



How to modify LCD panel design

1 Abstract

With a new firmware feature (starting since firmware revision 2.2.3b71 RC2), there is a possibility to replace file(s) in a target device. Formerly, there was only a possibility to replace full directories. This feature is used to modify web design, e.g. for LCD panel (TV).

Advantage of this feature is you can apply your custom web design modification over any firmware release, so you can have up to date firmware with your customized web design.

2 How to Create a Web Image

To ease a web image creation , we prepared a batch file for this.

Required steps:

1. Unzip the lcd_panel-engine.zip into a directory.
2. Unzip lcd_panel-standard.zip into the same directory.
3. Modify the lcd design:
 - 3.1. E.g. replace background image in img subdirectory, keep the file name same.
 - 3.2. Optionally modify screen layout in pages/lcd.xsl,
 - 3.3. style for screen items in css/lcd.css/lcd
 - 3.4. and way how page is refreshed in lcd/lcd.js.
4. Run prep.cmd.
5. Upload resulting custom_web.img in a same way as a standard firmware – use the Solar Monitor SMx-MU unit web page (menu item Settings / Backup, CSV, FW).

3 More Detailed

3.1 How LCD design is linked to the Solar Monitor SMx-MU web?

When a user selects the Overview / LCD Panel menu item on a Solar Monitor web, lcd.xml file is produced. This files contains current values and an instruction to use lcd.xsl file for rendering the data. The rest is completely in your hands. Standard way is to use classes in the xsl file, use css/lcd.css to format these classes and a full HD background image in img\bg_lcd_h.jpg. Some customizations are using different graphic formats, e.g. png. The xsl file determines this. If you want to have a dynamic presentation, you need to involve a Javascript code. In the following description, it is located in js/lcd.js and is invoked from the lcd.xsl file.

3.2 Requirements

You need to have a zip archiver, with which you can store files into an archive with no (zero) compression and a [gzip](#) packer for file compression (suitable for web browser). E.g. you can use Total Commander (<https://www.ghisler.com/>) and any gzip utility – see the [Wikipedia gzip](#) page or use the utils/gzip.exe for

Windows. Instead of Total Commander, you can also use the utils/zip.exe utility.

Only certain files need to be gzipped (you can check the make_web_img.bat). **Additional ones MUST NOT be gzipped**, because their gzip state is not supported in a firmware.

The css and js files can be minimized with AjaxMinifier - see the utils directory.

The utils/fnr.exe utility can be used to replace {{VERSION}} strings in web files.

You are expected to have your graphic design ready - graphics in jpg, png, style(s) in css, javascript(s) in js, rendering(s) in pages/*.xsl.

3.3 Files Description

/fw_sm2.nfo	- control file (the prep.cmd automatically generates it)
/webfiles/lcd.xsl	- stylesheet for rendering lcd.xml (data file, produced by Solar Monitor unit). You can think about it like an html, where data are inserted from xml and css is applied to generated classes.
/webfiles/css	- directory with cascading style sheets
/webfiles/css/lcd.css	- style sheet, used in rendering with lcd.xsl
/webfiles/img	- directory for images
/webfiles/img/bg_lcd_h.jpg	- LCD background image (for <head>)
/webfiles/img/bg_lcd_b.jpg	- LCD background image, typically logo (for <body>)
/webfiles/js	- directory for Java Script files
/webfiles/js/lcd.js	- JS file, used to repeatedly refresh (update) data on a screen

3.2.1 Example of fw_sm2.nfo file

The bootloader version (bl_version), product ID (product_id) and product version (product_ver) must be specified as below, the update mode (update_mode) is 1 for a single replace file mode, 0 for a directory replace mode (you need to place all web design files from webfiles directory). The info section is open for your notes. Checksum is not required.

```
;requirements
bl_version=2
product_id=1
product_ver=0
update_mode=1
checksum=87F2
;info
creation_date=Thu
creation_time=12:42:01
created_by=your_name
firmware_version=2.2.3b71
release_candidate=RC2
```

10/22/2020

3.4 Manual Way for Web Image Creation

This is useful in case you have a web image file and you want to replace a single graphic file, not supported in a firmware. i.e. its gzip is not required.

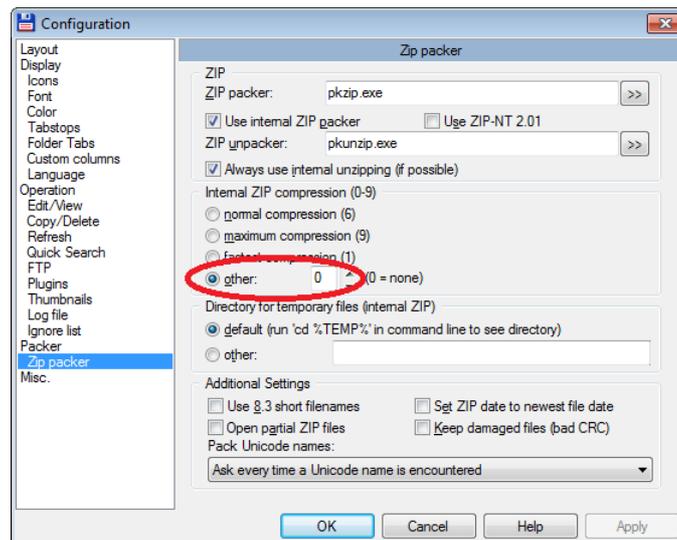
3.2.2 Preconditions

You need to have a zip archiver, with which you can store files into an archive with no (zero) compression. E.g. you can use Total Commander (<https://www.ghisler.com/>). You are expected to have your graphic design ready - graphics in jpg, png, styles in css, javascript in js, rendering in xsl.

3.2.3 Required steps

All files are compressed first, resulted archive renamed to the originated file name and then stored into a final archive with no compression.

- 1) Create a temporary directory and create a webfiles subdirectory in it.
- 2) Create the fw_sm2.nfo control file (or modify a previously obtained one).
- 3) Prepare your design files and pack supported files into an archive with gzip. A web browser will later unpack these files on a client machine.
- 4) Rename gzipped archives into their original file names.
- 5) Reconfigure your zip packer to use no compression (zero). See the example of setup for Total Commander below.



- 6) Pack all files together into a single archive and use .img for its extension.
- 7) Do not forget to reconfigure your zip packer back to your favorite compression level.
- 8) Upload the image file with the Solar Monitor web page (menu item Settings / Backup, CSV, FW).

Note: You can browse the .img archive with Total Commander after pressing Ctrl – PgDn.

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10th December 2020