



HMs DIY GUIDANCE

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1) INTRODUCTION

HMs DIY is a Garmin IQ-Datafield which enables you to create your own design for your Garmin device.

First you create your layout with the Designer tool on your PC (Windows only). You can see the layout immediately in the preview window - step by step. When you are happy with your creation, transfer the layout to your Garmin device using Garmin Connect Mobile or Garmin Express.

The possibilities HMs DIY offers are almost unlimited. All fonts and font sizes available on the Garmin device can be used, there are countless types of data that can be displayed, various graphical elements, statically and dynamically changeable colors are available. In addition to general data elements, there are also elements available specifically for running and cycling.

It is possible to create a full display layout that contains all data and graphics. It is also possible to create a single data field that can be displayed in combination with original Garmin data fields.

All Garmin devices that allow IQ data fields are supported.
Both the metric and imperial measurement system is supported.

It must be noted, however, that different Garmin devices have different memory sizes. Not everything can be displayed on every device.

Some layout examples:



2) INSTALLATION

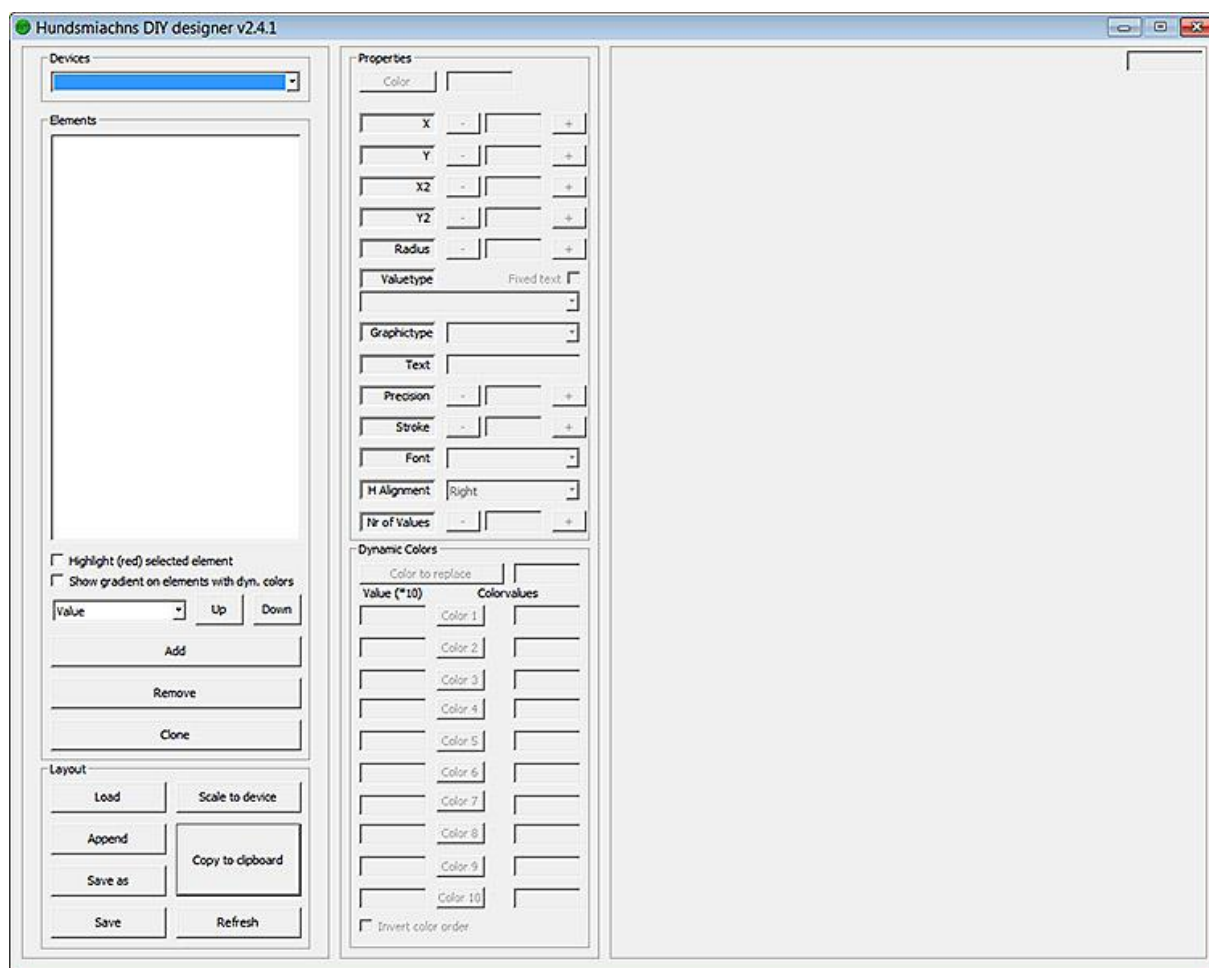
The installation is done in 2 steps. On your Windows PC install the Designer program, and on your Garmin device install the IQ data field "HMs DIY".

2a) Installation of the Designerprogram on your WIN-PC

Visit the Garmin IQ-Store on the Internet and search there for "HMs DIY" or go directly to the page of [HMs DIY](#). Here you will find a download link to a ZIP-file. Download this ZIP file and unzip it. You will find a file "fonts.txt", a collection of examples and the Designer program itself, which is hidden in another ZIP-file and is named "HundsmiachnDIYDesigner.exe" .

There is no need to run a setup-program - simply copy the executable and the font.txt file to a new created folder of your choice.

Now the designerprogram is ready for use!



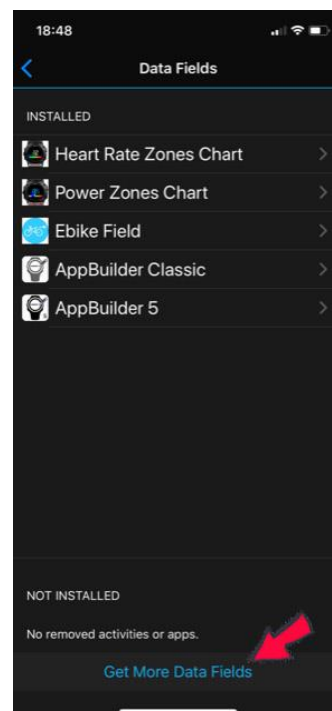
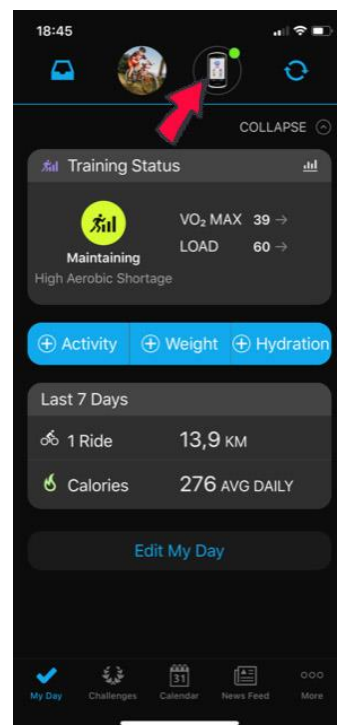
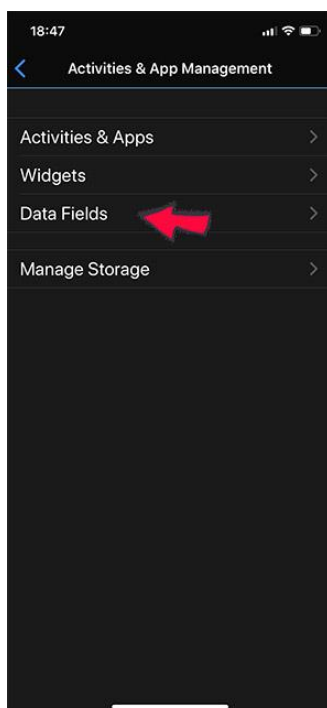
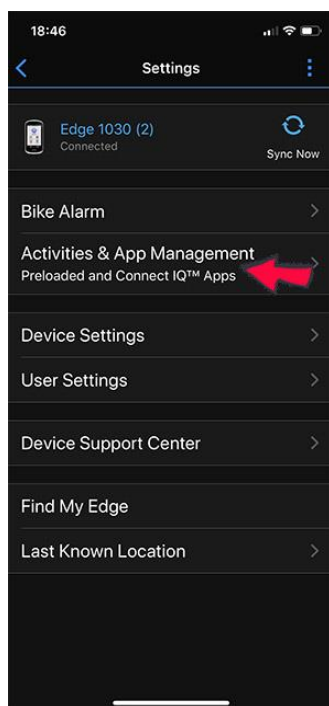
2b) Installation of the IQ-DIY datafield on your Garmin device

The installation of the IQ-DIY data field on your Garmin device can be done in 2 ways: using Garmin Connect Mobile or using Garmin Express.

