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# **LittlevGL Documentation**

*Release 6.1.2*

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English (en) - 中文 (zh-CN) - Français (fr) - Magyar (hu) - Türk (tr)

Version PDF: LittlevGL.pdf



LittlevGL est une bibliothèque graphique gratuite et à code source ouvert offrant tout ce dont vous avez besoin pour créer une interface graphique embarquée avec des éléments graphiques faciles à utiliser, de superbes effets visuels et une faible empreinte mémoire.

[Site Internet](#) • [GitHub](#) • [Forum](#) • [Démonstration en ligne](#) • [Simulateur](#) • [Blog](#)

## **POINTS FORTS**

- Éléments de base évolués tels que boutons, graphiques, listes, curseurs, images, etc.
- Graphiques avancés avec animations, anti-crénelage, opacité, défilement doux
- Périphériques d'entrée variés tels que pavé tactile, souris, clavier, encodeur, etc.
- Prise en charge multilingue avec encodage UTF-8
- Prise en charge de plusieurs écrans, c-à-d utilisation simultanée d'un écran TFT et d'un écran monochrome
- Éléments graphiques entièrement personnalisables
- Indépendant du matériel : utilisable avec n'importe quel microcontrôleur ou écran
- Adaptable pour fonctionner avec peu de mémoire (64 ko de mémoire Flash, 16 ko de MEV)
- SE, mémoire externe et GPU pris en charge mais non requis
- Fonctionne avec un seul tampon d'affichage même avec des effets graphiques avancés
- Écrit en C pour une compatibilité maximale (compatible C++)
- Simulateur pour débiter sur PC la conception d'interface graphique embarquée sans le matériel embarqué
- Tutoriels, exemples, thèmes pour une conception rapide
- Documentation disponible en ligne et hors ligne
- Gratuit et à code source ouvert, sous licence MIT

## ELÉMENTS REQUIS

- Microcontrôleur ou processeur 16, 32 ou 64 bits
- Une vitesse d' horloge supérieure à 16 MHz est recommandée
- Flash/MEM : une taille supérieure à 64 ko pour les composants essentiels (une taille supérieure à 180 ko est recommandée)
- MEV :
  - Utilisation de MEV statique : approximativement 8 à 16 ko en fonction des types d' objets et des fonctionnalités utilisés
  - Pile : taille supérieure à 2 ko (une taille supérieure à 4 ko est recommandée)
  - Données dynamiques (tas) : taille supérieure à 4 ko (une taille supérieure à 16 ko est recommandée si plusieurs objets sont utilisés). Défini par `LV_MEM_SIZE` dans `lv_conf.h`.
  - Tampon d' affichage : taille supérieure à “résolution horizontale” pixels (une taille supérieure à  $10 \times$  “résolution horizontale” est recommandée)
- Compilateur conforme à C99 ou plus récent
- Connaissances de bases en C (ou C++) : [pointeurs](#), [structures](#), [fonctions de rappel](#).

*Notez que l' utilisation de la mémoire peut varier en fonction de l' architecture, du compilateur et des options de compilation.*

### 3.1 Où commencer ?

- Pour un aperçu général de LittlevGL, visitez [littlevgl.com](http://littlevgl.com)
- Accédez à la section *Démarrer* pour essayer des démonstrations en ligne dans votre navigateur, en savoir plus sur le simulateur et les bases de LittlevGL.
- Vous trouverez un guide de portage détaillé dans la section *Portage*.
- Pour savoir comment LittlevGL fonctionne, accédez à *Vue d' ensemble*.
- Pour lire des tutoriels ou partager vos propres expériences, accédez au *Blog*
- Pour découvrir le code source de la bibliothèque, consultez-le sur GitHub : <https://github.com/littlevgl/lvgl/>.

### 3.2 Où puis-je poser des questions ?

Pour poser des questions sur le forum : <https://forum.littlevgl.com/>.

Nous utilisons le suivi des problèmes de [GitHub](#) pour les discussions relatives au développement. Vous ne devez donc l' utiliser que si votre question ou votre problème est étroitement lié au développement de la bibliothèque.

### 3.3 Est-ce que mon microcontrôleur/matériel est supporté ?

Chaque microcontrôleur capable de piloter un affichage via un port parallèle, SPI, une interface RVB ou autre, et conforme aux *éléments requis*, est pris en charge par LittlevGL.

Cela comprend :

- Les microcontrôleurs “courants” tels que les STM32F, STM32H, NXP Kinetis, LPC, iMX, dsPIC33, PIC32, etc.
- Les modules Bluetooth, GSM, WiFi tels que les Nordic NRF et Espressif ESP32
- Le tampon de trame de Linux comme `/dev/fb0` ce qui inclut également les ordinateurs monocartes comme le Raspberry Pi
- Et tout ce qui possède un microcontrôleur suffisamment puissant et le nécessaire pour piloter un écran

## 3.4 Mon écran est-il supporté?

LittlevGL nécessite uniquement un simple pilote pour copier un tableau de pixels dans une zone donnée de l' affichage. Si vous pouvez le faire avec votre écran, vous pouvez utiliser cet écran avec LittlevGL.

Cela comprend :

- Les TFT avec une profondeur de couleur de 16 ou 24 bits
- Les moniteurs avec port HDMI
- Les petits écrans monochromes
- Les écrans à affichages en niveaux de gris
- Les matrices LED
- Ou tout autre affichage où vous pouvez contrôler la couleur/l' état des pixels

Consultez la section *Portage* pour en savoir plus.

## 3.5 LittlevGL est-il libre ? Comment puis-je l' utiliser dans un produit commercial ?

LittlevGL est fourni sous [licence MIT](#), ce qui signifie que vous pouvez le télécharger et l' utiliser à vos fins sans obligation.

## 3.6 Rien ne se passe, mon pilote d' affichage n' est pas appelé. Qu' est-ce que j' ai raté ?

Assurez-vous que vous appelez `lv_tick_inc(x)` dans une interruption et `lv_task_handler ()` dans votre boucle principale `while (1)`.

Apprenez-en plus dans les sections *Tic* et *Gestionnaire de tâche*.

## 3.7 Pourquoi le pilote d' affichage n' est appelé qu' une seule fois ? Seule la partie supérieure de l' écran est actualisée.

Assurez-vous que vous appelez `lv_disp_flush_ready(drv)` à la fin de votre *fonction de rappel du pilote d' affichage*.

## 3.8 Pourquoi je ne vois que des parasites à l' écran?

Il y a probablement un bogue dans votre pilote d' affichage. Essayez le code suivant sans utiliser LittlevGL :

```
#define BUF_W 20
#define BUF_H 10
lv_color_t buf[BUF_W * BUF_H];
lv_color_t * buf_p = buf;
uint16_t x, y;
for(y = 0; y < BUF_H; y++) {
    lv_color_t c = lv_color_mix(LV_COLOR_BLUE, LV_COLOR_RED, (y * 255) / BUF_H);
    for(x = 0; x < BUF_W; x++){
        (*buf_p) = c;
        buf_p++;
    }
}

lv_area_t a;
a.x1 = 10;
a.y1 = 40;
a.x2 = a.x1 + BUF_W - 1;
a.y2 = a.y1 + BUF_H - 1;
my_flush_cb(NULL, &a, buf);
```

## 3.9 Pourquoi vois-je des couleurs incorrectes à l' écran ?

Le format de couleur de LittlevGL n' est probablement pas compatible avec le format de couleur de votre écran. Vérifiez `LV_COLOR_DEPTH` dans `lv_conf.h`.

Si vous utilisez des couleurs 16 bits avec SPI (ou toute autre interface orientée octets), vous devez probablement définir `LV_COLOR_16_SWAP 1` dans `lv_conf.h`. Les octets supérieurs et inférieurs des pixels seront échangés.

## 3.10 Comment accélérer mon interface utilisateur ?

- Activez les optimisations du compilateur
- Augmentez la taille du tampon d' affichage
- Utilisez 2 tampons d' affichage et transférez le tampon en DMA (ou une technique similaire) en arrière-plan
- Augmentez la vitesse de fonctionnement des ports SPI ou parallèle si vous les utilisez pour piloter l' affichage
- Si votre écran dispose d' un port SPI, envisagez de passer à un modèle avec port parallèle, car son débit est beaucoup plus élevé.
- Conservez le tampon d' affichage dans la MEV interne (pas dans la SRAM externe) car LittlevGL l' utilise intensivement ce qui implique un temps d' accès minimal.

## 3.11 Comment réduire l' utilisation de mémoire flash/MEM ?

Vous pouvez désactiver toutes les fonctionnalités (animations, système de fichiers, GPU, etc.) et les types d' objet non utilisés dans `lv_conf.h`.

Si vous utilisez GCC, vous pouvez ajouter



- `-fdata-sections -ffunction-sections` aux options du compilateur
- `--gc-sections` aux options de l'éditeur de liens

pour supprimer les fonctions et variables inutilisées.

## 3.12 Comment réduire l' utilisation de la MEV

- Réduisez la taille du *tampon d' affichage*
- Réduisez `LV_MEM_SIZE` dans *lv\_conf.h*. Cette mémoire est utilisée lorsque vous créez des objets tels que des boutons, des étiquettes, etc.
- Pour travailler avec un `LV_MEM_SIZE` réduit, vous pouvez créer les objets uniquement à l' utilisation et les supprimer lorsqu' ils ne sont plus nécessaires.

