5	9.1	1.9	16.8	5.0	6.6	12.4	0.7	8.9	5.2
	Ave.-6sigma	-9.0	-44.3	-20.7	-1.6	-15.2	-3.8	-7.5	-7.6	-29.6	-9.7	-4.2	-7.2	-4.3	-10.0
75	ave.	18.0	-6.5	5.4	5.2	-4.3	4.9	-4.9	13.5	-12.7	1.5	4.6	-4.4	5.3	-4.7
	sigma	3.6	2.8	2.1	0.9	0.8	2.0	1.7	3.5	3.6	1.6	0.7	0.7	2.0	2.0
	Ave.+6sigma	39.6	10.1	17.7	10.8	0.2	16.7	5.2	34.7	8.7	11.1	8.8	-0.3	17.0	7.2
	Ave.-6sigma	-3.7	-23.2	-7.0	-0.3	-8.8	-6.9	-14.9	-7.8	-34.1	-8.0	0.5	-8.5	-6.4	-16.6
	55	22.6	-33.8		6.6	-10.2	7.5	-7.0	16.3	-29.6		8.4	-11.0	4.7	-3.6
	65	26.5	-44.3		9.0	-15.2	9.1	-7.5	16.8	-29.6		12.4	-7.2	8.9	-10.0
	75	39.6	-23.2		10.8	-8.8	16.7	-14.9	34.7	-34.1		8.8	-8.5	17.0	-16.6
	Worst	39.6	-44.3		10.8	-15.2	16.7	-14.9	34.7	-34.1		12.4	-11.0	17.0	-16.6

JIG criteria

CUC EEP GAIN UPPER LIMIT	39.6
CUC EEP GAIN LOWER LIMIT	-44.3
CUC EEP SLOPE MAX	17.0
CUC EEP SLOPE MIN	-16.6

*Gain limit need to be common for Red/Blue & all inch size based on current JIG DLL limitation

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Basically this criteria can catch specific line error by Max/Min gain or X/Y slope check .
Max/Min gain : limit for Max/Min gain value in the screen
X/Y slope check : the difference between adjacent point

Ex1. KPSP65 CS2 CUC error
   L2178398A$9999006

Ex2. KP65 PP CUC error
   L2167771A$6000004

Excel File

Number of data , most max data, most min and average σ

Summary of each level max, min and σ

Compensation low and high limit data for .ini file with 6σ value

All data copy from save fail

Summary tab

Each level max gain limit and σ

Mura gain limit value for .ini file with max value with max of 6σ value

Max and min gain for **RED** of all serial

Max and min gain for **BLUE** of all serial

Max and min slope for **RED**

Max and min slope for **BLUE**

Summary of all above data for average, σ and average±6 σ

Each segment gain and slope data summary

RED max min gain and max min slope

BLUE max min gain and max min slope

Final max and min for gain and slope

Graph showing distribution trend of all data slope data for max, min x and y

SOP
Fail safe Criteria

1. Open *MuraEepAnalysis.exe*

Select mura data to be read

Target directory for mura data

MuraEepAnalysis.exe

2. Select the mura folder

3. Click LOAD

4. Wait until finish and log save

EEP Load Finish

OK

Hit Count 141/141 — Data count

LOG SAVE

5. Open the save file and *Mura Compensation and Mura Gain limit v2.xlsx* then copy to Raw Data Mura sheet

Mura Compensation and Mura Gain

6. From the summary sheet all the data will be as below example

Proposal	
COMPENSATION LOW LIMIT(896)	0.9087
COMPENSATION HIGH LIMIT(896)	1.0838
COMPENSATION LOW LIMIT(640)	0.8780
COMPENSATION HIGH LIMIT(640)	1.1031
COMPENSATION LOW LIMIT(384)	0.8237
COMPENSATION HIGH LIMIT(384)	1.1357
COMPENSATION LOW LIMIT(128)	0.6556
COMPENSATION HIGH LIMIT(128)	1.1920

9. This data can be transfer to the criteria file
   Example:

FunctionPModMuraAdjustFY1... - Notepad

File Edit Format View

[FSH UNIFORMITY ... ENVIRONMENT]
COMPENSATION L ... LIMIT=0.6
COMPENSATI ... IGH LIMIT=1.3
COMPENSAT ... MINIMUM LIMIT=0.1
EDGE DETEC ... LIMIT WIDTH(%)=90
EDGE DETECT ... HEIGHT(%)=90
COMPENSATION LOW LIMIT(896)=0.6
COMPENSATION HIGH LIMIT(896)=1.3
COMPENSATION LOW LIMIT(640)=0.6
COMPENSATION HIGH LIMIT(640)=1.3
COMPENSATION LOW LIMIT(384)=0.3
COMPENSATION HIGH LIMIT(384)=1.3
COMPENSATION LOW LIMIT(128)=0.3
COMPENSATION HIGH LIMIT(128)=1.3
SAVE DIRECTORY ... MURA SAVE
MEASURE AREA RATIO(H)=0.002
MEASURE AREA RATIO(V)=0.002
CUC EEP SLOPE MAX=20