- Installation with Garmin Connect Mobile:

On your mobile-phone start Garmin Connect Mobile, turn on your Garmin device and wait until the connection was established.

On your mobile phone tap on the device icon with the green dot

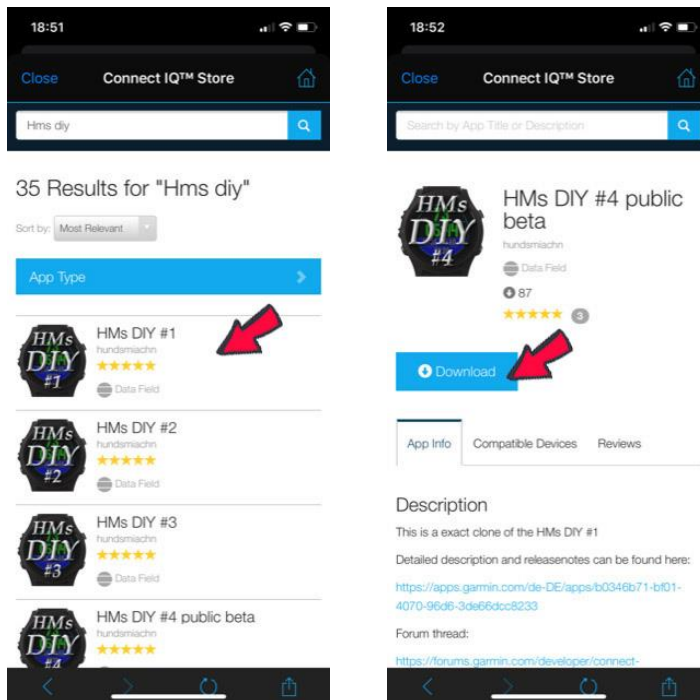


Tap on "Activities & App Management"

Tap on "Data Fields"

At the bottom tap on "Get More Data Fields"

Search for "HMs DIY" and you will find 4 clones of this datafield.



Tap on the desired clone (#1 if it is your first HMs DIY) and tap the Download-button.

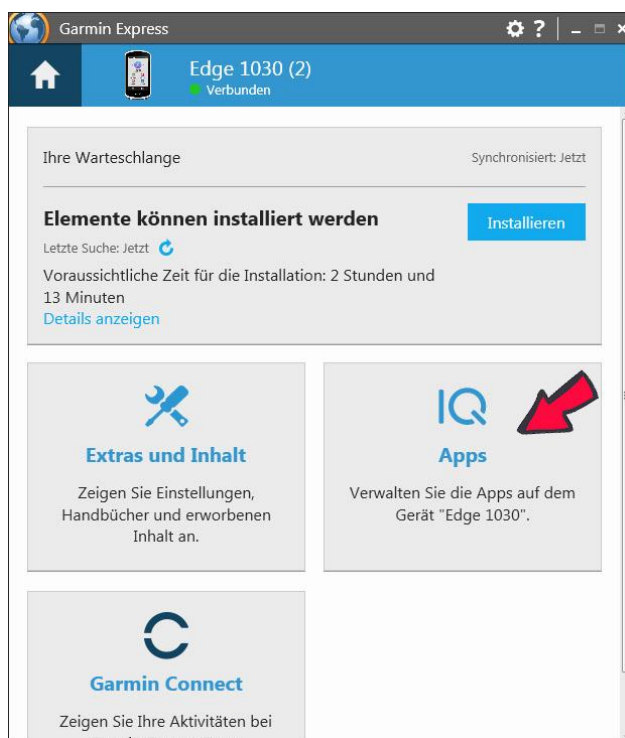
"Accept Terms"

On the next screen "Allow" the access.

The data field now will be installed on your device.

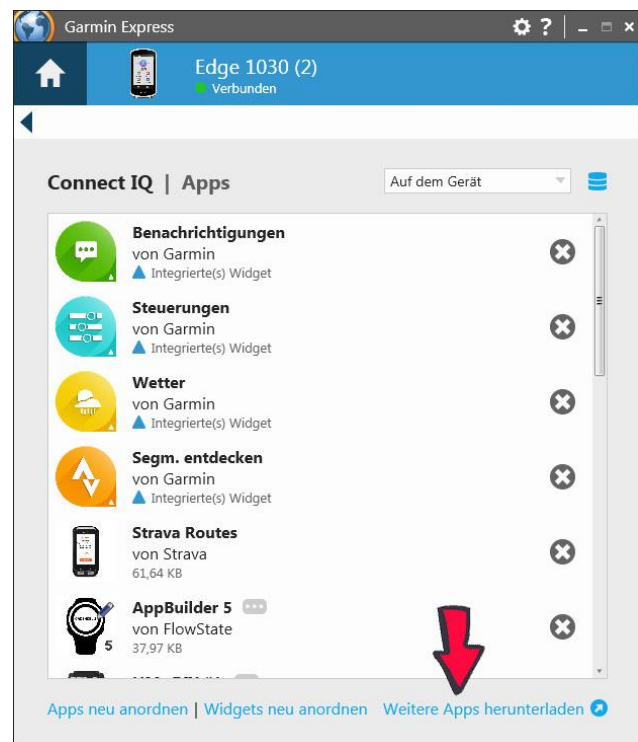
- Installation with Garmin Express:

Connect your device to your PC, start Garmin Express, tap on the device icon



Tap on "IQ Apps"

Tap bottom right on "Get More Apps"



Now you will be redirected to the IQ Store, where - like during the installation with Garmin Connect Mobile - (see there) - you search the data field "HMs DIY" and start the download.

3) DESIGNER TOOL

Before we start with the description of the Designer tool, we would like to draw your attention to the file "fonts.txt". This file must be located in the same directory as the Designer tool itself. It contains all information about the fonts used in the Designer tool.

Unfortunately Garmin does not publish the fonts that are used in their devices. They are not available as Truetype-fonts (ttf). So similar fonts had to be found in order to display text and digits reasonably satisfactorily. This is the reason why there is a certain discrepancy between the preview in the designer and the actual appearance on the device.

In the Designer tool there are 9 replacement fonts built in, which can be adjusted as best as possible.

In the file "fonts.txt" a set of fonts is already defined for all devices. However, this can/must be further refined by the user by editing the file. How to do this will be explained in chapter "[Fontmapping for your device](#)".

To start the Designer tool simply double-click on the Designer-icon.

For better explanation <Load> from the examples-collection:

FR935 -> example_FR935



(1) - Devices:

Choose your device.

(2) - Elements:

An area that defines elements:

List of elements:

shows all elements which are created for this layout. For the highlighted element you can see all attributes in section (4) or (5).

Checkbox Highlight:

When checked, the highlighted element in the element-list will appear in red color in preview (6).

Checkbox Show Gradient:

When checked, the highlighted element in the element-list will appear in gradient-color in preview (6), but only if the element is dynamic colored.

Element type selection box: 4 element-types are available

Value: In the element list, values are marked with the letter "V". These are values like Speed, Pace, Time, Power etc.

Graphic: In the element list, graphic elements are marked with the letter "G". These are elements like Line, Circle, Rectangle etc.

Dynamic Color: In the element list, dynamic colors are marked with the letter "C". These defines colors and color-ranges for Values and Graphic Elements.

Separator: are elements that serve the better overview.

Up / Down Button:

Moves the highlighted element up or down in the element-list.

Each element represents a layer. The further down an element is in the list, the more it is in the foreground.

Add Button:

Adds an element below the current position in the element list. The type of the element must be selected before (see Element type selection box).

Remove Button:

Removes the highlighted element in the element list.

Clone Button:

Clones the highlighted element in the element list and sets the new element below the current position in the element list.

(3) - Layout:

Load button:

Loads a stored layout.

Append button:

Appends a stored layout to the loaded layout.

Save / Save as button:

Saves a layout.

Scale to device button:

If you change the device (1) while a layout is loaded, this button will scale the layout to fit the new chosen device.