## 3.13 Comment travailler avec un système d' exploitation ?

Pour travailler avec un système d' exploitation où les tâches peuvent s' interrompre, vous devez protéger les appels de fonctions liés à LittlevGL avec un mutex. Consultez la section *Système d' exploitation et interruption* pour en savoir plus.

## 3.14 Comment contribuer à LittlevGL ?

Il y a plusieurs façons de contribuer à LittlevGL :

- Ecrivez quelques lignes sur votre projet pour inspirer les autres
- Répondez aux questions des autres
- Signalez et/ou corrigez des bogues
- Suggérez et/ou implémentez de nouvelles fonctionnalités
- Améliorez et/ou traduisez la documentation
- Ecrivez un article de blog sur vos expériences

Pour en savoir plus, consultez le [Guide de contribution](#)

## 3.15 Comment LittlevGL est-il versionné ?

LittlevGL suit les règles de [gestion sémantique de version](#) :

- Versions *majeures* pour les modifications incompatibles de l' API. P.ex. 5.0.0, 6.0.0
- Versions *mineures* pour des fonctionnalités nouvelles mais compatibles avec les versions antérieures. P.ex. 6.1.0, 6.2.0
- Versions *correctives* pour les corrections de bogues à compatibilité ascendante. P.ex. 6.1.1, 6.1.2

Les nouvelles versions sont développées dans les branches `dev-X.Y` sur GitHub. Elles peuvent être clonées pour tester les fonctionnalités les plus récentes. Cependant, tout peut être modifié dans ces branches.

Les corrections de bogues sont ajoutées directement à la branche `master` sur GitHub et une version de correction de bogues est créée chaque mois.

## 3.16 Où puis-je trouver la documentation de la version précédente (5.3) ?

Vous pouvez la télécharger ici et l' ouvrir hors ligne :

`Docs-v5-3.zip`

### 3.16.1 Démarrer

#### Démonstrations en ligne

Vous pouvez découvrir à quoi ressemble LittlevGL sans installer ou télécharger quoi que ce soit, sur la plateforme cible ou sur l' ordinateur de développement. Il existe des interfaces utilisateurs prêtes à être essayées facilement dans votre navigateur.

Allez à la page [Démonstrations en ligne](#) et choisissez la démonstration qui vous intéresse.

#### Simulateur sur PC

Vous pouvez essayer LittlevGL **en utilisant uniquement votre PC** (c' est-à-dire sans carte de développement). LittlevGL fonctionnera sur un environnement de simulation sur le PC dans lequel il est possible d' écrire et d' expérimenter de réelles applications LittlevGL.

Le simulateur sur PC présente les avantages suivants :

- Indépendant du matériel - Écrivez du code, exécutez-le sur PC et visualisez le résultat sur le moniteur du PC.
- Multi-plateforme - Tous les ordinateurs Windows, Linux ou OS X peuvent exécuter le simulateur PC.
- Portabilité - Le code écrit est portable, ce qui signifie qu' il suffit de le copier pour l' utiliser sur un matériel embarqué.
- Validation facile - Le simulateur est également très utile pour signaler des bogues car il représente une plateforme commune pour chaque utilisateur. C' est donc une bonne idée de reproduire un bogue dans le simulateur et d' utiliser l' extrait de code dans le [forum](#).

#### Choisir un EDI

Le simulator est porté sur plusieurs EDIs (Environnement de Développement Intégré). Choisissez votre EDI préféré, lisez son README sur GitHub, téléchargez le projet, et chargez le dans EDI.

Vous pouvez utiliser n' importe quel EDI pour le développement mais, pour des raisons de simplicité, ce didacticiel est axé sur la configuration d' Eclipse CDT. La section suivante décrit la configuration d' Eclipse CDT de manière plus détaillée.

**Note :** si vous utilisez Windows, il est généralement préférable d' utiliser Visual Studio ou CodeBlocks. Ils fonctionnent directement sans nécessiter d' étapes supplémentaires.

## Configurer Eclipse CDT

### Installer Eclipse CDT

Eclipse CDT iest un IDE C/C++.

Eclipse est un logiciel écrit en Java de ce fait, soyez certain que l’ **environnement d’ exécution Java** est installé sur votre système.

Sur les distribution basée sur Debian (p.ex. Ubuntu) : `sudo apt-get install default-jre`

Note : si vous utilisez d’ autres distributions, installez un ‘Java Runtime Environment’ adapté à votre distribution.

Vous pouvez télécharger Eclipse CDT à partir de : <https://eclipse.org/cdt/downloads.php>. Démarrez l’ installateur est choisissez *Eclipse CDT* dans la liste.

### Installer SDL 2

Le simulateur PC utilise la librairie multi-plateforme **SDL 2** pour simuler un écran TFT et un pavé tactile.

#### Linux

Sur **Linux** vous pouvez installer facilement SDL 2 à partir d’ un terminal :

1. Trouvez la version actuelle de SDL 2 : `apt-cache search libsdl2` (e.g. `libsdl2-2.0-0`)
2. Installez SDL 2 : `sudo apt-get install libsdl2-2.0-0` (remplacez par la version trouvée)
3. Installez le paquet de développement de SDL 2 : `sudo apt-get install libsdl2-dev`
4. Si les paquets de construction essentiels ne sont pas déjà installés : `sudo apt-get install build-essential`

#### Windows

Si vous utilisez **Windows** vous devez en premier lieu installer MinGW (version 64 bits). Après ça, effectuez les étapes suivantes pour ajouter SDL 2 :

1. Téléchargez les libraries de développement de SDL. Allez sur <https://www.libsdl.org/download-2.0.php> et téléchargez *Development Libraries: SDL2-devel-2.0.5-mingw.tar.gz*
2. Décompressez l’ archive et allez dans le répertoire `x86_64-w64-mingw32` (pour MinGW 64 bits) ou `i686-w64-mingw32` (pour MinGW 32 bits)
3. Copiez le répertoire `...mingw32/include/SDL2` vers `C:/MinGW/.../x86_64-w64-mingw32/include`
4. Copiez le contenu de `...mingw32/lib/` dans `C:/MinGW/.../x86_64-w64-mingw32/lib`
5. Copiez `...mingw32/bin/SDL2.dll` dans `{eclipse_workspace}/pc_simulator/Debug/`. Faites le plus tard quand Eclipse est installé.

Note : si vous utilisez **Microsoft Visual Studio** à la place d’ Eclipse alors vous n’ avez pas besoin d’ installer MinGW.

## OS X

Sur **OS X** vous pouvez facilement installer SDL 2 avec brew : `brew install sdl2`

Si quelque chose ne fonctionne pas, alors référez-vous à ce [tutoriel](#) pour débiter avec SDL.

### Projet pré-configuré

Un projet pré-configuré pour la librairie graphique, basé sur la dernière version publiée, est toujours disponible. Vous pouvez trouver le plus récent sur [GitHub](#) ou sur la page de [téléchargement](#). Notez que le projet est configuré pour Eclipse CDT.

### Ajouter le projet pré-configuré à Eclipse CDT.

Lancez Eclipse CDT. Une boîte de dialogue au sujet du **chemin de l' espace de travail** est affichée. Avant de la valider, vérifiez le chemin et copiez à cet emplacement, puis décompressez, le projet pré-configuré préalablement téléchargé. Après ça vous pouvez accepter le chemin de l' espace de travail. Bien entendu, ce chemin peut être modifié mais dans ce cas il faut copier le projet vers l' emplacement correspondant.

Fermez la fenêtre de démarrage et allez à **Fichier->Importer...** et choisissez **Généralités->Projets existants dans l' espace de travail**. Allez au répertoire racine du projet et cliquez **Terminer**

Sur **Windows** vous devez effectuer deux actions additionnelles :

- Copiez le fichier **SDL2.dll** dans le répertoire Debug du projet
- Faites un clic droit sur le projet -> Propriétés -> Génération C/C++ -> Paramètres -> Bibliothèques -> Ajouter...et ajoutez *mingw32* au-dessus de SDLmain et SDL. L' ordre est important : mingw32, SDLmain, SDL

### Compilation et exécution

Vous êtes maintenant prêt à utiliser la librairie graphique LittlevGL sur votre PC. Cliquer sur l' icône Marteau de la barre de menu pour compiler le projet. Si vous avez tout fait correctement aucune erreur ne se produira. Notez que sur certains systèmes des étapes additionnelles peuvent être requises pour qu' Eclipse prenne en compte SDL 2, mais dans la plupart des cas, la configuration du projet téléchargé est suffisante.

Après avoir compiler avec succès, cliquez sur le bouton Jouer de la barre de menu pour démarrer le projet. Maintenant une fenêtre doit apparaître au milieu de l' écran.

Tout est prêt pour utiliser la librairie graphique LittlevGL pour l' apprentissage ou pour débiter le développement sur votre PC.

### Aperçu rapide

Ici, vous pouvez apprendre les points les plus importants sur LittlevGL. Vous devriez le lire en premier pour avoir une impression générale, puis les sections détaillées *Portage* et *Vue d' ensemble* après cela.

### Ajouter LittlevGL à votre projet

Les étapes suivantes montrent comment configurer LittlevGL sur un système embarqué avec un écran et un pavé tactile. Vous pouvez utiliser le *Simulateur* pour obtenir des projets 'prêts à utiliser' pouvant être exécutés sur votre PC.

