## Weight function in Caliber

This article describes how to create and use weight function in Caliber.

1) Creating new function.

From top menu labeled "Window" select "User functions" module. Press "New" button to activate "New function" panel. Fill in "Function name" and "Unit" as shown in picture. Set "Quantity" to "Relative" option. Press "Save" button.

|                                |                      |                 |               | C New function | ×        |
|--------------------------------|----------------------|-----------------|---------------|----------------|----------|
| Cliser functions "c:\nrogram ( | iles\meatest\caliber | 2011 en ung\da  | ta\default    | Function name  | Unit     |
| Evention (Program              |                      | Lorr ch opg (aa |               | WEIGHT         | g        |
| WEIGHT                         | Function name        | Unit            | Has polarity  | Parameter name | Unit     |
|                                |                      | g               | i nuo polanty |                | <b>A</b> |
|                                | Quantity             | Evaluation      | _             |                |          |
|                                | Relative             | C Relative      |               |                |          |
|                                | C Absolute           | Absolute        |               |                |          |
|                                | BMC [%]              |                 |               |                |          |
|                                |                      |                 |               |                |          |
|                                |                      |                 |               |                |          |
|                                | Parameter name       | Uni             |               |                |          |
|                                |                      |                 |               |                | <b>V</b> |
|                                |                      |                 |               | Add            | Delete   |
|                                |                      |                 | 7             |                |          |
|                                |                      |                 |               |                | Canad    |
|                                |                      |                 |               | UK             | Cancer   |

2) Creating new instrument card of WEIGHT SET.

This card will serve as source for "WEIGHT" function. Press "New" button, fill in instrument name "WEIGHT\_SET", press "OK" button.

| C Instrument card |                                    |       |               |                         |
|-------------------|------------------------------------|-------|---------------|-------------------------|
|                   | Remote control                     | 7     |               |                         |
| Instrument        | Source<br>-Specification<br>Limits | Meter | Switch<br>Rem | Global<br>note control  |
| WEIGH             | нт_sет)<br>жс                      | ancel |               | ro<br>Set<br>deasure    |
|                   | Connection sch                     | eme   |               | Dutput on<br>Dutput off |

Select "Source" page and add newly created function "WEIGHT" (by pressing right mouse button over status window).

| C Instrument card "weight_set.dev*" |   |       |        |  |
|-------------------------------------|---|-------|--------|--|
|                                     | Remote control  | •     |        |  |
| Function WEIGHT                     | Source  | Meter | Switch | Global   |
| WEIGHT                              | Specification<br>Limits<br>% of reading<br>% of range<br>Absolute |       |        | note control<br>tiplier<br>used<br>Set<br>Measure<br>Dutput on |
|                                     | Connection sch  | eme   |        |  |

Now add ranges to "WEIGHT" functions. For example "10g", "100g", "1000g" as show in following picture. For every range fill in specification.

| C Instrument card "weight_set.dev*"                              |   |       |                      |  |
|--|---|-------|----------------------|--|
|  | Remote control  | •     |                      |  |
| Range WEIGHT \10=<=10 g<br>10=<=100 g<br>100=<=100 g<br>1=<=1 kg | Source Specification Limits % of reading % of range Absolute 0.01 | Meter | Switch<br>Ren<br>Mai | Global<br>note control<br>tiplier<br>used<br>ro<br>Set<br>Measure<br>Dutput on<br>Dutput off |
|  | Connection sch  | eme   |                      |  |

The last step is to define macros. In our example, only manual control will be used. So define "Set" macro (set) for every range:

| C Instrument card "we   | eight_set.dev*"   |   |        |        |   |
|-------------------------|---|---|--------|--------|---|
|                         |   | Manual  | •      |        |   |
| Range<br>10=<=10 g      | WEIGHT \ 10=<=10 g  | Source  | Meter  | Switch | Global  |
| 100=<=100 g<br>1=<=1 kg | Calibra<br>Calibra<br>C Auto<br>C Auto<br>C Nor<br>Messag<br>Use 10<br>Delay (s | set<br>tion message<br>o (default)<br>er text<br>he<br>oge<br>og weigh<br>0.0 |        |        | Manual<br>iplier<br>used v<br>Set<br>Measure<br>Dutput on<br>Dutput off |
|                         | Shov  | w always<br>OK  | Cancel |        |   |



