

Technical note T135: Fusion overlap

PGI Dimension – Production Interface (PI)

Calculating the maximum overlap for fused measurements

Lucy Cooper, Applications Engineer

Introduction

Fused measurements are used for measuring steep sided samples, samples with a very large sag and ones which have a very large diameter. The Production Interface (PI) requires the operator to input an associated overlap value. This is the region over which profile fusion takes place. This technical note shows how to calculate the maximum overlap. This is particularly important when we are dealing with the measurement of small samples, where the stylus tip has limited free movement and could otherwise collide and be damaged. Note that for some samples an overlap value smaller than the maximum may be more suitable.

Finding the ‘Overlap’ angle

The following formula can be used to calculate the maximum safe overlap angle:

$$OL_{max} = ST_{max} - TU \text{ angle} - 5 \text{ degrees}$$

Where:

OLmax	is the maximum safe overlap in degrees
STmax	is the maximum slope that the stylus can measure in degrees
TU angle	is the traverse unit angle in degrees

Example

For example, if the TU angle is 10 degrees and the maximum angle the stylus can measure is 45 degrees, then:

$$OL_{max} = 45 - 10 - 5 = 30 \text{ degrees}$$

Finding the ‘Overlap’ in millimetres

To find the overlap value in millimetres (mm) as required by the PI, the procedure is as follows:

- 1 Enter the design coefficients into the PI and view the design profile (Figure 1)
- 2 Increase the value of ‘X’ in the cursor box until ‘gradient’ reaches the OLmax angle (Figure 2)
- 3 Note the ‘X’ value in the cursor box (Figure 2)
- 4 Double the ‘X’ value to find the maximum overlap and enter this in the PI in mm (Figure 3)