- Téléchargez ou clonez la librairie
- Copiez le répertoire `lvgl` dans votre projet
- Copiez `lvgl/lv_conf_templ.h` sous le nom `lv_conf.h` au même niveau que le répertoire `lvgl` et définissez au minimum les macros `LV_HOR_RES_MAX`, `LV_VER_RES_MAX` et `LV_COLOR_DEPTH`.
- Incluez `lvgl/lvgl.h` quand vous devez utiliser les fonctions de LittlevGL.
- Appelez `lv_tick_inc(x)` chaque `x` millisecondes à **partir d' une horloge ou d' une tâche** (`x` doit être compris entre 1 et 10). Ceci est requis pour la synchronisation interne de LittlevGL.
- Appelez `lv_init()`
- Créez un tampon d' affichage pour LittlevGL

```
static lv_disp_buf_t disp_buf;
static lv_color_t buf[LV_HOR_RES_MAX * 10];           /* Déclare un tampon
↳pour 10 lignes */
lv_disp_buf_init(&disp_buf, buf, NULL, LV_HOR_RES_MAX * 10); /* Initialise le
↳tampon d'affichage */
```

- Implémentez et enregistrez une fonction qui **copie un tableau de pixels** vers une zone de l' écran :

```
lv_disp_drv_t disp_drv;           /* Descripteur du pilote d'affichage */
lv_disp_drv_init(&disp_drv);       /* Initialisation de base */
disp_drv.flush_cb = my_disp_flush; /* Définit la fonction du pilote */
disp_drv.buffer = &disp_buf;       /* Définit le tampon d'affichage */
lv_disp_drv_register(&disp_drv);    /* Finalement, enregistre le pilote */

void my_disp_flush(lv_disp_t * disp, const lv_area_t * area, lv_color_t * color_p)
{
    int32_t x, y;
    for(y = area->y1; y <= area->y2; y++) {
        for(x = area->x1; x <= area->x2; x++) {
            set_pixel(x, y, *color_p); /* Définit la couleur d'un pixel de l'écran.*/
            color_p++;
        }
    }

    lv_disp_flush_ready(disp);       /* Indique que les données peuvent être
↳transférées à l'écran */
}
```

- Implémentez et enregistrez une fonction qui peut **lire un périphérique d' entrée**. P.ex. pour un pavé tactile :

```
lv_indev_drv_t indev_drv;          /* Descripteur du pilote du périphérique d
↳entrée */
lv_indev_drv_init(&indev_drv);       /* Initialisation de base */
indev_drv.type = LV_INDEV_TYPE_POINTER; /* Le pavé tactile est un périphérique
↳semblable à un pointeur */
indev_drv.read_cb = my_touchpad_read; /* Définit la fonction du pilote */
lv_indev_drv_register(&indev_drv);    /* Finalement, enregistre le pilote */

bool my_touchpad_read(lv_indev_t * indev, lv_indev_data_t * data)
{
    static lv_coord_t last_x = 0;
    static lv_coord_t last_y = 0;
```

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```

/* Mémorise l'état et les coordonnées, si pressé */
data->state = touchpad_is_pressed() ? LV_INDEV_STATE_PR : LV_INDEV_STATE_REL;
if(data->state == LV_INDEV_STATE_PR) touchpad_get_xy(&last_x, &last_y);

/* Définit les coordonnées (si relâché, les dernières coordonnées quand pressé) */
data->point.x = last_x;
data->point.y = last_y;

return false; /* Retourne `faux` car pas de tampon et plus de données à lire */
}

```

- Appelez `lv_task_handler()` périodiquement, chaque quelques millisecondes, dans la boucle principale `while(1)`, sur interruption d' une horloge ou à partir d' une tâche du système d' exploitation. Cela redessine l' écran si nécessaire, gère les périphériques d' entrée, etc.

## Apprendre les bases

### Les objets (éléments visuels)

Les éléments graphiques tels que les boutons, les étiquettes, les curseurs, les graphiques, etc. sont appelés des objets dans LittlevGL. Allez à [Types d' objet] (/object-types/index) pour voir la liste complète des types disponibles.

Chaque objet possède un objet parent. L' objet enfant se déplace avec le parent et si vous supprimez le parent, les enfants seront également supprimés. Les enfants ne peuvent être visibles que sur leurs parents.

L' *écran* est le parent “racine”. Pour obtenir l' écran actuel, appelez `lv_scr_act()`.

Vous pouvez créer un nouvel objet avec `lv_<type>_create(parent, obj_to_copy)`. Une variable `lv_obj_t *` est retournée qui doit être utilisée comme référence à l' objet pour définir ses paramètres. Le premier paramètre est le *parent* souhaité, le second paramètre peut être un objet à copier (`NULL` si inutilisé). Par exemple :

```
lv_obj_t * slider1 = lv_slider_create(lv_scr_act(), NULL);
```

Pour définir certains attributs de base les fonctions `lv_obj_set_<parameter_name>(obj, <value>)` peuvent être utilisées. Par exemple :

```
lv_obj_set_x(btn1, 30);
lv_obj_set_y(btn1, 10);
lv_obj_set_size(btn1, 200, 50);
```

Les objets ont également des paramètres spécifiques au type qui peuvent être définis par les fonctions `lv_<type>_set_<parameter_name>(obj, <valeur>)`. Par exemple :

```
lv_slider_set_value(slider1, 70, LV_ANIM_ON);
```

Pour voir l' API complète, consultez la documentation des types d' objet ou le fichier d' en-tête associé (p.ex. `lvgl/src/lv_objx/lv_slider.h`).

## Styles

Les styles peuvent être affectés aux objets pour changer leur apparence. Un style décrit tout à la fois l' apparence des objets de type rectangle (comme un bouton ou un curseur), des textes, des images et des

lignes.

Voici comment créer un nouveau style :

```
static lv_style_t style1;           /* Déclare un nouveau style. Devrait être ↵
↪ `static` */
lv_style_copy(&style1, &lv_style_plain); /* Copie un style intégré */
style1.body.main_color = LV_COLOR_RED; /* Couleur principale */
style1.body.grad_color = lv_color_hex(0xffd83c) /* Dégradé de couleur (orange) */
style1.body.radius = 3;
style1.text.color = lv_color_hex3(0x0F0) /* Couleur de texte (vert) */
style1.text.font = &lv_font_dejavu_22; /* Change la police */
...
```

Pour appliquer un nouveau style à un objet, utilisez les fonctions `lv_<type>set_style(obj, LV_<TYPE>_STYLE_<NOM>, &my_style)`. Par exemple :

```
lv_slider_set_style(slider1, LV_SLIDER_STYLE_BG, &slider_bg_style);
lv_slider_set_style(slider1, LV_SLIDER_STYLE_INDIC, &slider_indic_style);
lv_slider_set_style(slider1, LV_SLIDER_STYLE_KNOB, &slider_knob_style);
```

Si le style d'un objet est `NULL`, il héritera du style de son parent. Par exemple, le style des étiquettes est `NULL` par défaut. Si vous les placez sur un bouton, elles utiliseront les propriétés `style.text` du style du bouton.

Apprenez-en plus dans la section *Styles*.

## Événements

Les événements sont utilisés pour informer l'utilisateur si quelque chose s'est produit avec un objet. Vous pouvez affecter une fonction de rappel à un objet qui sera appelée si l'objet est cliqué, relâché, déplacé, en cours de suppression, etc. Voici à quoi cela ressemble :

```
lv_obj_set_event_cb(btn, btn_event_cb); /* Affecte une fonction de ↵
↪ rappel au bouton */
...
void btn_event_cb(lv_obj_t * btn, lv_event_t event)
{
    if(event == LV_EVENT_CLICKED) {
        printf("Cliqué\n");
    }
}
```

Apprenez-en plus dans la section *événements*.

## Exemples

### Bouton avec étiquette

```
lv_obj_t * btn = lv_btn_create(lv_scr_act(), NULL); /* Ajoute un bouton à l'écran ↵
↪ actuel */
lv_obj_set_pos(btn, 10, 10); /* Définit sa position */
```

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```
lv_obj_set_size(btn, 100, 50);           /*Définit sa taille */
lv_obj_set_event_cb(btn, btn_event_cb);  /* Affecte une fonction de
↳rappel au bouton */

lv_obj_t * label = lv_label_create(btn, NULL);  /* Ajoute une étiquette au
↳bouton */
lv_label_set_text(label, "Button");           /* Définit le texte de l
↳'étiquette */

...

void btn_event_cb(lv_obj_t * btn, lv_event_t event)
{
    if(event == LV_EVENT_CLICKED) {
        printf("Cliqué\n");
    }
}
```



### Bouton avec styles

Ajoutez des styles au bouton de l' exemple précédent :

```
static lv_style_t style_btn_rel;           /* Une variable pour
↳enregistrer le style relâché */
lv_style_copy(&style_btn_rel, &lv_style_plain);  /* Initialise à partir d'un
↳style intégré */
style_btn_rel.body.border.color = lv_color_hex3(0x269);
style_btn_rel.body.border.width = 1;
style_btn_rel.body.main_color = lv_color_hex3(0xADF);
style_btn_rel.body.grad_color = lv_color_hex3(0x46B);
style_btn_rel.body.shadow.width = 4;
style_btn_rel.body.shadow.type = LV_SHADOW_BOTTOM;
style_btn_rel.body.radius = LV_RADIUS_CIRCLE;
style_btn_rel.text.color = lv_color_hex3(0xDEF);

static lv_style_t style_btn_pr;           /* Une variable pour
↳enregistrer le style pressé */
lv_style_copy(&style_btn_pr, &style_btn_rel);  /* Initialise à partir du
↳style relâché */
style_btn_pr.body.border.color = lv_color_hex3(0x46B);
style_btn_pr.body.main_color = lv_color_hex3(0x8BD);
style_btn_pr.body.grad_color = lv_color_hex3(0x24A);
style_btn_pr.body.shadow.width = 2;
style_btn_pr.text.color = lv_color_hex3(0xBCD);

lv_btn_set_style(btn, LV_BTN_STYLE_REL, &style_btn_rel);  /* Définit le style
↳relâché du bouton */
lv_btn_set_style(btn, LV_BTN_STYLE_PR, &style_btn_pr);    /* Définit le style
↳pressé du bouton */
```