1. From the summary sheet of *Mura Compensation and Mura Gain limit*
2. All of the max gain value for all level have been selected together with it average with 6 sigma value

Gain limit Summary				max		σ
	896	x		0.0859		0.0002
		y		0.0217		0.0002
	640	x		0.0859		0.0002
		y		0.0217		0.0002
	384	x		0.0859		0.0002
		y		0.0217		0.0002
	128	x		0.0859		0.0002
		y		0.0217		0.0002

3. From all of the value the mura gain limit were calculate base on the max gain with max 6 sigma data

Proposal	
Mura Gain LIMIT	0.0080

4. From the mura gain limit value will transfer to the file criteria

0.0080

```
FunctionPModMuraAdjustFY14.ini - Notepad
File  Edit  Format  View  Help
[FSH UNIFORMITY ADJ ENVIRONMENT]
COMPENSATION LOW LIMIT=0.6
COMPENSATION HIGH LIMIT=1.3
COMPENSATION MINIMUM LIMIT=0.1
EDGE DETECT LIMIT WIDTH(%)=90
EDGE DETECT LIMIT HEIGHT(%)=50
COMPENSATION LOW LIMIT(896)=0.6
COMPENSATION HIGH LIMIT(896)=1.3
COMPENSATION LOW LIMIT(640)=0.6
COMPENSATION HIGH LIMIT(640)=1.3
COMPENSATION LOW LIMIT(384)=0.3
COMPENSATION HIGH LIMIT(384)=1.3
COMPENSATION LOW LIMIT(128)=0.3
COMPENSATION HIGH LIMIT(128)=1.3
SAVE DIRECTORY=E:\HC_MURA_SAVE
MEASURE AREA RATIO(H)=0.002
MEASURE AREA RATIO(V)=0.002
CUC EEP SLOPE MAX=20
CUC EEP SLOPE MIN=-20
MURA GAIN LIMIT=0.008
MURA GAIN LIMIT ENABLE=1
CUC EEP GAIN UPPER LIMIT=70
CUC EEP GAIN LOWER LIMIT=-70
```

1. Open *CucEepAnalysis.exe*
2. Select as below:

CucEepAnalysis.exe

CUC OK Result

Red

Target directory for CUC data

De-Mura CUC EEP GAIN ANALYSIS

Select file type: CUC OK RESULT
RED or BLUE: RED
Target directory: E:\CHH49 MVT CUC log   SEL
Panel S/N list   LOAD
Hit Count
LOG SAVE

3. CUC file as below

Eep_18942700_18942700$1000001_ECS_CUC_20171016115247.eep
Eep_18942700_18942700$1000001_ECS_CUC_20171016114310.eep
Eep_18942700_18942700$1000002_ECS_CUC_20171016155906.eep
Eep_18942700_18942700$1000003_ECS_CUC_20171016114403.eep
Eep_18942700_18942700$1000005_ECS_CUC_20171016114847.eep
Eep_18942700_18942700$1000006_ECS_CUC_20171016120806.eep
Eep_18942700_18942700$1000006_ECS_CUC_20171016114206.eep

4. Press LOAD until finish

EEP Load Finish
OK
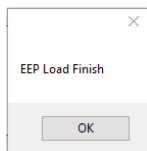
5. Log save and repeat step 2 for Blue

LOG SAVE
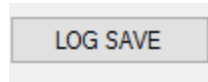
CUC log compile r JIG internal spec.x

6. Open file *CUC log compile for JIG internal Spec*
7. Copy the **compile data** for the red and blue that are save earlier into the **CUC log compile for JIG internal spec** at the log compile sheet

SCC	NG	MAX_GAIN	MIN_GAIN	AVE_GAIN	MAX_X_SLOPE	MIN_X_SLOPE	MAX_Y_SLOPE	MIN_Y_SLOPE	MAX_GAIN	MIN_GAIN	AVE_GAIN	MAX_X_SLOPE	MIN_X_SLOPE	MAX_Y_SLOPE	MIN_Y_SLOPE
18942700$1000001		18	-7	3	3	-3	4	-2	6	-13	-1	3	-3	2	-2
18942700$1000001		19	-8	3	3	-3	3	-2	4	-16	-4	3	-3	2	-2
18942700$1000002		28	-3	8	3	-3	4	-2	5	-15	-2	4	-3	3	-2
18942700$1000003		13	-4	3	3	-3	3	-2	9	-10	-1	3	-3	2	-2
18942700$1000004		18	-1	5	3	-3	3	-2	7	-12	-2	4	-4	3	-2
18942700$1000005		25	-2	9	3	-3	3	-2	8	-11	0	3	-3	2	-2
18942700$1000006		16	-4	4	3	-3	3	-2	9	-15	-1	3	-3	2	-2
18942700$1000007		17	-3	3	3	-4	3	-1	6	-11	-2	3	-3	2	-2
18942700$1000008		19	-4	5	3	-3	3	-2	4	-16	-4	3	-3	1	-2
18942700$1000009		21	-3	7	3	-3	4	-2	9	0	0	3	-3	2	-2