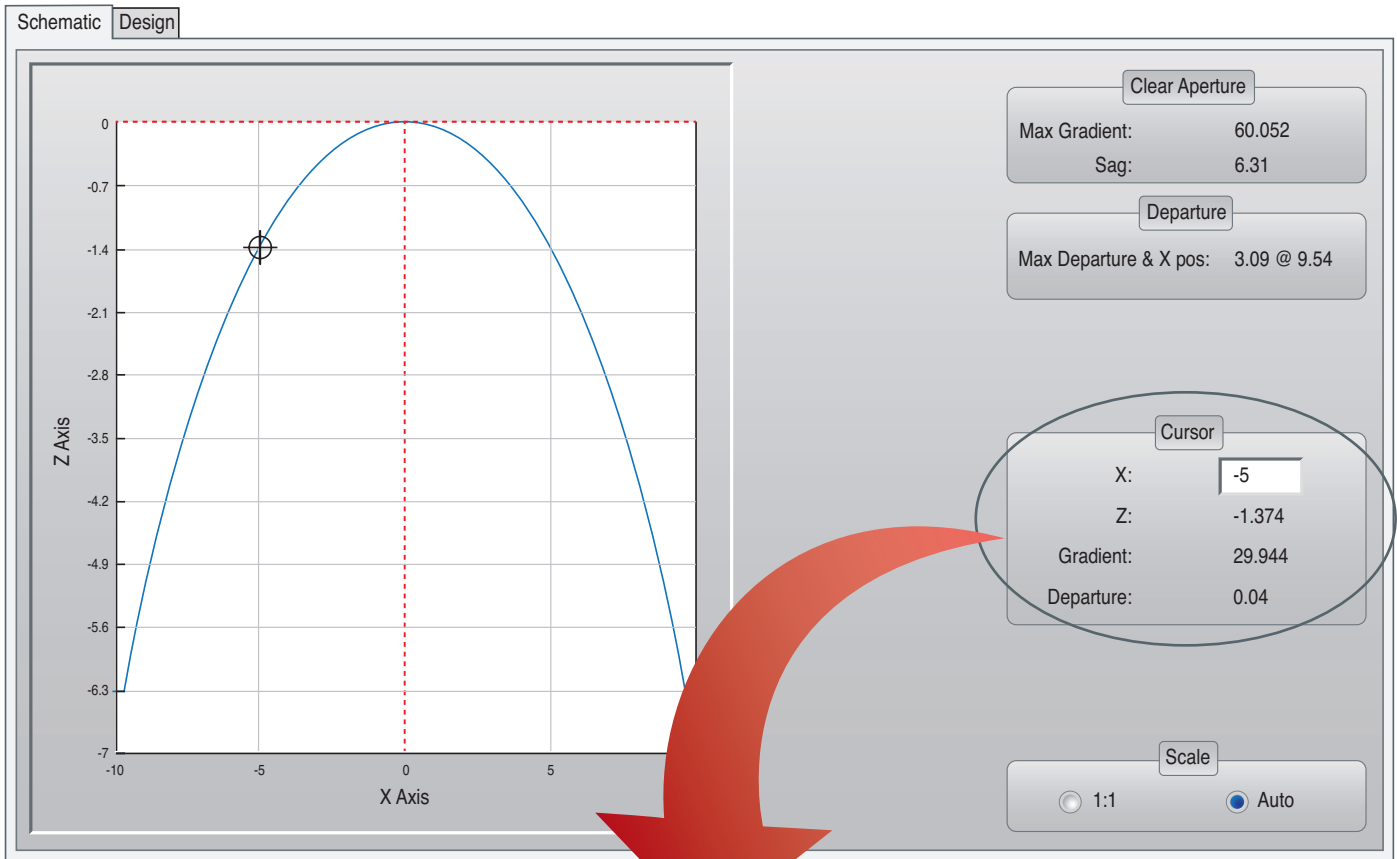


Figure 1 and 2:
The 'Cursor' box is used to find the 'X' value where the gradient is 30

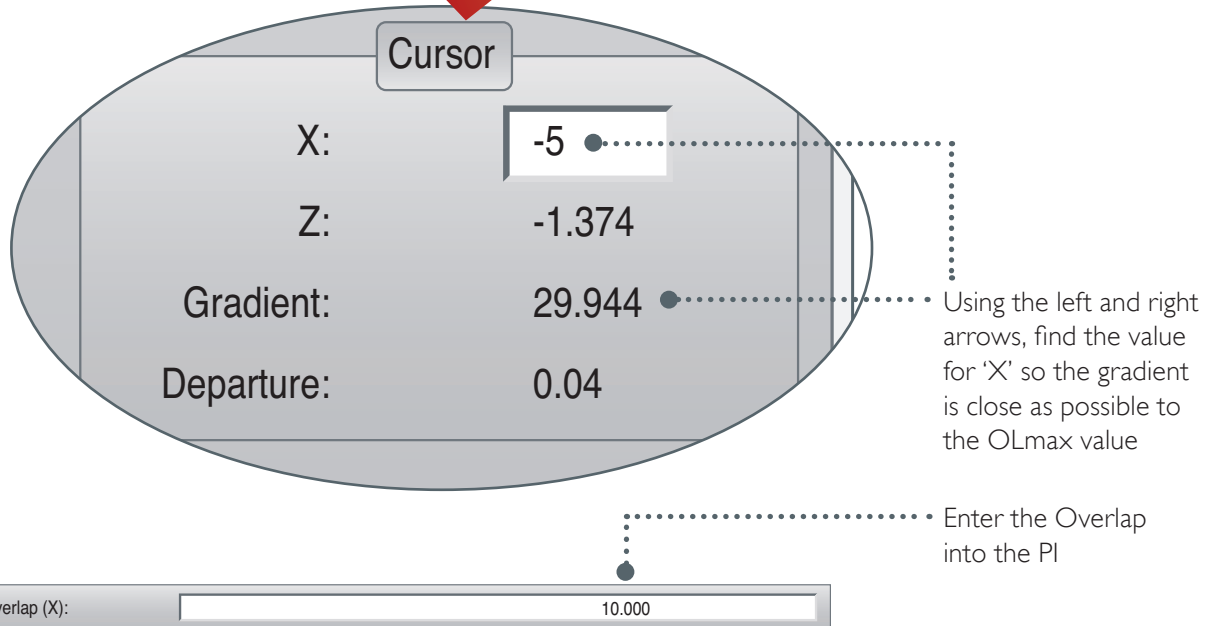


Figure 3: The overlap value entered into the production interface

-  **Taylor Hobson UK**
(Global Headquarters)
PO Box 36, 2 New Star Road
Leicester; LE4 9JD, England

Tel: +44 116 276 3771
taylor-hobson.sales@ametec.com
-  **Taylor Hobson France**
Tel: +33 130 68 89 30
taylor-hobson.france@ametec.com
-  **Taylor Hobson Germany**
Tel: +49 611 973040
taylor-hobson.germany@ametec.com

-  **Taylor Hobson India**
Tel: +91 80 67823200
taylor-hobson.india@ametec.com
-  **Taylor Hobson Italy**
Tel: +39 02 946 93401
taylor-hobson.italy@ametec.com
-  **Taylor Hobson Japan**
Tel: +81 36809 2406
taylor-hobson.japan@ametec.com
-  **Taylor Hobson Korea**
Tel: +82 31 888 5255
taylor-hobson.korea@ametec.com

-  **Taylor Hobson China Beijing Office**
Tel: +86 10 8526 2111
taylor-hobson.beijing@ametec.com
-  **Taylor Hobson China Shanghai Office**
Tel: +86 21 58685111-110
taylor-hobson.shanghai@ametec.com
-  **Taylor Hobson Singapore**
Tel: +65 6484 2388 Ext 120
taylor-hobson.singapore@ametec.com
-  **Taylor Hobson USA**
Tel: +1 630 621 3099
taylor-hobson.usa@ametec.com