### Curseur et alignement de l' objet

```
lv_obj_t * label;

...

/* Crée un curseur au centre de l'affichage */
lv_obj_t * slider = lv_slider_create(lv_scr_act(), NULL);
lv_obj_set_width(slider, 200);           /* Définit la largeur */
lv_obj_align(slider, NULL, LV_ALIGN_CENTER, 0, 0); /* Aligne au centre du parent
↳(écran) */
lv_obj_set_event_cb(slider, slider_event_cb); /* Affecte une fonction de
↳rappel */

/* Crée une étiquette sous le curseur */
label = lv_label_create(lv_scr_act(), NULL);
lv_label_set_text(label, "0");
lv_obj_set_auto_realign(slider, true);
lv_obj_align(label, slider, LV_ALIGN_OUT_BOTTOM_MID, 0, 10);

...

void slider_event_cb(lv_obj_t * slider, lv_event_t event)
{
    if(event == LV_EVENT_VALUE_CHANGED) {
        static char buf[4];           /* Maximum 3 octets pour
↳le nombre plus 1 octet final nul */
        snprintf(buf, 4, "%u", lv_slider_get_value(slider));
        lv_label_set_text(slider_label, buf); /* Actualise le texte */
    }
}
```



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### Liste et thèmes

```
/* Textes des éléments de la liste */
const char * txts[] = {"First", "Second", "Third", "Fourth", "Fifth", "Sixth", NULL};

/* Initialise et définit un thème. `LV_THEME_NIGHT` doit être activé dans lv_conf.h.
↳*/
lv_theme_t * th = lv_theme_night_init(20, NULL);
```

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```
lv_theme_set_current(th);

/* Crée une liste */
lv_obj_t* list = lv_list_create(lv_scr_act(), NULL);
lv_obj_set_size(list, 120, 180);
lv_obj_set_pos(list, 10, 10);

/* Ajoute des boutons */
uint8_t i;
for(i = 0; txts[i]; i++) {
    lv_obj_t * btn = lv_list_add_btn(list, LV_SYMBOL_FILE, txts[i]);
    lv_obj_set_event_cb(btn, list_event);      /* Affecte une fonction de rappel */
    lv_btn_set_toggle(btn, true);              /* Active la fonction de bascule */
}

/* Initialise et définit un autre thème. `LV_THEME_MATERIAL` doit être activé dans lv_
↳ conf.h.
* Si `LV_THEME_LIVE_UPDATE 1` alors le style de la liste précédente sera également
↳ mis à jour. */
th = lv_theme_material_init(210, NULL);
lv_theme_set_current(th);

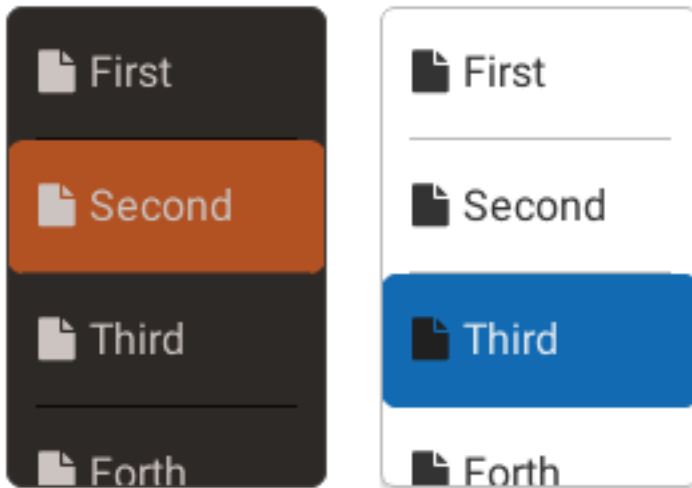
/* Crée une autre liste */
list = lv_list_create(lv_scr_act(), NULL);
lv_obj_set_size(list, 120, 180);
lv_obj_set_pos(list, 150, 10);

/* Ajoute des boutons avec les mêmes textes */
for(i = 0; txts[i]; i++) {
    lv_obj_t * btn = lv_list_add_btn(list, LV_SYMBOL_FILE, txts[i]);
    lv_obj_set_event_cb(btn, list_event);
    lv_btn_set_toggle(btn, true);
}

...

static void list_event(lv_obj_t * btn, lv_event_t e)
{
    if(e == LV_EVENT_CLICKED) {
        printf("%s\n", lv_list_get_btn_text(btn));
    }
}

}
```



## Utiliser LittlevGL avec Micropython

Apprenez-en plus sur *Micropython*.

```
# Crée un bouton et une étiquette
scr = lv.obj()
btn = lv.btn(scr)
btn.align(lv.scr_act(), lv.ALIGN.CENTER, 0, 0)
label = lv.label(btn)
label.set_text("Button")

# Charge l'écran
lv.scr_load(scr)
```

## Contribuer

LittlevGL utilise le [forum](#) pour poser et répondre aux questions et l' [outil de suivi des problèmes de GitHub](#) pour les discussions relatives au développement (comme les rapports de bogues, les suggestions de fonctionnalités etc.).

Il existe de nombreuses possibilités de contribuer à LittlevGL telles que :

- **Aidez les autres** sur le [forum](#).
- **Inspirez les gens** en parlant de votre projet dans la catégorie [Mon projet](#) du forum ou en l' ajoutant à la rubrique [Références](<https://blog.littlevgl.com/2018-12-26/references>)
- **Améliorez et/ou traduisez la documentation**. Visitez le dépôt [Documentation](#) pour en apprendre plus **Écrivez un article de blog** sur vos expériences. Regardez comment faire dans le dépôt [Blog] (<https://github.com/littlevgl/blog>).
- **Signalez et/ou corrigez des bogues** avec l' outil de suivi des problèmes de [GitHub](#)
- **Aidez au développement**. Vérifiez les [problèmes en cours](#), en particulier ceux avec la mention [Aide demandée](#) et partagez vos idées sur un sujet ou implémentez une fonctionnalité.

Si vous souhaitez contribuer à LittlevGL, veuillez lire les guides ci-dessous pour commencer.

- [Guide de contribution](#)

- [Guide de convention de code](#)

## Micropython

### Qu' est-ce que Micropython ?

[Micropython](#) est une version de Python destinées aux microcontrôleurs. En utilisant Micropython vous pouvez écrire du code Python 3 et l' exécuter directement sur des architectures aux ressources limitées.

### Points forts de Micropython

- **Compact** - s' exécute dans seulement 256 ko d' espace de code et 16 ko de MEV. Aucun SE n' est nécessaire, bien qu' il soit possible de l' exécuter sur un SE, si vous le souhaitez.
- **Compatible** - s' efforce d' être aussi compatible que possible avec le Python de référence (CPython).
- **Adaptable** - supporte de multiples architectures (x86, x86-64, ARM, ARM Thumb, Xtensa).
- **Interactif** - le cycle compilation-programmation-démarrage n' est pas nécessaire. Avec REPL (l' invite interactive) vous pouvez entrer des commandes et les exécuter immédiatement, lancer des scripts etc.
- **Populaire** - de nombreuses plateformes sont supportées. Le nombre d' utilisateurs est en constante augmentation. Variantes notables : [MicroPython](#), [CircuitPython](#), [MicroPython\\_ESP32\\_psRAM\\_LoBo](#)
- **Orienté embarqué** - fourni avec des modules spécifiques aux systèmes embarqués, comme le module [machine](#) pour accéder au matériel bas-niveau (broches d' E/S, CAN, UART, SPI, I2C, RTC, horloges etc.)

---

### Pourquoi Micropython + LittlevGL ?

Actuellement, par défaut, Micropython ne dispose pas d' une bonne librairie de haut-niveau pour réaliser des interfaces graphiques. LittlevGL est une librairie basée sur l' utilisation de composants orientés objet, ce qui en fait une candidate idéale pour s' interfacer à un langage de plus haut-niveau tel que Python. LittlevGL est implémentée en C et ses APIs sont en C.

### Voici quelques avantages à utiliser LittlevGL avec Micropython :

- Développez des interfaces graphiques en Python, langage de haut-niveau très populaire. Utilisez des paradigmes tels que la programmation orientée objet.
- Actuellement, le développement d' interface graphique nécessite de nombreuses itérations pour obtenir un résultat correct. Avec C, chaque itération nécessite de **modifier le code > compiler > programmer > exécuter**. En Micropython il faut seulement **modifier le code > exécuter**. Vous pouvez même exécuter des commandes de manière interactive en utilisant [REPL](#) (l' invite interactive)

## Micropython + LittlevGL peuvent être utilisés pour :

- Le prototypage rapide d' interface graphique.
- Réduire le cycle de modification et d' optimisation de l' interface graphique.
- Modéliser l' interface graphique d' une manière plus abstraite en définissant des objets composites réutilisables, en tirant avantage des fonctionnalités du langage Python telles que l' héritage, les clôtures, les listes en compréhension, les générateurs, la gestion d' exception, les entiers multiprécision et autres.
- Rendre LittlevGL accessible à une plus large audience. Aucun besoin de connaître le C dans le but de créer une interface graphique fonctionnelle sur un système embarqué.C' est également vrai pour [CircuitPython vision](#). CircuitPython a été conçu avec l' éducation à l' esprit, pour rendre plus facile à des utilisateurs, nouveaux ou inexpérimentés, de débiter avec le développement embarqué.
- Création d' outils pour utiliser LittlevGL à un niveau supérieur (concepteur graphique par glisser-déposer, par exemple).

## Alors, à quoi ça ressemble ?

TL;DR : C' est très similaire à l' API C, mais orienté objet pour les composants de LittlevGL.

Plongeons droit dans un exemple !

## Un exemple simple