8. Copy the average data and sigma that been compile to summary sheet

3774															
3775	ave.	15.0	-10.7	1.2	3.2	-6.1	3.2	-3.1	7.5	-11.9	-1.1	2.9	-4.7	2.6	-3.2
3776	sigma	7.3	4.8	2.5	0.5	1.9	0.6	0.5	3.6	4.0	1.7	0.6	1.8	0.6	0.6
3776	Ave.+6sigma	59.1	18.2	16.2	6.5	7.0	7.0	0.5	28.9	12.1	9.2	6.7	6.1	6.1	0.2
3777	Ave.-6sigma		-39.4	-13.9		-17.4		-6.3		-35.9	-11.4		-14.2		-6.6

9. From all the data select the worse value to be the jig criteria
10. Copy the jig criteria into FunctionModAjustFY14.ini file

JIG criteria

CUC EEP GAIN UPPER LIMIT	59.1
CUC EEP GAIN LOWER LIMIT	-39.4
CUC EEP SLOPE MAX	7.2
CUC EEP SLOPE MIN	-17.4

FunctionPModMuraAdjustFY14.ini - Notepad
File Edit Format View Help
[FSH UNIFORMITY ADJ ENVIRONMENT]
COMPENSATION LOW LIMIT=6
COMPENSATION HIGH LIMIT=3
COMPENSATION MINIMUM=0.1
EDGE DETECT LIMIT=90
EDGE DETECT LIMIT(%)=50
COMPENSATION LIMIT(896)=0.6
COMPENSATION HIGH LIMIT(896)=1.3
COMPENSATION LIMIT(640)=0.6
COMPENSATION HIGH LIMIT(640)=1.3
COMPENSATION LOW LIMIT(384)=0.3
COMPENSATION HIGH LIMIT(384)=1.3
COMPENSATION LOW LIMIT(128)=0.3
COMPENSATION HIGH LIMIT(128)=1.3
SAVE DIRECTORY=E:\HC_MURA_SAVE
MEASURE AREA RATIO(H)=0.002
CUC EEP SLOPE MAX=20
CUC EEP SLOPE MIN=-20
MURA GAIN LIMIT=0.008
MURA GAIN LIMIT ENABLE=1
CUC EEP GAIN UPPER LIMIT=70
CUC EEP GAIN LOWER LIMIT=-70

Appendix

Adobe Acrobat Document

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>Eep_L2067885B_L2067885B$6100459_TCon(CUC)ReadEep.eep
>   : T-con stored data
TCONのEEPROMから、ベリファイ用に読み出したCUCデータ

>Eep_L2067885B_L2067885B$6100459_TCon.eep
>   : T-con stored data
治具ソフトの途中で作られるムラ補正データの中間データ。

>Eep_L2067885B_L2067885B$6100459_TConReadEep.eep
>   : T-con stored data
TCONのEEPROMから、ベリファイ用に読み出したムラ補正データ。

>feedbackRGB_L2067885B$L2067885B$6100459_1.csv
>   : CUC adjustment data ? or RGB measured data?
>   : CUC補正値ですか？　あるいは　XYZの測定値比率ですか？数値の意味を教えて下さい。
R/G/BごとのCUC補正量です。

hokan_data_L2067885B_L2067885B$6100459_20151219071229.csv
  : Mura adjustment data? Or Luminance measured data?
  : Mura補正値ですか？　あるいは　RB輝度とGの割合ですか？数値の意味を教えて下さい。
ムラ補正量です。ムラなので、W色です。

>L2067885B$L2067885B$6100459_CUC.eep
>   : CUC adjustment NVM data
ソースに見当たりませんでしたが、CUCの補正データだと思います。

>MesData128_L2067885B_L2067885B$6100459_20151219071229.bin
>   : raw measured data by camera
>MesData384_L2067885B_L2067885B$6100459_20151219071229.bin
>   : raw measured data by camera
>MesData640_L2067885B_L2067885B$6100459_20151219071229.bin
>   : raw measured data by camera
>MesData896_L2067885B_L2067885B$6100459_20151219071229.bin
>   : raw measured data by camera
>MesData1023_L2067885B_L2067885B$6100459_20151219071229.bin
>   : raw measured data by camera
128, 384, 640, 896, 1023 / 1023における、カメラの計測データ W色を撮影