Refresh button:

Refreshes the layout-preview in section (6).

Copy to clipboard button:

Creates the layout-string for the created layout and copies that string to the clipboard. This is the last step in creating a layout. The copied string has to be pasted into the string-field in the Setup of the IQ-datafield on the device (see "[Transferring your layout to your Garmin device](#)").

(4) - Properties:

An area that defines the properties of elements.

Different element types have different properties. Therefore some are enabled and some are disabled.

Color:

Sets the color for the element.

For using dynamic colors see "[Using dynamic Colors](#)".

Please be aware that most devices cannot display every color value exactly.

X / Y, X2 / Y2:

Are the coordinates where the element is set.

Radius:

Defines the Radius of circles and arcs.

Valuetype:

For values: choose one of the drop-down list (Speed, Time...)

For Graphic elements: choose the valuetype which the Graphic Element is connected to (to change colors or to draw a progress bar).

Fixed text:

Check this box if you want to set a label. Set Valuetype to "none".

Graphic type:

Select the type of the Graphic element (see "[Graphic Elements](#)")

Text:

If you checked "Fixed text" to create a label: type in the text here

If you have chosen a value like Speed or Time: define the format-mask here:
you can add text to the mask of variables - for example:

Temperature: "\$V °C" will display: "12 °C"

Distance to go: "to go: \$V km" will display: "to go: 23 km"

(you can set decimal places - see next step)

There are different masks for Time available - see "[Time Formats](#)".

If you choose "Separator": type in the Separator-text.

Precision:

Defines the number of decimal places.

Stroke:

Defines the thickness of all kind of lines (Line, Rectangle, Circle, Arc).

Font:

Defines the font you will use for texts and variables.

H Alignment:

Defines the text-alignment: center, left, right.

Nr. of Values:

Defines the sample rate for variables in seconds. According to that figure the variable will be averaged for the given time.

Set Nr. of Values to 3 if you will display 3s Power.

(5) - Dynamic Colors:

An area that defines the color(s) of elements.

For more details see: "[Using Dynamic Colors](#)".

(6) - Preview of your design:

Here you can see if your layout meets your expectations - more or less WYSIWYG.

(7) - X / Y indicator:

If the mousepointer is inside the area of the preview-workspace - this will indicate the mousepointer's-position.

Click on the current element in the element-list and then apply the X and Y values with <Ctrl> + <Shift> + A.

The values for X2 and Y2 are applied with: <Ctrl> + <Shift> + Y.

3a) GRAPHIC ELEMENTS

If you choose "Graphic" in the element type selection box in area (2) you can choose one of the following graphic elements in the Graphic type selection box in area (4):

The following applies to all graphical elements:

The color is selected under "Color".

If the color is to change depending on a value (e.g. Speed), this value must be selected under "Valuetype" and an associated dynamic color element must be created (see "[Using Dynamic Colors](#)").

LINE:

A line is defined by its starting point X/Y and by its end point X2/Y2.

The line thickness is selected by "Stroke".

CIRCLE:

A circle is defined by its center X/Y and by its radius.

The line thickness is selected by "Stroke".

CIRCLE FILLED:

A circle filled is defined by its center X/Y and by its radius.

RECTANGLE:

A rectangle is defined by its left/upper point X/Y and by its right/bottom point X2/Y2.

The line thickness is selected by "Stroke".

RECTANGLE FILLED:

A rectangle filled is defined by its left/upper point X/Y and by its right/bottom point X2/Y2.

RCT HOR. FILLED:

A rectangle horizontal filled is defined by its left/upper point X/Y and by its right/bottom point X2/Y2. The rectangle filled is to grow depending on a value (e.g. Speed). This value must be selected under "Valuetype" and an associated dynamic color element must be created. The minimum-value (rectangle is empty) and the maximum value (rectangle is filled completely) are defined in that dynamic color element (see ["Using Dynamic Colors"](#)).

A rectangle horizontal filled works like a progress bar and is always filled from left to right.

RCT VERT. FILLED:

A rectangle vertical filled is the same as horizontal filled - but vertical filled.

A rectangle vertical filled works like a progress bar and is always filled from bottom to top.

ARC:

An arc is defined by its center X/Y, radius and by its start and end angel.

The line thickness is selected by "Stroke".

Zero degrees corresponds to the 3 o'clock position.

The degree indication may exceed 360 degrees.

The picture shows 2 arcs:

The grey one has Start angle = 384 degrees

and End angel = 336 degrees (defined from bottom to top).

Stroke = 20



ARC DYN. FILLED:

An arc dynamic filled is defined by its center X/Y, radius and by its start and end angel. It can act clockwise or anticlockwise.

The red arc in the picture is a dyn. filled arc. It has

Start angle = 383 degrees and End angel = 337 degrees (defined from bottom to top).

Stroke = 16

The red arc dyn. filled in that example grows corresponding to power.

No power, 0 Watt: the red arc is not visible.

300 Watt: the arc is completely filled - it acts like a gauge.

The minimum-value and the maximum value are defined in a dynamic color element (see ["Using Dynamic Colors"](#)).

3b) USING DYNAMIC COLORS

Dynamic colors are used to change the color of an element (Value, Text, Graphic) according to a valuetype on one hand, and on the other hand they are used to make dynamic filled graphic elements grow.

Besides the Value, Text or Graphic element, a corresponding Dynamic Colors element must be created.

Let us explain this with an example:

We want to give the figure for Heartrate different colors depending on its value:

60-100 bpm: grey
100-120 bpm: blue
120-140 bpm: green
140-160 bpm: orange
above 160 bpm: red

First we have to add a value-element,
Valuetype = Current heartrate,
set it to the right place X/Y.

Define any value as color, which otherwise
does not occur in the entire layout:
We'll use FFFFFA.

This color value has nothing to do with the
displayed color, but is the name of the
corresponding Dynamic Colors element.

Properties

Color: FFFFFFFA

X: 25, Y: 56, X2: , Y2: , Radius:

Valuetype: Curr. heartrate, Fixed text: ☐

Graphictype:

Text: \$V

Precision: 0, Stroke: 1, Font: XTINY, H Alignment: Left

Nr of Values: 1

Now we add a Dynamic Colors element.

As "Color to replace" - virtually the name of the Dyn. color element - we take the color value of the value element from above: FFFFFFFA.

And now we define the colors and the ranges for the colors.

- the biggest value on top!
- all values multiplied by 10!

60-100 bpm (600-1000): grey C0C0C0
(Values below 60 bpm are also displayed in grey)

100-120 bpm (1000-1200): blue 00FFFF

And on top:
above 160 bpm (above 1600): red FF0000

Value (*10)	Color	Colorvalues
1600	Color 1	FF0000
1400	Color 2	FF8040
1200	Color 3	00FF00
1000	Color 4	00FFFF
600	Color 5	C0C0C0
	Color 6	000000
	Color 7	000000
	Color 8	000000
	Color 9	000000
	Color 10	000000

☐ Invert color order

You see: there is a checkbox at the bottom: "Invert color order". Check this box if you give different colors to a Pace-value:

Pace values are set in seconds (x 10).
The maximum value is 65535. That means for time: $65535/10/60 = 109$ minutes.

See example from the layout "example_FR935".

Value (*10)	Color	Colorvalues
2700	Color 1	800080
3000	Color 2	FF0000
3300	Color 3	FF5500
3600	Color 4	00FF00
3900	Color 5	0055FF
4200	Color 6	FFFFFF
	Color 7	000000
	Color 8	000000
	Color 9	000000
	Color 10	000000

☒ Invert color order

Now let's make an example of a dynamic filled arc.
We want to grow an arc which corresponds to power.
See picture on page 12.

The red arc is empty at 0 Watt and is filled completely at 300 Watt:



First we have to add a Graphic element,
 Graphictype = Arc dyn. filled
 Valuetype = Current bikepower
 set it to the right place X/Y, radius, angles.
 Stroke = 16 (thickness of the arc)

Define any value as Color, which otherwise
 does not occur in the entire layout:
 We'll use F80002.

This color value has nothing to do with the
 displayed color, but is the name of the
 corresponding dynamic colors element.

The Properties dialog box shows the configuration for a dynamic graphic element. The Color is set to F80002 (red). The X and Y coordinates are 141 and 280 respectively. The Start angle is 383 and the End angle is 337. The Radius is 122. The Valuetype is set to (M) Current bike power. The Graphictype is Arc dyn. filled. The Text field is empty. The Precision is set to 1. The Stroke is 16. The Font is XTINY. The H Alignment is Right. The Nr of Values is 1.