```
import lvgl as lv
lv.init()
scr = lv.obj()
btn = lv.btn(scr)
btn.align(lv.scr_act(), lv.ALIGN.CENTER, 0, 0)
label = lv.label(btn)
label.set_text("Button")
lv.scr_load(scr)
```

## Comment l' utiliser?

### Simulateur en ligne

Si vous souhaitez expérimenter LittlevGL + Micropython sans télécharger quoi que ce soit - vous pouvez utiliser notre simulateur en ligne !C' est un ensemble LittlevGL + Micropython entièrement fonctionnel qui s' exécute dans le navigateur et permet d' éditer et d' exécuter un script Python.

[Click here to experiment on the online simulator](#)

Hello World

## Simulateur PC

Micropython est porté sur de nombreuses plateformes, dont Unix, ce qui permet de compiler et exécuter Micropython (+ LittlevGL) sur une machine Linux (sur une machine Windows, d'autres outils peuvent être nécessaires : VirtualBox ou WSL ou MinGW ou Cygwin etc.).

Cliquez [ici](#) pour en savoir plus sur la compilation et l'utilisation du port Unix

## Plateforme embarquée

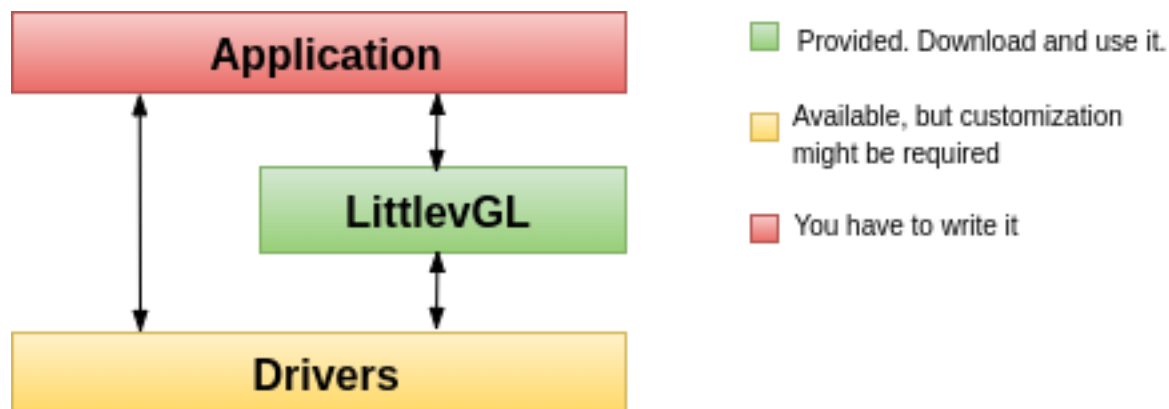
Au final, le but est d'exécuter sur une plateforme embarquée. Micropython et LittlevGL peuvent être utilisés sur de nombreuses architectures embarquées, telles que STM32, ESP32 etc. Vous aurez également besoin de pilotes d'affichage et d'entrée. Nous avons quelques exemples de pilotes (ESP32 + ILI9341, ainsi que d'autres exemples), mais il est fort probable que vous souhaitiez créer vos propres pilotes d'affichage et d'entrée pour vos besoins spécifiques. Les pilotes peuvent être implémentés soit en C en tant que module Micropython, soit en Micropython pur !

## Où trouver plus d'informations ?

- Dans le sujet du [Blog](#)
- Dans le [README lv\\_micropython](#)
- Dans le [README lv\\_binding\\_micropython](#)
- Sur le forum LittlevGL (n'hésitez pas à demander quoi que ce soit !)
- Dans la [documentation](#) et sur le [forum](#) Micropython

### 3.16.2 Portage

#### Aperçu système



**Application** Votre application qui crée l'interface graphique et gère les tâches spécifiques.

**LittlevGL** La bibliothèque graphique elle-même. Votre application peut communiquer avec la bibliothèque pour créer une interface graphique. Elle contient une interface HAL (Hardware Abstraction Layer, couche d'abstraction matérielle) permettant d'enregistrer vos pilotes de périphérique d'affichage et d'entrée.

**Pilote** Outre vos pilotes spécifiques, il contient des fonctions pour gérer l'écran, éventuellement un GPU (processeur graphique), et lire un pavé tactile ou des boutons.

Selon le microcontrôleur, il existe deux configurations matérielles typiques? Une avec contrôleur LCD/TFT intégré et l'autre sans. Dans les deux cas, un tampon d'affichage sera nécessaire pour mémoriser l'image actuelle de l'écran.

1. **Microcontrôleur avec contrôleur TFT/LCD** Si votre microcontrôleur dispose d'un contrôleur TFT/LCD, vous pouvez connecter un écran directement via une interface RVB. Dans ce cas, le tampon d'affichage peut résider dans la MEV interne (si le microcontrôleur dispose de suffisamment de MEV) ou dans la MEV externe (si le microcontrôleur a une interface mémoire).
2. **Contrôleur d'affichage externe** Si votre microcontrôleur ne dispose pas d'un contrôleur TFT/LCD alors un contrôleur d'affichage externe (par exemple SSD1963, SSD1306, ILI9341) doit être utilisé. Dans ce cas, le microcontrôleur peut communiquer avec le contrôleur d'affichage via un port parallèle, SPI ou parfois I2C. Le tampon d'affichage est généralement situé dans le contrôleur d'affichage, ce qui économise beaucoup de MEV pour le microcontrôleur.

## Configurer un projet

### Obtenir la librairie

LittlevGL Graphics Library is available on GitHub: <https://github.com/littlevgl/lvgl>.

You can clone it or download the latest version of the library from GitHub or you can use the [Download](#) page as well.

La librairie graphique est le répertoire **lvgl** qui doit être copié dans votre projet.

### Configuration file

There is a configuration header file for LittlevGL called **lv\_conf.h**. It sets the library's basic behaviour, disables unused modules and features, adjusts the size of memory buffers in compile-time, etc.

Copy **lvgl/lv\_conf\_template.h** next to the *lvgl* directory and rename it to *lv\_conf.h*. Open the file and change the **#if 0** at the beginning to **#if 1** to enable its content.

*lv\_conf.h* can be copied other places as well but then you should add **LV\_CONF\_INCLUDE\_SIMPLE** define to your compiler options (e.g. **-DLV\_CONF\_INCLUDE\_SIMPLE** for gcc compiler) and set the include path manually.

Dans le fichier de configuration, les commentaires expliquent la signification des options. Vérifiez au moins ces trois options de configuration et modifiez-les en fonction de votre matériel :

1. **LV\_HOR\_RES\_MAX** Your display's horizontal resolution.
2. **LV\_VER\_RES\_MAX** Your display's vertical resolution.
3. **LV\_COLOR\_DEPTH** 8 for (RG32), 16 for (RGB565) or 32 for (RGB888 and ARGB8888).

### Initialisation

To use the graphics library you have to initialize it and the other components too. The order of the initialization is:

1. Call *lv\_init()*.
2. Initialize your drivers.

3. Enregistrez les pilotes de périphérique d’affichage et d’entrée dans LittlevGL. En savoir plus sur l’enregistrement : *Affichage* et *Périphérique d’entrée*.
4. Appelez `lv_tick_inc(x)` toutes les `x` millisecondes dans une interruption pour indiquer le temps écoulé. *En savoir plus*.
5. Appelez `lv_task_handler()` périodiquement toutes les quelques millisecondes pour gérer les tâches liées à LittlevGL. *En savoir plus*.

## Interface d’affichage

Pour configurer un affichage, les variables `lv_disp_buf_t` et `lv_disp_drv_t` doivent être initialisées.

- `lv_disp_buf_t` contient le(s) tampon(s) graphique(s) interne(s).
- `lv_disp_drv_t` contient les fonctions de rappel pour interagir avec l’affichage et manipuler des éléments liés au dessin.

## Tampon d’affichage

`lv_disp_buf_t` peut être initialisé comme ceci :

```
/* Une variable statique ou globale pour mémoriser les tampons */
static lv_disp_buf_t disp_buf;

/* Tampon(s) statique(s) ou global(aux). Le second tampon est optionnel */
static lv_color_t buf_1[MY_DISP_HOR_RES * 10];
static lv_color_t buf_2[MY_DISP_HOR_RES * 10];

