Use of **DANGER, WARNING, CAUTION, and NOTE**

This publication includes, **DANGER, WARNING, CAUTION, and NOTE** information where appropriate to point out safety related or other important information.

**DANGER**  
Hazards which could result in severe personal injury or death

**WARNING**  
Hazards which could result in personal injury

**CAUTION**  
Hazards which could result in equipment or property damage

**NOTE**  
Alerts user to pertinent facts and conditions

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Chapter 1 Scaling Profibus Measuring Values

1.1 About this Supplement

To improve the Profibus resolution, the profbus scaling function has been changed.

This supplement explains the new Profibus function for improved resolution and necessary changes in the Profibus master to adapt to changes in Tension Electronics PFEA112.

The new scaling function is valid for SW-version 1.8 and higher.

This supplement can be used together with all language versions of User Manual, Web Tension Systems with Tension Electronics PFEA112 3BSE029380R00xx.

1.2 Miscellaneous Menu

Use this menu for scaling Profibus measuring values.

Figure 1-1. Profibus Scaling
1.2.1 Profibus

- Profibus On/Off
  The Profibus can be enabled or disabled.
- Profibus Address?
  If the Profibus is enabled, the Profibus address must be set in the range 000 - 125.
- Profibus Measuring Range?
  If the Profibus is enabled, the Profibus Measuring Range and load division can be set.

Read more about the Profibus in User manual for PFEA112, Section 3.13.

1.2.2 Scaling of Profibus Measuring Values

The Profibus values can be scaled in two ways:

- **Default Scaling** – the scaling is only depending on load cell nominal load.
- **User defined Scaling** – the scaling of the Profibus values can be set by the user.

1.2.2.1 Default Scaling

This is exactly the same function as in previous software versions, 1.7 and earlier. Older units can thus be replaced by new units with SW1.8 and later without changing Profibus master setup using default scaling. The value of the least significant bit is defined as Load Division.

The Load Division is set based on Measuring range

<table>
<thead>
<tr>
<th>Profibus Measuring Range</th>
<th>Value of least significant bit, Load Division (Resolution)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0.001 \times 2 \times F_{\text{nom}} \times 5000$</td>
<td>$0.001 \times 2 \times F_{\text{nom}}$ [(1)]</td>
</tr>
</tbody>
</table>

(1) $F_{\text{nom}}$ = load cell nominal load

Example for 1 kN load cells:

With 1 kN load cells the value of the least significant bit is: $0.001 \times 2 \times 1000 = 2$ N

Measuring range: $5000 \times 2 = 10 000$ N
1.2.2.2 User Defined Scaling

The Profibus Measuring Range and Load Division can be adjusted to user needs.

**Profibus Measuring Range**

Profibus Measuring Range *(estimated web tension during normal operation)* is a parameter entered by the user. After the user has changed the Measuring Range value, changing Load cell nominal load does not affect the Profibus scaling. The value of the least significant bit is defined as Load Division.

**Load Division**

Load Division is the resolution that will be used on Profibus. The Load Division value is calculated by PFEA112 and depends on the set measuring range.

The measuring range is divided into a limited number of divisions in the range 2001 - 5000. The Load Division value = one division, contains only one significant digit (1, 2 or 5).

The Profibus can handle max. –32768 to +32767 (2^16) divisions.

Example 1:

a. Profibus Measuring Range (set by user) = 15 500 N *(estimated web tension during normal operation)*

b. Load Division calculated by PFEA112 = 5 N *(value of least significant bit on Profibus)*

c. Profibus Measuring Range/Load Division = 15500/5 = 3100 *(the measuring range is divided into 3100 divisions)*

Example 2:

If the Load Division, 5 N, in Example 1 is not sufficient, the Load Division can be adjusted. This can be done by setting (decreasing) **Measuring Range** in the Miscellaneous Menu to a value that gives a sufficient Load Division (resolution).

a. Measuring Range = 9000 N *(New, lower setting on measuring range)*

b. New Load Division calculated by PFEA112 = 2 N *(New value of least significant bit on Profibus)*

With the setting 9000 N in PFEA112, the Profibus measuring range 0 – 15500 N (divided into 7750 divisions) can still be used, now with the Load Division (resolution) 2 N.

Normally, there is no need to set the measuring range lower than 1/3 of the estimated web tension during normal operation.

The max. value that can be transmitted via Profibus, for a given Load Division, is:

- Max. value = Load Division x 32767

**NOTE**

After the user has changed the Measuring Range value, the only way to return to Default scaling, is to use the function Set Factory default in the Miscellaneous Menu.