Now we add a Dynamic Colors element.

As "Color to replace" - virtually the name of the
 Dyn. color element - we take the color value of
 the Graphic element from above: F80002.

And now we define the color
 and the range for the arc.

Notice:

- the biggest value on top!
- all values multiplied by 10!

0 Watt: the minimum value

300 Watt (3000): the maximum value

The arc is colored red F80000.

The minimum value needs not to be 0.

For a heartrate gauge you can set the minimum
 to 60 bpm (=600). That means: the arc stays empty till the heartrate exceeds 60
 bpm.

For temperature e.g. you can also set the minimum to minus degrees.

The same pattern applies to create a rectangle dyn. filled!

The Dynamic Colors dialog box shows the configuration for a dynamic color element. The Color to replace is F80002. The Value (*10) is 3000. The Colorvalues are defined as follows:

Value (*10)	Color	Colorvalue
3000	Color 1	F80000
0	Color 2	F80000
	Color 3	000000
	Color 4	000000
	Color 5	000000
	Color 6	000000
	Color 7	000000
	Color 8	000000
	Color 9	000000
	Color 10	000000

The Invert color order checkbox is unchecked.

3c) VALUE TYPES

There are nearly endless types of values available which can be added to a layout.

For the element "Value" you can choose the Valuetype from the dropdown-list in the Properties-area:

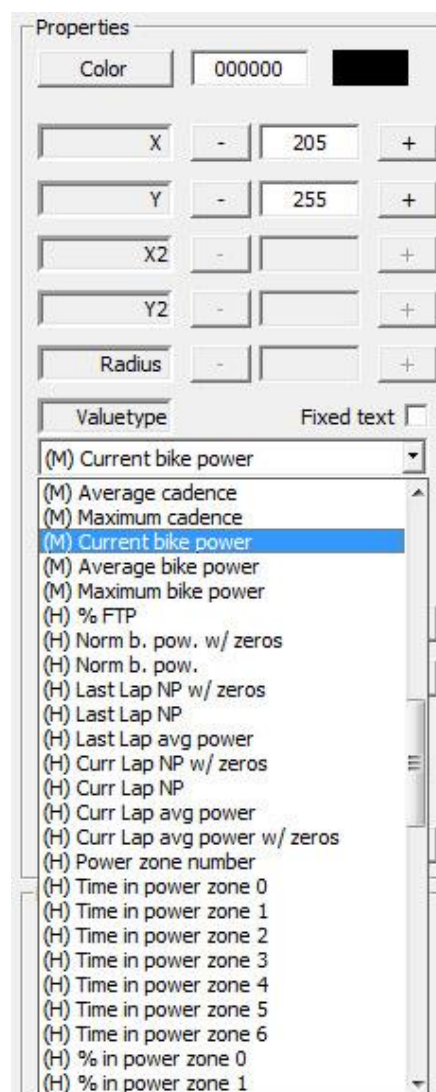
You will see - for the most of the valuetypes there is a specification in front of the name:

nothing: available on all devices.

(M): additionally available on devices with "medium memory".

(H): additionally available on devices with "high memory"

For more information see "[Appendix](#)".



Most of the value types are self-explanatory.

LIST OF VALUE TYPES:

-- None --

used for Fixed text (labels)

Name of destination

Name of next point

Clock time

Timer time

counts time when activity is running

Current pause time

starts when activity is paused, becomes 0 on restart

Elapsed time

counts time from start to end of an activity

Last lap time

Current lap time

ETA (curr.sp)

estimated time of arrival based on current speed

ETA (avg.sp)

estimated time of arrival based on average speed

Time to dest (curr. sp)

time to destination based on current speed

Time to dest (avg. sp)

time to destination based on average speed

ETA next p. (curr.sp)

estimated time to next point (current speed)

ETA next p. (avg.sp)

estimated time to next point (average speed)

Time to next p. (curr.sp)

time to next point (current speed)

Time to next p. (avg.sp) time to next point (average speed)
Total pause time cumulated pause times
Current pace Pace: min/km or min/mile
Average pace
Maximum pace
Last lap avg. pace
Current lap avg. pace
Average pace (elapsed)

Elapsed distance
Distance to destination
Distance to next point
Current lap distance
Odometer

Current speed
Average speed
Maximum speed
Last lap avg. speed
Current lap avg. speed
Average speed (elapsed)

Current cadence
Average cadence
Maximum cadence

Current bike power
Average bike power
Maximum bike power
% FTP
Normalized bike power w/ zeros NP including zero-Watt values
Normalized bike power NP without zero-Watt values
Last lap NP w/ zeros
Last lap NP
Last lap average power
Current Lap NP w/ zeros
Current Lap NP
Current Lap average power
Current Lap average power w/ zeros
Power zone number
Time in powerzone 0-6
% in powerzone 0-6

Current altitude
Total ascent
Total descent

Gradient % for a stable display of Gradient set "number of values" to 10 - 20

Current heartrate
Maximum heartrate
Heartrate zone number

Last lap average HR
Current lap average HR
Time in HR zone 0-5
% in HR zone 0-5

Calories spent
Lap number
Pressure
Battery value

Pascals (Pa)

GPS accuracy 0-4 (no signal -> very good signal)
GPS high acc indicator

This value is set to 1 the first time the current speed is under 5 km/h. Because GPS still jumps around at the beginning although it indicates max accuracy this indicator was added.

When accuracy is still low, a high current speed is displayed even if standing still. So this indicator gets a value of 1 the first time the speed is under 5 km/h, that generally indicates that GPS got a better fix on that position (see example_FR935_3.xml).

Checks also for gps accuracy > 3 not only the current speed.

Training effect (aerobe only)

Bike current gear for 1-chainring systems only (modern MTB)
Text: wheel circumference; chain ring; sprockets small to big;
example SRAM Eagle X1 (29"):
220;30;10;12;14;16;18;21;24;28;32;36;42;50

Temperature updated every 5 minutes, for all devices which support temperature. An offset can be set (+/-) in settings, if your device is constantly deviating from the correct temperature.

Free memory is to show a roughly estimate how much memory is free during testing of your layout. There should be at least 200 bytes free after starting the timer. Be aware that using the pacer will use about 800 bytes more after starting the timer!

Pacer calc average speed This field is mandatory when using pacer because all pacer calculations are based on this field. It just needs to be in the layout, it can be hidden in the background. The "nr of values" must be set to a value multiple of 30. This value defines in which timer range the current average speed is calculated and the ahead/behind time and predicted time are base on the already reached distance and this average speed. In the example file it is set to 300 (5mins): FR935/example_FR935_pacer.xml

Pacer curr. ahead time Shows the ahead/behind time.

This values represents how much second you are behind your goal pace at the moment.

Pacer target ahead time Shows your ahead/behind time. The difference to the above value (pacer curr ahead time) is that it predicts the time you are ahead/behind when you reach the goal based on your current average speed. This value needs the pacer target distance to be set. The values bases its prediction on the "Pacer calc average speed" value which is your current average speed over the last XX seconds (it should be at least 5 minutes (300s), so the value doesn't jump too quickly when the speed changes).

Pacer predicted time Shows the finish time based on already elapsed distance and average speed over last XX seconds/minutes.

Correlates to the Pacer target ahead time.

Pacer predicted pace Calculated finish pace based on above values

Pacer total average pace Current total average based including corrected distance (see below)

Pacer corrected distance Shows the current elapsed distance including the offset value (lap button press, see below)

Pacer offset indicator This graphic element (in example-layout a little yellow circle) is only shown when a distance offset value is set by lap button press (see below)

Settings for Pacer:

Pacer distance: distance in km: -> '21.1' (for a half marathon)

It is possible to enter more than one pacer distance separated by ';'.
Multiple pacer distances only make sense when using target

pace 'PX:YY'!

Pacer target time/pace: the target time or target pace:

target time -> 'T2:05:05' (for 2h 05mins 05sec target time)

or target pace -> 'P5:30' (for a target pace of 5:30 min/km)

Distance correction:

It is possible to press the lap button at a km marker during a race. The distance is then rounded to the nearest kilometer and "Pacer total average pace" and "Pacer corrected distance" are corrected. (5.1 km corrects to 5.0 km; 3.84 km corrects to 4.0 km).