/* Initialise `disp_buf` avec le(s) tampon(s) */
lv_disp_buf_init(&disp_buf, buf_1, buf_2, MY_DISP_HOR_RES*10);
```

Il y a 3 configurations possibles concernant la taille de la mémoire tampon :

1. **Un tampon** LittlevGL dessine le contenu de l’écran dans un tampon et l’envoie à l’affichage. Le tampon peut être plus petit que l’affichage. Dans ce cas, les zones les plus grandes seront redessinées en plusieurs parties. Si seules de petites zones changent (p.ex. appui sur un bouton), seules ces zones seront actualisées.
2. **Deux tampons de taille différente de l’écran** ayant deux tampons LittlevGL peut dessiner dans un tampon tandis que le contenu de l’autre tampon est envoyé à l’écran en arrière-plan. Le DMA ou une autre méthode doit être utilisé pour transférer les données à l’écran afin de permettre au CPU de dessiner dans le même temps. De cette manière, le rendu et le rafraîchissement de l’affichage deviennent parallèles. De même que pour *Un tampon*, LittlevGL dessine le contenu de l’affichage en fragments si le tampon est plus petit que la zone à actualiser.
3. **Deux tampons de la taille d’un écran.** Contrairement à *Deux tampons de taille différente de l’écran* LittlevGL fournira toujours tout le contenu de l’affichage, pas seulement des fragments. De cette façon, le pilote peut simplement changer l’adresse du tampon d’affichage par celle du tampon préparé par LittlevGL. Par conséquent, cette méthode est la meilleure lorsque le microcontrôleur dispose d’une interface LCD/TFT et que le tampon d’affichage est un emplacement dans la MEV.

## Pilote d’affichage

Une fois l’initialisation des tampons effectuée, les pilotes d’affichage doivent être initialisés. Dans le cas le plus simple, seuls les deux champs suivants de `lv_disp_drv_t` doivent être définis :



- **buffer** pointeur sur une variable `lv_disp_buf_t` initialisée.
- **flush\_cb** une fonction de rappel permettant de copier le contenu d'un tampon dans une zone spécifique de l' écran.

Il y a quelques champs de données optionnels :

- **hor\_res** résolution horizontale de l' écran. (`LV_HOR_RES_MAX` par défaut à partir de `lv_conf.h`)
- **ver\_res** résolution verticale de l' écran. (`LV_VER_RES_MAX` par défaut à partir de `lv_conf.h`)
- **color\_chroma\_key** une couleur qui sera dessinée de manière transparente sur les images incrustées. `LV_COLOR_TRANSP` par défaut à partir de `lv_conf.h`)
- **\*\* user\_data \*\*** donnée utilisateur personnalisée pour le pilote. Son type peut être modifié dans `lv_conf.h`.
- **\*\* anti-aliasing \*\*** utilise un anti-crénelage (lissage des bords). `LV_ANTIALIAS` par défaut à partir de `lv_conf.h`
- **rotated** si `1` permute **hor\_res** et **ver\_res**. LittlevGL dessine dans le même sens dans les deux cas (lignes du haut vers le bas); le pilote doit donc également être reconfiguré pour modifier le sens de remplissage de l' écran.
- **screen\_transp** si `1` l' écran peut avoir un style transparent ou opaque. `LV_COLOR_SCREEN_TRANSP` doit être activé dans `lv_conf.h`

Pour utiliser un GPU, les fonctions de rappel suivantes peuvent être utilisées :

- **gpu\_fill\_cb** remplit une zone en mémoire avec une couleur
- **gpu\_blend\_cb** combine deux tampons en mémoire avec gestion de l' opacité.

Notez que ces fonctions doivent dessiner en mémoire (MEV) et non directement sur l' affichage.

Certaines autres fonctions de rappel facultatives facilitent et optimisent l' utilisation des écrans monochromes, à niveaux de gris ou autres écrans RVB non standard :

- **rounder\_cb** arrondit les coordonnées des zones à redessiner. Par exemple une zone de 2 x 2 px peut être convertie en 2 x 8. Utile si la carte graphique ne peut actualiser que les zones ayant une hauteur ou une largeur spécifique (généralement une hauteur de 8 px avec des écrans monochromes).
- **set\_px\_cb** une fonction personnalisée pour écrire le *tampon d' affichage*. Utile pour enregistrer les pixels de manière plus compacte si l' affichage présente un format de couleur spécial (par exemple monochrome 1 bit, échelle de gris 2 bit, etc.). De cette façon, les tampons utilisés dans `lv_disp_buf_t` peuvent être plus petits pour ne contenir que le nombre de bits requis pour la taille de zone donnée. **set\_px\_cb** ne fonctionne pas avec la configuration de tampons d' affichage **Deux tampons de la taille d'un écran**.
- **monitor\_cb** indique combien de pixels ont été actualisés et en combien de temps.

Pour définir les champs de la variable `lv_disp_drv_t`, celle-ci doit être initialisée avec `lv_disp_drv_init(&disp_drv)`. Et enfin, pour enregistrer un affichage pour LittlevGL, `lv_disp_drv_register(& disp_drv)` doit être appelée.

Dans l' ensemble, cela ressemble à ceci :

```
lv_disp_drv_t disp_drv;                                /* Une variable pour contenir les pilotes.
↳ Peut être une variable locale */
lv_disp_drv_init(&disp_drv);                            /* Initialisation de base */
disp_drv.buffer = &disp_buf;                            /* Affecte un tampon initialisé */
disp_drv.flush_cb = my_flush_cb;                        /* Définit une fonction de rappel pour
↳ dessiner à l'écran */
```

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```
lv_disp_t * disp;
disp = lv_disp_drv_register(&disp_drv); /* Enregistre le pilote et sauvegarde les
↳objets d'affichage créés */
```

Voici quelques exemples simples de fonctions de rappel :

```
void my_flush_cb(lv_disp_drv_t * disp_drv, const lv_area_t * area, lv_color_t * color_
↳p)
{
    /* Le cas le plus simple (mais aussi le plus lent) pour mettre tous les pixels à l
↳écran un par un */
    int32_t x, y;
    for(y = area->y1; y <= area->y2; y++) {
        for(x = area->x1; x <= area->x2; x++) {
            put_px(x, y, *color_p)
            color_p++;
        }
    }

    /* IMPORTANT !!!
    * Informe la librairie graphique que vous êtes prêt pour le transfert */
    lv_disp_flush_ready(disp);
}

void my_gpu_fill_cb(lv_disp_drv_t * disp_drv, lv_color_t * dest_buf, const lv_area_t
↳* dest_area, const lv_area_t * fill_area, lv_color_t color);
{
    /* Cet exemple de code devrait être effectué par un GPU */
    uint32_t x, y;
    dest_buf += dest_width * fill_area->y1; /* Aller à la première ligne */

    for(y = fill_area->y1; y < fill_area->y2; y++) {
        for(x = fill_area->x1; x < fill_area->x2; x++) {
            dest_buf[x] = color;
        }
        dest_buf+=dest_width; /* Aller à la ligne suivante */
    }
}

void my_gpu_blend_cb(lv_disp_drv_t * disp_drv, lv_color_t * dest, const lv_color_t *
↳src, uint32_t length, lv_opa_t opa)
{
    /* Cet exemple de code devrait être effectué par un GPU */
    uint32_t i;
    for(i = 0; i < length; i++) {
        dest[i] = lv_color_mix(dest[i], src[i], opa);
    }
}

void my_rounder_cb(lv_disp_drv_t * disp_drv, lv_area_t * area)
{
    /* Modifie les zones en fonction des besoins. Agrandir uniquement.
    * Par exemple, pour toujours avoir des lignes de 8 px de hauteur : */
    area->y1 = area->y1 & 0x07;
    area->y2 = (area->y2 & 0x07) + 8;
}
```

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```
void my_set_px_cb(lv_disp_drv_t * disp_drv, uint8_t * buf, lv_coord_t buf_w, lv_coord_t x, lv_coord_t y, lv_color_t color, lv_opa_t opa)
{
    /* Écrit dans le tampon comme requis par l'affichage.
    * Écrit seulement 1 bit pour les écrans monochromes orientés verticalement : * /
    buf += buf_w * (y >> 3) + x;
    if(lv_color_brightness(color) > 128) (*buf) |= (1 << (y % 8));
    else (*buf) &= ~(1 << (y % 8));
}