Instrument card is finished, press "Save" button.

| C Instrument card "weight_set.dev*" |  |       |        |   |
|-------------------------------------|--|-------|--------|---|
|                                     | Manual   | •     |        |   |
| Range         WEIGHT\10=<=          | Specification<br>Specification<br>Limits<br>% of reading<br>% of range<br>Absolute<br>0.01 | Meter | Switch | Global<br>Manual<br>tiplier<br>tused •<br>Set<br>Measure<br>Output on<br>Output off |
|                                     |  | eme   |        |   |

3) Creating new instrument card of WEIGHT SCALE.

| Instrument card "weighing_scale.dev*" |   |       |        |   |  |
|---------------------------------------|---|-------|--------|---|--|
|                                       | Manual  | •     |        |   |  |
|                                       | Source  | Meter | Switch | Global  |  |
| WEIGHING_SCALE                        | Specification<br>Limits<br>% of reading<br>% of range<br>Absolute |       |        | Manual<br>tiplier<br>tused v<br>Set<br>Measure<br>Output on |  |
|                                       | Connection sch  | ieme  |        |   |  |

Select "Meter" page on the right side of screen. Add newly created function "WEIGHT" (by pressing right mouse button over status window):

| CInstrument card "weighing_scale.dev*" |   |                                   |        |                                     |
|--|---|-----------------------------------|--------|-------------------------------------|
|  | Manual  | •                                 |        |                                     |
| Function WEIGHT                        | Source<br>Specification<br>Limits<br>% of reading<br>% of range<br>Absolute<br>Digits error<br>Connection sch | Meter<br>Full digits<br>One digit | Switch | Global<br>Manual<br>tiplier<br>used |
|  |   |                                   |        |                                     |

Add range under "WEIGHT" function (in our example 2kg range):

| C Instrument card | "weighing_scale.dev*" |  | 1         | Ū      |  |
|-------------------|-----------------------|--|-----------|--------|--|
|                   |                       | Manual   | •         |        |  |
| Range             | WEIGHT\0=<=2 kg       | Source   | Meter     | Switch | Global                                 |
| 0=<=2 kg          |                       | Specification<br>Limits<br>% of reading<br>0.1<br>% of range<br>0.05<br>Absolute<br>Digits error<br>Connection sch | One digit |        | Manual<br>Ittiplier<br>t used v<br>Set |
|                   |                       |  |           |        |  |

Fill in also specification for this range.

Last step is to define "Set" macro. This instrument will be operated only manually and no interaction is required:

| <b>C</b> Instrument card "weighing_sc | ale.dev*"  |        | _ 🗆 X                                 |
|---------------------------------------|--|--------|---------------------------------------|
|                                       | C Manual set   |        |                                       |
| Function                              | Calibration message  | Switch | Global                                |
| WEIGHT                                | C Auto (default)<br>User text<br>None<br>Message<br>Delay [s]<br>0.0 =<br>Show always<br>OK Cancel |        | Manual<br>ttiplier<br>t used v<br>Set |



| C Instrument card | l "weighing_scale.dev*" |  |                          |        |                   |
|-------------------|-------------------------|--|--------------------------|--------|-------------------|
|                   |                         | Manual   | •                        |        |                   |
| Range             | WEIGHT\0=<=2 kg         | Source   | Meter                    | Switch | Global            |
| 0=<=2 kg          | <u>~</u>                | Specification<br>Limits<br>% of reading<br>0.1<br>% of range<br>0.05 | Full digits<br>One digit |        | Manual<br>tiplier |
|                   | y<br>                   | Absolute<br>Digits error<br>Connection sch                           | neme                     |        | Set               |