When correction is active it is indicated by the "Pacer offset indicator" (little yellow circle in example-layout).

When lap button is pressed within 30 seconds again, the offset is reset.

An example layout can be found in the examples.zip ->

FR935/example_FR935_pacer.xml

Ahead time and predicted pace are written into the fit file (optional).

3d) TIME FORMATS

For all time data you can use different display formats:

\$H:\$M:\$S is the standard-format 00:00:00 (shows hours only if > 0)

\$H:\$M:\$C display format 00:00 (shows hours only if value > 0,
shows seconds only if hours < 1)

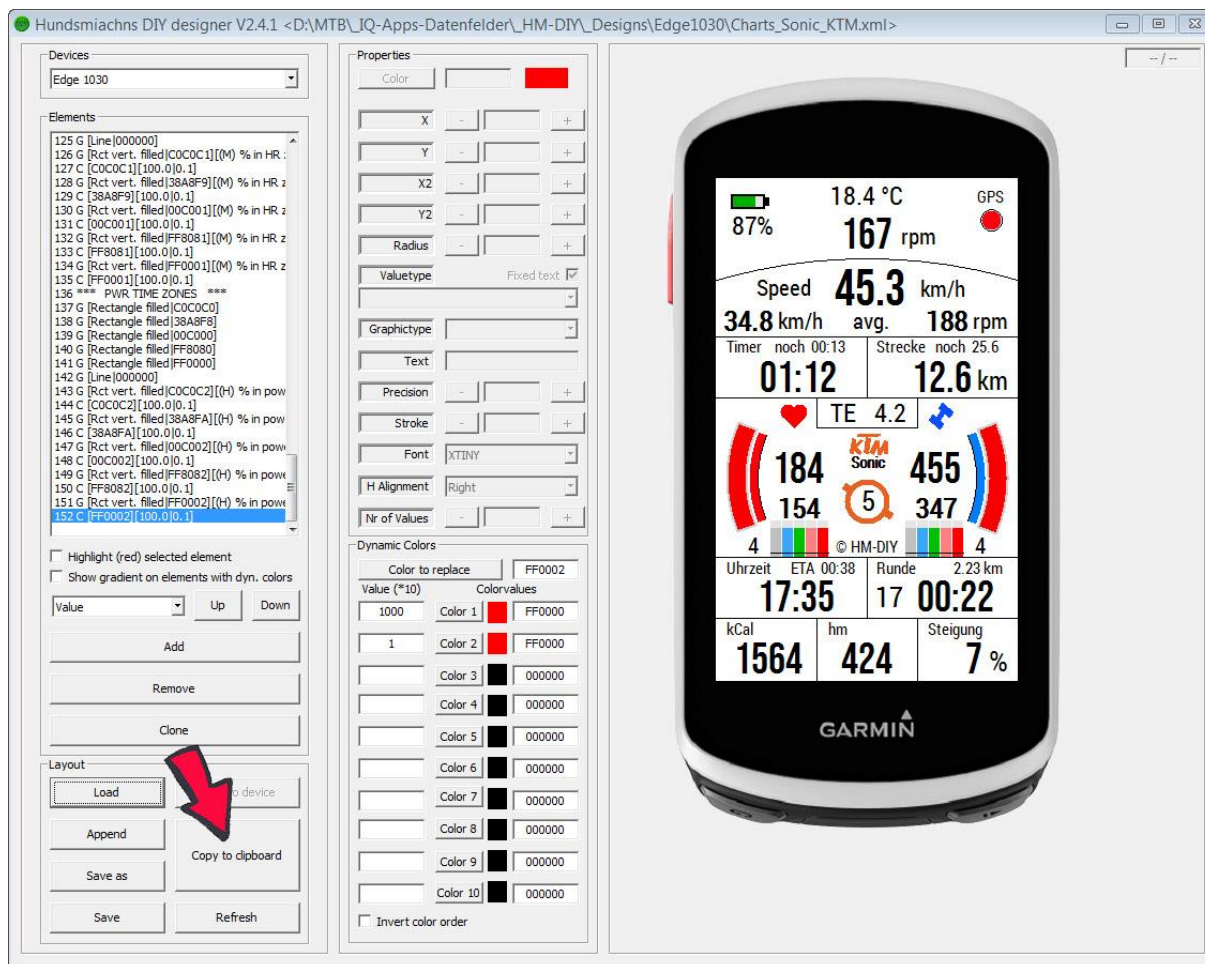
\$h:\$M:\$S displays only one hour-digit if the number is in single digits

\$m:\$S displays only one minute-digit if the number is in single digits

4) TRANSFERRING YOUR LAYOUT TO YOUR GARMIN DEVICE

Once you are satisfied with the layout of your design in the Designer tool preview, the design needs to be transferred to your device.

On the Designer tool click the button "Copy to Clipboard".



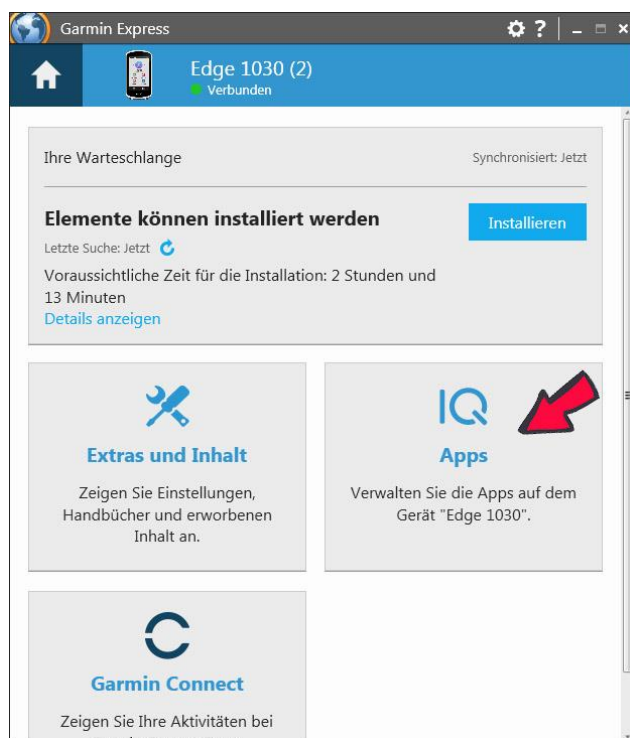
This copies a layout-string to the clipboard which is to be pasted into the setup-routine on your device.

Transferring the layout to your Garmin device can be done in 2 ways:
using Garmin Express or using Garmin Connect Mobile.

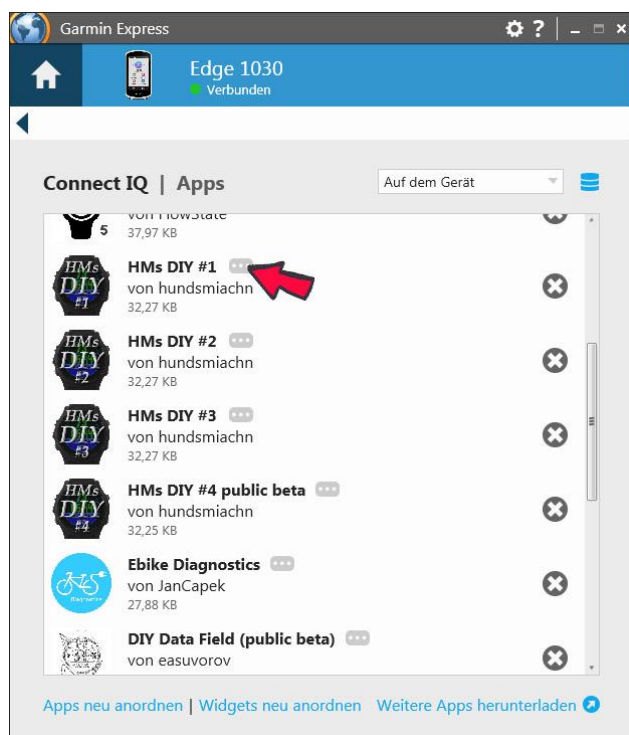
- Transfer with Garmin Express:

Connect your device to your PC, start Garmin Express, tap on the device icon.

A window opens - tap on IQ Apps:



Another window opens and shows all installed IQ-Apps and Datafields:
Tap the 3-dots-button of HMs DIY #



The Setup-window opens:

Garmin Express

HM's DIY #1 Einstellungen

Default layout string

!!iQ!lww*!yYK+(yN!!iQ)zQOi)zQP9m

Running layout string

Biking layout string

Pacer distances [km or mi] (X;Y;...)