void my_monitor_cb(lv_disp_drv_t * disp_drv, uint32_t time, uint32_t px)
{
    printf("%d px refreshed in %d ms\n", time, ms);
}
```

## API

Display Driver HAL interface header file

## Typedefs

**typedef struct *lv\_disp\_drv\_t* lv\_disp\_drv\_t**  
Display Driver structure to be registered by HAL

**typedef struct *lv\_disp\_t* lv\_disp\_t**  
Display structure. *lv\_disp\_drv\_t* is the first member of the structure.

## Functions

void **lv\_disp\_drv\_init**(*lv\_disp\_drv\_t* \*driver)  
Initialize a display driver with default values. It is used to have known values in the fields and not junk in memory. After it you can safely set only the fields you need.

### Parameters

- **driver**: pointer to driver variable to initialize

void **lv\_disp\_buf\_init**(*lv\_disp\_buf\_t* \*disp\_buf, void \*buf1, void \*buf2, uint32\_t size\_in\_px\_cnt)  
Initialize a display buffer

### Parameters

- **disp\_buf**: pointer *lv\_disp\_buf\_t* variable to initialize
- **buf1**: A buffer to be used by LittlevGL to draw the image. Always has to be specified and can't be NULL. Can be an array allocated by the user. E.g. `static lv_color_t disp_buf1[1024 * 10]` Or a memory address e.g. in external SRAM
- **buf2**: Optionally specify a second buffer to make image rendering and image flushing (sending to the display) parallel. In the `disp_drv->flush` you should use DMA or similar hardware to send the image to the display in the background. It lets LittlevGL to render next frame into the other buffer while previous is being sent. Set to **NULL** if unused.
- **size\_in\_px\_cnt**: size of the **buf1** and **buf2** in pixel count.

*lv\_disp\_t* \***lv\_disp\_drv\_register**(*lv\_disp\_drv\_t* \**driver*)

Register an initialized display driver. Automatically set the first display as active.

**Return** pointer to the new display or NULL on error

**Parameters**

- **driver**: pointer to an initialized 'lv\_disp\_drv\_t' variable (can be local variable)

void **lv\_disp\_drv\_update**(*lv\_disp\_t* \**disp*, *lv\_disp\_drv\_t* \**new\_drv*)

Update the driver in run time.

**Parameters**

- **disp**: pointer to a display. (return value of lv\_disp\_drv\_register)
- **new\_drv**: pointer to the new driver

void **lv\_disp\_remove**(*lv\_disp\_t* \**disp*)

Remove a display

**Parameters**

- **disp**: pointer to display

void **lv\_disp\_set\_default**(*lv\_disp\_t* \**disp*)

Set a default screen. The new screens will be created on it by default.

**Parameters**

- **disp**: pointer to a display

*lv\_disp\_t* \***lv\_disp\_get\_default**(void)

Get the default display

**Return** pointer to the default display

lv\_coord\_t **lv\_disp\_get\_hor\_res**(*lv\_disp\_t* \**disp*)

Get the horizontal resolution of a display

**Return** the horizontal resolution of the display

**Parameters**

- **disp**: pointer to a display (NULL to use the default display)

lv\_coord\_t **lv\_disp\_get\_ver\_res**(*lv\_disp\_t* \**disp*)

Get the vertical resolution of a display

**Return** the vertical resolution of the display

**Parameters**

- **disp**: pointer to a display (NULL to use the default display)

bool **lv\_disp\_get\_antialiasing**(*lv\_disp\_t* \**disp*)

Get if anti-aliasing is enabled for a display or not

**Return** true: anti-aliasing is enabled; false: disabled

**Parameters**

- **disp**: pointer to a display (NULL to use the default display)

*lv\_disp\_t* \***lv\_disp\_get\_next**(*lv\_disp\_t* \**disp*)

Get the next display.

**Return** the next display or NULL if no more. Give the first display when the parameter is NULL

### Parameters

- **disp**: pointer to the current display. NULL to initialize.

*lv\_disp\_buf\_t* \***lv\_disp\_get\_buf**(*lv\_disp\_t* \*disp)

Get the internal buffer of a display

**Return** pointer to the internal buffers

### Parameters

- **disp**: pointer to a display

uint16\_t **lv\_disp\_get\_inv\_buf\_size**(*lv\_disp\_t* \*disp)

Get the number of areas in the buffer

**Return** number of invalid areas

void **lv\_disp\_pop\_from\_inv\_buf**(*lv\_disp\_t* \*disp, uint16\_t num)

Pop (delete) the last ‘num’ invalidated areas from the buffer

### Parameters

- **num**: number of areas to delete

bool **lv\_disp\_is\_double\_buf**(*lv\_disp\_t* \*disp)

Check the driver configuration if it’s double buffered (both **buf1** and **buf2** are set)

**Return** true: double buffered; false: not double buffered

### Parameters

- **disp**: pointer to to display to check

bool **lv\_disp\_is\_true\_double\_buf**(*lv\_disp\_t* \*disp)

Check the driver configuration if it’s TRUE double buffered (both **buf1** and **buf2** are set and **size** is screen sized)

**Return** true: double buffered; false: not double buffered

### Parameters

- **disp**: pointer to to display to check

**struct lv\_disp\_buf\_t**

*#include <lv\_hal\_disp.h>* Structure for holding display buffer information.

### Public Members

void \***buf1**

First display buffer.

void \***buf2**

Second display buffer.

void \***buf\_act**

uint32\_t **size**

lv\_area\_t **area**

volatile uint32\_t **flushing**

**struct \_disp\_drv\_t**

*#include <lv\_hal\_disp.h>* Display Driver structure to be registered by HAL

## Public Members

`lv_coord_t` **hor\_res**  
Horizontal resolution.

`lv_coord_t` **ver\_res**  
Vertical resolution.

`lv_disp_buf_t` \***buffer**  
Pointer to a buffer initialized with `lv_disp_buf_init()`. LittlevGL will use this buffer(s) to draw the screens contents

`uint32_t` **antialiasing**  
1: antialiasing is enabled on this display.

`uint32_t` **rotated**  
1: turn the display by 90 degree.

**Warning** Does not update coordinates for you!

`uint32_t` **screen\_transp**  
Handle if the the screen doesn' t have a solid (`opa == LV_OPA_COVER`) background. Use only if required because it' s slower.

`void (*flush_cb)(struct __disp_drv_t *disp_drv, const lv_area_t *area, lv_color_t *color_p)`  
MANDATORY: Write the internal buffer (VDB) to the display. 'lv\_disp\_flush\_ready()' has to be called when finished

`void (*rounder_cb)(struct __disp_drv_t *disp_drv, lv_area_t *area)`  
OPTIONAL: Extend the invalidated areas to match with the display drivers requirements E.g. round y to, 8, 16 ..) on a monochrome display

`void (*set_px_cb)(struct __disp_drv_t *disp_drv, uint8_t *buf, lv_coord_t buf_w, lv_coord_t x, lv_coord_t y, lv_color_t color, lv_opa_t opa)`  
OPTIONAL: Set a pixel in a buffer according to the special requirements of the display Can be used for color format not supported in LittlevGL. E.g. 2 bit -> 4 gray scales

**Note** Much slower then drawing with supported color formats.

`void (*monitor_cb)(struct __disp_drv_t *disp_drv, uint32_t time, uint32_t px)`  
OPTIONAL: Called after every refresh cycle to tell the rendering and flushing time + the number of flushed pixels

`void (*gpu_blend_cb)(struct __disp_drv_t *disp_drv, lv_color_t *dest, const lv_color_t *src, uint32_t length, lv_opa_t opa)`  
OPTIONAL: Blend two memories using opacity (GPU only)

`void (*gpu_fill_cb)(struct __disp_drv_t *disp_drv, lv_color_t *dest_buf, lv_coord_t dest_width, const lv_area_t *fill_area, lv_color_t color)`  
OPTIONAL: Fill a memory with a color (GPU only)

`lv_color_t` **color\_chroma\_key**  
On CHROMA\_KEYED images this color will be transparent. `LV_COLOR TRANSP` by default. (lv\_conf.h)

`lv_disp_drv_user_data_t` **user\_data**  
Custom display driver user data

**struct \_\_disp\_t**  
`#include <lv_hal_disp.h>` Display structure. `lv_disp_drv_t` is the first member of the structure.

## Public Members

*lv\_disp\_drv\_t* **driver**  
 < Driver to the display A task which periodically checks the dirty areas and refreshes them

*lv\_task\_t* \***refr\_task**

*lv\_ll\_t* **scr\_ll**  
 Screens of the display

**struct** *lv\_obj\_t* \***act\_scr**  
 Currently active screen on this display

**struct** *lv\_obj\_t* \***top\_layer**  
 See *lv\_disp\_get\_layer\_top*

**struct** *lv\_obj\_t* \***sys\_layer**  
 See *lv\_disp\_get\_layer\_sys*

*lv\_area\_t* **inv\_areas**[LV\_INV\_BUF\_SIZE]  
 Invalidated (marked to redraw) areas

*uint8\_t* **inv\_area\_joined**[LV\_INV\_BUF\_SIZE]

*uint32\_t* **inv\_p**

*uint32\_t* **last\_activity\_time**  
 Last time there was activity on this display

## Interface de périphérique d' entrée

### Types de périphériques d' entrée

Pour configurer un périphérique d' entrée, une variable *lv\_indev\_drv\_t* doit être initialisée :

```
lv_indev_drv_t indev_drv;
lv_indev_drv_init(&indev_drv);           /* Initialisation de base */
indev_drv.type = ...                     /* Voir ci-dessous. */
indev_drv.read_cb = ...                  /* Voir ci-dessous. */
/* Enregistre le pilote dans LittlevGL et sauvegarde l'objet de périphérique d'entrée.
↳ créé */
lv_indev_t * my_indev = lv_indev_drv_register(&indev_drv);
```

type peut être

- **LV\_INDEV\_TYPE\_POINTER** pavé tactile ou souris
- **LV\_INDEV\_TYPE\_KEYPAD** clavier
- **LV\_INDEV\_TYPE\_ENCODER** encodeur avec options gauche, droite et appui
- **LV\_INDEV\_TYPE\_BUTTON** bouton externe

**read\_cb** est un pointeur sur une fonction qui sera appelée périodiquement pour indiquer l' état actuel d' un périphérique d' entrée. Les données peuvent être placées dans un tampon, la fonction retourne **false** lorsqu' il ne reste plus de données à lire ou **true** lorsque le tampon n' est pas vide.

Visitez *Périphériques d' entrée* pour en savoir plus sur les périphériques d' entrée en général.

## Pavé tactile, souris ou autre pointeur

Les périphériques d'entrée qui peuvent cliquer sur des points de l'écran appartiennent à cette catégorie.