## 4) Creating testing procedure.

Now we have two instrument cards created and we can form calibration procedure. Press "New" button to activate "Procedure Wizard". Fill in "Procedure name" and add instruments. First of them "WEIGHING SCALE" as UUT:

| C Procedure Wizard                                      | Instrument configuration | ×                   |
|---|--------------------------|---------------------|
| Instruments Functions Ranges Values Inapplicable Values | Instrument               | Instrument use      |
| Selected instruments                                    | From database            | UUT                 |
| WEIGHING_SCALE  |                          | Instrument response |
|   | METRIX MX 56             | Manual 💌            |
| Wittend rules   | M1X3282<br>Mx24b         |                     |
| default   | NA2250T                  | Instrument control  |
| Add   | P110                     | Manual 💌            |
| Remove  | Platinum<br>PU500        | Connected to        |
|   | Shunt 10miliOhm          | Master bus          |
| OK Cancel   | SI7063                   |                     |
|   | WEIGHING SCALE           |                     |
|   | WEIGHT_SET               | OK Cancel           |

Subsequently "WEIGHT\_SET" as Standard & Source:

| C Procedure Wizard |                     |                             |        |                     | × | 🔋 Instrument configuration   |  |  |  |  |
|--------------------|---------------------|-----------------------------|--------|---------------------|---|--|--|--|--|--|
| Instruments        | Functions           | Ranges                      | Values | Inapplicable Values |   | Instrument   | Instrument use   |  |  |  |
| Vizard rules       | Selected<br>WEIGHIN | instruments<br>IG_SCALE UUT |        | Add<br>Remove       |   | <ul> <li>From database</li> <li>Without card</li> <li>METRIX MX 56</li> <li>MTX3282</li> <li>Mx24b</li> <li>NA2250T</li> <li>P110</li> <li>Platinum</li> <li>PU500</li> <li>Shunt 10mili0hm</li> <li>SI7063</li> </ul> | Standard & Source  Standard & Source  Instrument response  Manual  Instrument control  Manual  Connected to  Master bus  X |  |  |  |
|                    |                     |                             |        |                     | ] | Thermocouple<br>WEIGHING_SCALE<br>WEIGHT_SET   | OK Cancel  |  |  |  |

Wizard automatically selects the only function "WEIGHT" and range "2kg". As there are no "Wizard rules" for this function, we should define values (calibration points) here:

| C Procedure Wizard ( | ×                         |          |             |                         |
|----------------------|---------------------------|----------|-------------|-------------------------|
| Instruments 2        | Instruments 2 Functions 1 |          | Values 2    | Inapplicable Values     |
| Function<br>WEIGHT   | Range<br>0=<=2 kg         | Selected | values<br>g | Add<br>Modify<br>Remove |
|                      |                           |          | ОК          | Cancel                  |

By pressing "OK" button new procedure will be automatically created and procedure can be tested. No real instrument is needed, because all operation is done manually.

|   | C Procedure "c:\pr   | ogram files\n | neatest\caliber 2011                  | en upg\data\weighing_                                       | scale.pro*" |       |                    |                | _ 🗆     | ×    |
|---|--|---------------|---------------------------------------|---|-------------|-------|--------------------|----------------|---------|------|
|   | Procedure WEIGHING_SCAU<br>Version: 1.00<br>Author:<br>E-mail: |               | e e e e e e e e e e e e e e e e e e e | <mark>iGHT_SET</mark> <mark>VEIGHING</mark><br>ual 2 Manual | _SCAL<br>1  |       | r =                | Camera<br>! :i | ja<br>D |      |
|   |  |               |                                       |   |             |       | 2) 1000<br>3) 1000 |                |         | 키    |
|   |  |               | <u> </u>                              |   |             |       | 4) 1000            |                |         |      |
| ľ |  |               |                                       |   |             |       | 6) 1000<br>7) 1000 |                |         |      |
| ŀ |  |               |                                       |   |             | ~     | 1771000            |                |         |      |
| l | Function   | Range         | Standard                              | 001   | Deviation   | %spec | Allowed            | Uncertain      | ity Sym | IDOI |
| l | WEIGHT   | 2 kg          | 0.100002 kg                           | 0.100000 kg   | -0.002 g    | 0     | 1.100 g            | 0.023 g        | ok      | 1    |
| l | VVEIGHT  | 2 kg          | 1.00000 kg                            | 1.00000 kg  | -0.00 g     | 0     | 2.00 g             | 0.23 g         | ok      |      |
|   |  |               |                                       |   |             |       |                    |                |         | 4    |