10.0;21.1;42.2

Pacer target time/pace ('TH:MM:SS' or 'PM:SS')

T1:00:00

Temperature offset [C or F]

0.0

Total distance (Odometer) [m]

0

Store pacer ahead times to fit file

☒ Aus

FTP (Functional Threshold Power)

0.0

Power Zones [z0;z1;...;z6]

52;80;105;140;170;195;215

Cap pace at [s]

599

Speichern Abbrechen

(for Pacer-options see page 19)

Now paste the layout-string into the field "Default layout string".

For multifunctional watches you can define 2-more layout strings.

Type in all other data of your interest:

Save your settings and disconnect your device safely from your PC.

Let your device boot.

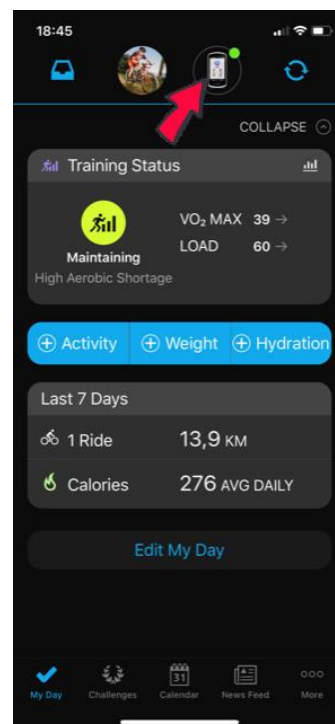
Now you have to choose a datafield big enough on your device to load the DIY-datafield.

Enjoy!

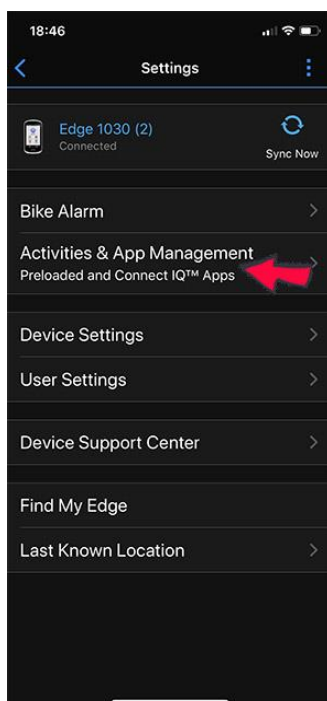
- Transfer with Garmin Connect Mobile:

On your mobile-phone start Garmin Connect Mobile, turn on your Garmin device and wait until the connection was established.

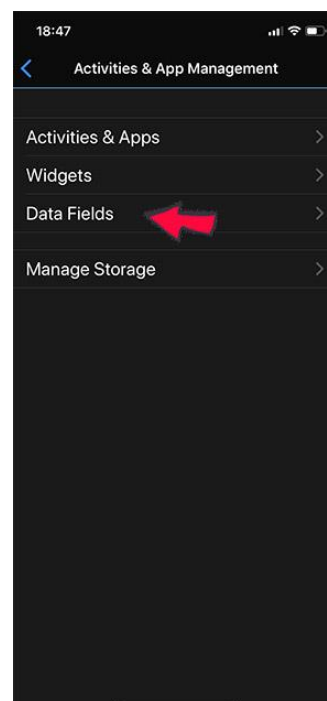
On your mobile phone tap on the device icon with the green dot.



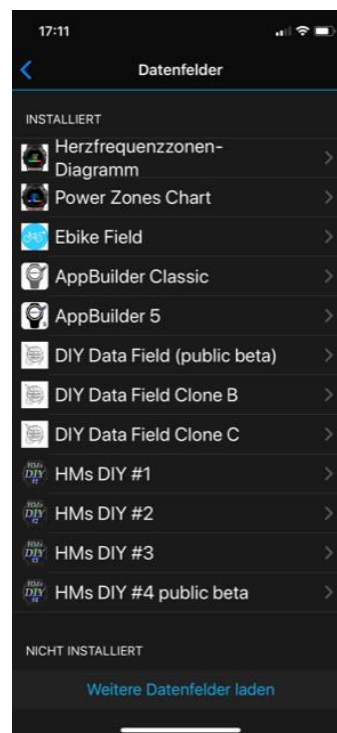
Tap on "Activities & App Management"



Tap on "Data Fields"



Tap on the desired DIY-Datafield
and on the next screen tap on "Setup".



Now an input page opens, which corresponds to the one shown above (transfer via Garmin Express).

Paste the layout-string into the field "Default layout string".

For multifunctional watches you can define 2-more layout strings.

Type in all other data of your interest and save your settings.

Now you have to choose a datafield big enough on your device to load the DIY-datafield.

Enjoy!

5) FONTMAPPING FOR YOUR DEVICE

As described in chapter 3) DESIGNER TOOL Garmin does not publish the fonts that are used on their devices. They are not available as truetype fonts (ttf). So similar fonts had to be found in order to display text and digits reasonably satisfactorily. This is the reason why there is a certain discrepancy between the preview in the designer and the actual appearance on the device.

In the Designer tool there are 9 replacement fonts built in, which can be adjusted as best as possible.

Available font IDs in the application DIY-Designertool:

```
# IDR_FNT_ROBOTO_COND_BOLD
# IDR_FNT_ROBOTO_COND_REG
# IDR_FNT_BEBASNEUE_REG
# IDR_FNT_DEJAVUSANS
# IDR_FNT_DEJAVUSANS_BOLD
# IDR_FNT_DEJAVUSANS_COND
# IDR_FNT_DEJAVUSANS_COND_BOLD
# IDR_FNT_STEELFISH_REG
# IDR_FNT_STEELFISH_BOLD
```

The built-in fonts look like this:

ROBOTO Condensed Bold

ABCDEFGHIJKLMNO
PQRSTUVWXYZÀÁÊË
ÏÐabcdefghijklmnp
qrstuvwxyzàáêëïðü&
1234567890(\$£€.,!?)

ROBOTO Condensed Regular

ABCDEFGHIJKLMN
OPQRSTUVWXYZÀÁ
abcdefghijklmnpqr
stuvwxyzàáêëïðü&1
234567890(\$£€.,!?)

BEBASNEUE Reg

ABCDEFGHIJKLMNOPQR
ABCDEFGHIJKLMNOPQR
1234567890 !@#\$%&'

DEJAVUSANS

ABCDEFGHIJKLM
NOPQRSTUVWXYZ
abcdefghijklm
nopqrstuvwxyz
0123456789
!@#\$%^&*()

DEJAVUSANS BOLD

ABCDEFGHIJKLM
NOPQRSTUVWXYZ
ZÀÁÊËÏÖøabcdefghijklmnop
hijklmnopqrstuv
wxyzàáéíöø&123
4567890(\$£€.,!?)

DEJAVUSANS CONDENSED BOLD

ABCDEFGHIJKLMNO
PQRSTUVWXYZÀÁÊ
abcdefghijklmnopq
rstuvwxyzàáéíöø&1
234567890(\$£€.,!?)

STEELFISH REG

ABCDEFGHIJKLMNOPQRST
UVWXYZÀÁÊËÏÖøabcdefgh
ijklmnopqrstuvwxyzàáéíö
øü&1234567890(\$£€.,!?)

STEELFISH BOLD

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxy
1234567890 (!@#\$%?&[*^=+/-...])

This mapping is stored in the fonts.txt file. There is a list of fonts for every Garmin device and there are several entries for every device for the different font types that are available on that device.

For many devices, the adaption was done already.

If you find, the layout showed in the designertool for your device is not satisfactory - you have to adapt the fonts.

How to adapt the fonts for your device:

There are many devices for which the font adjustment has already been made and is already stored in the downloaded file fonts.txt.

These are among others:

all Edge devices, D2-watches, Descent Mk1, most Fenix, most Forerunner (especially FR 935), Marq, some Vivoactive.

If you're not sure for your device, do the following:

From the downloaded examples-collection load from the folder FR935 the layoutfile font_test1.xml and/or font_test2.xml:

These look like this:



Now change the entry for "device" on the Designer to your device and press the "Scale to device" button.

If it looks like the left picture below, then the font mapping for your device has not yet been done. If it looks like the right picture, it has already been done (roughly).



In either case, save the fonttest layout under a new name for your device.
Then transfer the layout to your device and check what it looks like.

Now the appearance must be adjusted in the Designer to match the appearance on the device. Probably you have to adapt fontsizes and alignments - maybe also fontfaces.

Now search the file fonts.txt for your device name to find all the fonts available in your device.

We will do this as an example for EDGE 1030. But it is the same procedure for all devices.

Search for "edge 1030".

You will find:

//DONE (means: the fonts were adapted already).

"Edge 1030" - "XTINY" ==> FNT_ROBOTO_CONDENSED_16

"Edge 1030" - "TINY" ==> FNT_ROBOTO_CONDENSED_22

"Edge 1030" - "SMALL" ==> FNT_ROBOTO_CONDENSED_26

"Edge 1030" - "MEDIUM" ==> FNT_ROBOTO_CONDENSED_29

"Edge 1030" - "LARGE" ==> FNT_ROBOTO_CONDENSED_48

"Edge 1030" - "NR_MILD" ==> FNT_DEJAVU_FITNESS_30

"Edge 1030" - "NR_MEDIUM" ==> FNT_DEJAVU_FITNESS_35

"Edge 1030" - "NR_HOT" ==> FNT_DEJAVU_FITNESS_47

"Edge 1030" - "NR_THAI_HOT" ==> FNT_DEJAVU_FITNESS_58

There you can see:

the font NR_MILD for example is mapped to FNT_DEJAVU_FITNESS_30.

Now search for FNT_DEJAVU_FITNESS_30:

You will find:

FNT_DEJAVU_FITNESS_30;IDR_FNT_BEBASNEUE_REG; 40; -7; 0; 8; -6

(All different values in this line are separated by a semicolon.)

That means:

The font **NR_MILD** of your device will be replaced by **BEBASNEUE_REG** in the designertool.

The numbers at the end of the line represent:

40 ... fontsize

-7 ... horizontal offset in pixel when used left-alignment (+ to the right, - to the left)

0 ... horizontal offset in pixel when used center-alignment

8 ... horizontal offset in pixel when used right-alignment

-6 ... vertical offset (+down, - up)

For every font (every value-figure in your design) first try to adapt the fontsize.
If the font in the preview seems to be too small, increase the fontsize or vice-versa.
If you like to change the fontface - for example the font BEBASNEUE_REG to font DEJAVUSANS CONDENSED BOLD, change the line:

```
FNT_DEJAVU_FITNESS_30;IDR_FNT_BEBASNEUE_REG; 40; -7; 0; 8; -6
```

to the new line

```
FNT_DEJAVU_FITNESS_30;IDR_FNT_DEJAVUSANS_COND_BOLD; 40; -7; 0; 8; -6
```

Save the file fonts.txt, close the Designer and start the Designer anew. Now the fontsizes and -faces should have been changed.

After you have adapted the fonts you have to adapt the place (alignments) of the figures.

The origin of text and numbers is approximately:

- left/upper corner for left-alignment
- right/upper corner for right-alignment
- center/upper point for center-alignment



However, this is not as accurate for the fonts in the Garmin devices as shown here.
Therefore, adjustments using the offset values are usually necessary both horizontally and vertically.

In the font.txt file edit the horizontal and vertical offsets to match the appearance on the device. Estimate by how many pixels the figure has to be moved left/right/up/down to match the appearance on the device.

Change the values for alignments, save the fonts.txt file, close the designer, start it anew and check if the (false) position in the Designer matches the (false) position on the device.

DO NOT change the coordinates of the elements in the designer until the preview in the designer matches your device!

If you have made sure that the appearance in the designer matches the appearance on the device, and you have only achieved this by editing the offsets in the file fonts.txt, now place the elements in the designer in the correct position.

Save the design.

Transfer it to your device and check if it looks better now.

You have to continue these steps until the appearance on the device is as similar as possible to the appearance of the designertool.

Note: graphic elements like lines, circles, rectangles and so on always are on the right position. There can be no offset error for these.

A practical example of offset adjustment:

You created a layout that looks good in the Designer preview, but after transfer to the device there are some differences:



Let's concentrate on the middle number: clock-time. It has fontsize NR_THAI_HOT.

On the watch, that figure is too low. It must be raised.

That means: the transferred y-coordinate is too large.

Estimate by how many pixels the time-value must be raised, so that it sits correctly on the watch. Let's say: 10 pixel up.

Open the file "fonts.txt" and search for the mapped font of NR_THAI_HOT of your device. For example:

```
FNT_VIVOACTIVE4_BOLD_NUMBER_FONT_6;IDR_FNT_BEBASNEUE_REG; 70; 0; 0; 0; 0
```

Add +10 pixel to the last number of that line for vertical offset.

```
FNT_VIVOACTIVE4_BOLD_NUMBER_FONT_6;IDR_FNT_BEBASNEUE_REG; 70; 0; 0; 0; 10
```

Save the fonts.txt file and end the Designer tool.

Start the Designer anew. Now the time value is (hopefully) at the same (false) position like on the watch.

On the Designer raise the y-coordinate to bring the time-value on its right place.

Transfer the layout to your watch and check again.

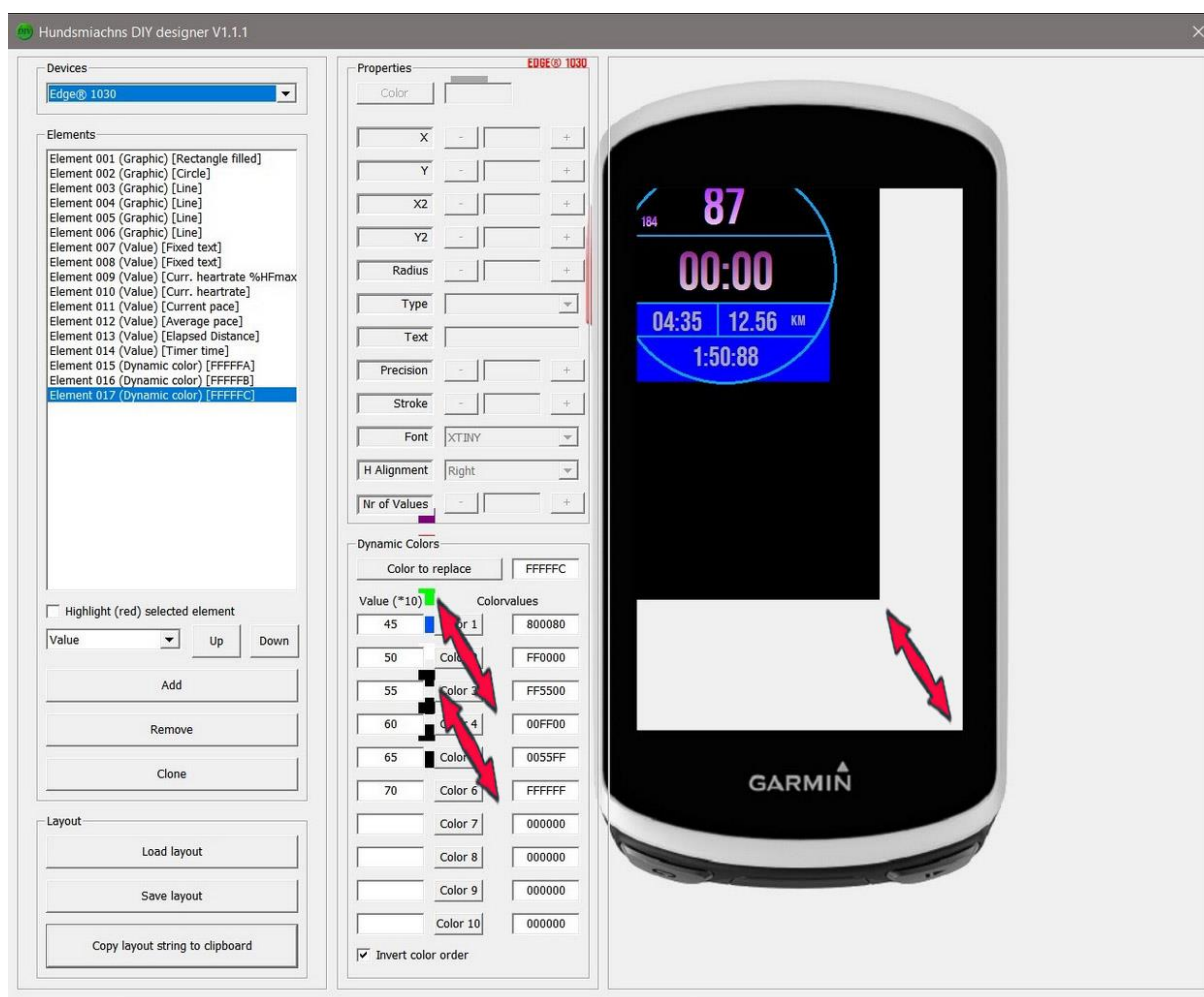


6) TROUBLESHOOTING

Layout issues:

If you are seeing some layout issues with the Designer tool on your PC, probably it is a problem with the font size of your PC-screen settings.

PC font size has to be 100 % for the Designer tool.



Please change the properties of the Designer-exe file so that it overrides the High DPI scaling settings with 'System (Enhanced)'.

Right click the exe, click properties, click Change High DPI settings (or on WIN7: Compatibility), check High DPI scaling override, and choose SYSTEM from the drop down. Back out saving.

The Designer tool window will display correctly when opened.

(Work is in progress for a solution.)

PC screen is not high enough:

The screen of some PCs or laptops may not be high enough to display the entire Designer window (900 pixels height). The lower area is not visible.

There are keyboard shortcuts for this:

- "Load" -> Ctrl+O
- "Save" -> Ctrl+S
- "Append" -> Ctrl+P
- "Save as" -> Ctrl+Shift+S
- "Copy to clipboard" -> Ctrl+B
- "Copy element" -> Ctrl+C
- "Paste element" -> Ctrl+V
- "Cut element" -> Ctrl+X

Designer tool freezes:

This can happen in rare cases due to a graphic overflow.

But don't worry!

Nothing of your work will be lost. Just quit the designer and restart it.

You'll be back at the exact same position as before.

(Work is in progress for a solution.)

7) APPENDIX

The complete documentation of the release notes can be viewed here: [Releasenotes](#)

Device Memory

For the most of the valuetypes there is a specification in front of the name:

nothing: available for all devices.

(M): additionally available on devices with "medium memory".

(H): additionally available on devices with "high memory"

Current max elements: low memory devices: 22

medium memory devices: 43

high memory devices: 500

(Low memory devices are those with only 16 kb memory, for example FR235, FR630, D2 Bravo...)

Garmin Device Properties

ID	Shape	WxH	Touch	Tone	Vibrate	DF Mem	Cadence	Speed	HR	Power	Shift	Color Depth
approachs60	round	240x240	+	--	+	29328	+	+	+	--	--	8
d2bravo	round	218x218	--	+	+	16384	+	+	+	+	--	4
d2bravo_titanium	round	218x218	--	+	+	16384	+	+	+	+	--	4
d2charlie	round	240x240	--	+	+	127632	+	+	+	+	+	8
d2delta	round	240x240	--	+	+	127632	+	+	+	+	+	8
d2deltapx	round	240x240	--	+	+	127632	+	+	+	+	+	8
d2deltas	round	240x240	--	+	+	127632	+	+	+	+	+	8
descentmk1	round	240x240	--	+	+	127632	+	+	+	+	+	8
edge1030	rectangle	282x470	+	+	--	127632	+	+	+	+	+	16
edge1030bontrager	rectangle	282x470	+	+	--	127632	+	+	+	+	+	16
edge130	rectangle	230x303	--	+	--	29328	+	+	+	+	--	1
edge520plus	rectangle	200x265	--	+	--	127632	+	+	+	+	+	16
edge530	rectangle	246x322	--	+	--	127632	+	+	+	+	+	16
edge820	rectangle	200x265	+	+	--	127632	+	+	+	+	+	16
edge830	rectangle	246x322	+	+	--	127632	+	+	+	+	+	16
edgeexplore	rectangle	240x400	+	+	--	127632	+	+	+	--	--	16
edge_1000	rectangle	240x400	+	+	--	127632	+	+	+	+	+	16
edge_520	rectangle	200x265	--	+	--	29328	+	+	+	+	+	16
epix	rectangle	205x148	+	+	+	131072	+	+	+	+	--	8
fenix3	round	218x218	--	+	+	16384	+	+	+	+	--	4
fenix3_hr	round	218x218	--	+	+	16384	+	+	+	+	--	4
fenix5	round	240x240	--	+	+	29328	+	+	+	+	+	8
fenix5plus	round	240x240	--	+	+	127632	+	+	+	+	+	8
fenix5s	round	218x218	--	+	+	29328	+	+	+	+	+	8
fenix5splus	round	240x240	--	+	+	127632	+	+	+	+	+	8
fenix5x	round	240x240	--	+	+	127632	+	+	+	+	+	8
fenix5xplus	round	240x240	--	+	+	127632	+	+	+	+	+	8
fenix6	round	260x260	--	+	+	29328	+	+	+	+	+	8
fenix6pro	round	260x260	--	+	+	127632	+	+	+	+	+	8
fenix6s	round	240x240	--	+	+	29328	+	+	+	+	+	8
fenix6spro	round	240x240	--	+	+	127632	+	+	+	+	+	8
fenix6xpro	round	280x280	--	+	+	127632	+	+	+	+	+	8
fenixchronos	round	218x218	--	+	+	29328	+	+	+	+	+	8

fr230	semiround	215x180	--	+	+	16384	+	+	+	--	--	4
fr235	semiround	215x180	--	+	+	16384	+	+	+	--	--	4
fr245	round	240x240	--	+	+	29328	+	+	+	--	--	8
fr245m	round	240x240	--	+	+	62096	+	+	+	--	--	8
fr45	round	208x208										4
fr630	semiround	215x180	+	+	+	16384	+	+	+	--	--	4
fr645	round	240x240	--	+	+	29328	+	+	+	--	--	8
fr645m	round	240x240	--	+	+	62096	+	+	+	--	--	8
fr735xt	semiround	215x180	--	+	+	29328	+	+	+	+	+	4
fr920xt	rectangle	205x148	--	+	+	16384	+	+	+	+	--	4
fr935	round	240x240	--	+	+	29328	+	+	+	+	+	8
fr945	round	240x240	--	+	+	127632	+	+	+	+	+	8
garminswim2	round	208x208										4
gpsmap66	rectangle	240x400	--	+	--	127632	+	+	+	--	--	16
gpsmap86	rectangle	240x400	--	+	--	127632	+	+	+	--	--	16
legacyherocaptainmarvel	round	218x218	+	--	+	29328	+	+	+	--	--	8
legacyherofirstavenger	round	260x260	+	--	+	29328	+	+	+	--	--	8
legacysagadarthvader	round	260x260	+	--	+	29328	+	+	+	--	--	8
legacysagarey	round	218x218	+	--	+	29328	+	+	+	--	--	8
marqadventurer	round	240x240	--	+	+	127632	+	+	+	+	+	8
marqathlete	round	240x240	--	+	+	127632	+	+	+	+	+	8
marqaviator	round	240x240	--	+	+	127632	+	+	+	+	+	8
marqcaptain	round	240x240	--	+	+	127632	+	+	+	+	+	8
marqcommander	round	240x240	--	+	+	127632	+	+	+	+	+	8
marqdriver	round	240x240	--	+	+	127632	+	+	+	+	+	8
marqexpedition	round	240x240	--	+	+	127632	+	+	+	+	+	8
oregon7xx	rectangle	240x400	+	+	--	127632	+	+	+	--	--	16
rino7xx	rectangle	240x400	+	+	--	127632	+	+	+	--	--	16
venu	round	390x390	+	--	+	29328	+	+	+	--	--	16
vivoactive	rectangle	205x148	+	--	+	16384	+	+	+	--	--	8
vivoactive3	round	240x240	+	--	+	29328	+	+	+	--	--	8
vivoactive3d	round	240x240	+	--	+	29328	+	+	+	--	--	8
vivoactive3m	round	240x240	+	--	+	29328	+	+	+	--	--	8
vivoactive3mlte	round	240x240	+	--	+	29328	+	+	+	--	--	8
vivoactive4	round	260x260	+	--	+	29328	+	+	+	--	--	8
vivoactive4s	round	218x218	+	--	+	29328	+	+	+	--	--	8
vivoactive_hr	rectangle	148x205	+	--	+	29328	+	+	+	--	--	8
vivolife	round	240x240										8

Thanks to **DaveBrillhart** for creating this list of all the Garmin devices!