```
indev_drv.type = LV_INDEV_TYPE_POINTER;
indev_drv.read_cb = my_input_read;

...

bool my_input_read(lv_indev_drv_t * drv, lv_indev_data_t*data)
{
    data->point.x = touchpad_x;
    data->point.y = touchpad_y;
    data->state = LV_INDEV_STATE_PR or LV_INDEV_STATE_REL;
    return false; /* Pas de tampon donc plus de données à lire */
}
```

**Important:** Les pilotes de pavé tactile doivent renvoyer les dernières coordonnées X/Y même lorsque l'état est `LV_INDEV_STATE_REL`.

Pour définir un curseur de souris, utilisez `lv_indev_set_cursor(my_indev, &img_cursor)` (`my_indev` est la valeur de retour de `lv_indev_drv_register`).

## Pavé numérique ou clavier

Les claviers complets avec toutes les lettres ou plus simples avec quelques boutons de navigation sont décrits ici.

Pour utiliser un clavier :

- Enregistrez une fonction `read_cb` avec le type `LV_INDEV_TYPE_KEYPAD`.
- Activez `LV_USE_GROUP` dans `lv_conf.h`
- Un groupe d'objets doit être créé : `lv_group_t * g = lv_group_create()` et des objets doivent y être ajoutés avec `lv_group_add_obj(g, obj)`
- Le groupe créé doit être affecté à un périphérique d'entrée : `lv_indev_set_group(my_indev, g)` (`my_indev` est la valeur de retour de `lv_indev_drv_register`)
- Utilisez `LV_KEY_...` pour naviguer parmi les objets du groupe. Voir `lv_core/lv_group.h` pour les touches disponibles.

```
indev_drv.type = LV_INDEV_TYPE_KEYPAD;
indev_drv.read_cb = my_input_read;

...

bool keyboard_read(lv_indev_drv_t * drv, lv_indev_data_t*data){
    data->key = last_key(); /* Obtient la dernière touche pressée ou ↵
↵ relâchée */

    if(key_pressed()) data->state = LV_INDEV_STATE_PR;
    else data->state = LV_INDEV_STATE_REL;
```

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```

    return false; /* Pas de tampon donc plus de données à lire */
}

```

## Encodeur

Avec un encodeur, vous pouvez réaliser 4 actions :

1. Appuyer son bouton
2. Appuyer longuement son bouton
3. Tourner à gauche
4. Tourner à droite

En bref, les encodeurs fonctionnent comme ceci :

- En tournant l' encodeur, vous pouvez sélectionner l' objet suivant/précédent.
- Lorsque vous appuyez sur l' encodeur sur un objet simple (comme un bouton), vous cliquez dessus.
- Si vous appuyez sur l' encodeur sur un objet complexe (comme une liste, une boîte de message, etc.), l' objet passera en mode édition. Vous pouvez alors naviguer dans l' objet en tournant l' encodeur.
- Pour quitter le mode édition, appuyez longuement sur le bouton.

Pour utiliser un *encodeur* (comme un *clavier*), des objets doivent être ajoutés aux groupes.

```

indev_drv.type = LV_INDEV_TYPE_ENCODER;
indev_drv.read_cb = my_input_read;

...

bool encoder_read(lv_indev_drv_t * drv, lv_indev_data_t*data){
    data->enc_diff = enc_get_new_moves();

    if(enc_pressed()) data->state = LV_INDEV_STATE_PR;
    else data->state = LV_INDEV_STATE_REL;

    return false; /* Pas de tampon donc plus de données à lire */
}

```

## Bouton

*Bouton* signifie bouton “matériel” externe à côté de l' écran, affecté à des coordonnées spécifiques de l' écran. Si un bouton est pressé, il simule l' appui sur la coordonnée attribuée (comme un pavé tactile)

Pour affecter des boutons aux coordonnées, utilisez `lv_indev_set_button_points(my_indev, points_array)`. `points_array` doit ressembler à `const lv_point_t points_array[] = { {12, 30}, {60, 90}, ... }`

---

**Important:** `points_array` ne peut être hors de portée. Déclarez-le en tant que variable globale ou en tant que variable statique dans une fonction.

---

```

indev_drv.type = LV_INDEV_TYPE_BUTTON;
indev_drv.read_cb = my_input_read;

...

bool button_read(lv_indev_drv_t * drv, lv_indev_data_t*data){
    static uint32_t last_btn = 0; /* Mémorise le dernier bouton pressé */
    int btn_pr = my_btn_read(); /* Obtient l'ID (0, 1, 2 ...) du bouton pressé */
    if(btn_pr >= 0) { /* Un bouton est-il pressé ? P.ex. -1 indique qu
↳ 'aucun bouton n'est pressé */
        last_btn = btn_pr; /* Sauvegarde l'ID du bouton pressé */
        data->state = LV_INDEV_STATE_PR; /* Définit l'état pressé */
    } else {
        data->state = LV_INDEV_STATE_REL; /* Définit l'état relâché */
    }

    data->btn = last_btn; /* Enregistre le dernier bouton */

    return false; /* Pas de tampon donc plus de données à lire */
}

```

## Autres fonctionnalités

Outre `read_cb`, une autre fonction de rappel `feedback_cb` peut également être spécifiée dans `lv_indev_drv_t`. `feedback_cb` est appelée lorsqu'un événement, quel qu'il soit, est envoyé par les périphériques d'entrée. (indépendamment de leur type). Cela permet de faire un retour à l'utilisateur, par exemple. jouer un son sur `LV_EVENT_CLICK`.

La valeur par défaut des paramètres suivants peut être définie dans `lv_conf.h` mais la valeur par défaut peut être surchargée dans `lv_indev_drv_t` :

- **drag\_limit** Nombre de pixels à parcourir avant de faire glisser l'objet
- **drag\_throw** Ralentissement du glissé après lâché en [%]. Une valeur haute signifie un ralentissement plus rapide
- **long\_press\_time** Temps d'appui avant de générer `LV_EVENT_LONG_PRESSED` (en millisecondes)
- **long\_press\_rep\_time** Intervalle de temps entre deux envois `LV_EVENT_LONG_PRESSED_REPEAT` (en millisecondes)
- **read\_task** pointeur sur l'objet `lv_task` qui lit le périphérique d'entrée. Ses paramètres peuvent être modifiés avec les fonctions `lv_task_...()`

Chaque périphérique d'entrée est associé à un affichage. Par défaut, un nouveau périphérique d'entrée est ajouté à l'affichage créé en dernier ou explicitement sélectionné (à l'aide de `lv_disp_set_default()`). L'affichage associé est sauvegardé et peut être modifié dans le champ `disp` du pilote.

## API

Input Device HAL interface layer header file

## Typedefs

```
typedef uint8_t lv_indev_type_t
```

**typedef** uint8\_t **lv\_indev\_state\_t**

**typedef struct** *lv\_indev\_drv\_t* **lv\_indev\_drv\_t**  
 Initialized by the user and registered by 'lv\_indev\_add()'

**typedef struct** *lv\_indev\_proc\_t* **lv\_indev\_proc\_t**  
 Run time data of input devices Internally used by the library, you should not need to touch it.

**typedef struct** *lv\_indev\_t* **lv\_indev\_t**  
 The main input device descriptor with driver, runtime data ( 'proc' ) and some additional information

## Enums

**enum** [anonymous]  
 Possible input device types

*Values:*

**LV\_INDEV\_TYPE\_NONE**  
 Uninitialized state

**LV\_INDEV\_TYPE\_POINTER**  
 Touch pad, mouse, external button

**LV\_INDEV\_TYPE\_KEYPAD**  
 Keypad or keyboard

**LV\_INDEV\_TYPE\_BUTTON**  
 External (hardware button) which is assigned to a specific point of the screen

**LV\_INDEV\_TYPE\_ENCODER**  
 Encoder with only Left, Right turn and a Button

**enum** [anonymous]  
 States for input devices

*Values:*

**LV\_INDEV\_STATE\_REL** = 0

**LV\_INDEV\_STATE\_PR**

## Functions

void **lv\_indev\_drv\_init**(*lv\_indev\_drv\_t* \*driver)  
 Initialize an input device driver with default values. It is used to surly have known values in the fields and not memory junk. After it you can set the fields.

**Parameters**

- **driver**: pointer to driver variable to initialize

*lv\_indev\_t* \***lv\_indev\_drv\_register**(*lv\_indev\_drv\_t* \*driver)  
 Register an initialized input device driver.

**Return** pointer to the new input device or NULL on error

**Parameters**

- **driver**: pointer to an initialized 'lv\_indev\_drv\_t' variable (can be local variable)

void **lv\_indev\_drv\_update**(*lv\_indev\_t* \*indev, *lv\_indev\_drv\_t* \*new\_drv)  
 Update the driver in run time.

### Parameters

- **indev**: pointer to a input device. (return value of `lv_indev_drv_register`)
- **new\_drv**: pointer to the new driver

*lv\_indev\_t* \***lv\_indev\_get\_next**(*lv\_indev\_t* \*indev)

Get the next input device.

**Return** the next input device or NULL if no more. Give the first input device when the parameter is NULL

### Parameters

- **indev**: pointer to the current input device. NULL to initialize.

bool **lv\_indev\_read**(*lv\_indev\_t* \*indev, *lv\_indev\_data\_t* \*data)

Read data from an input device.

**Return** false: no more data; true: there more data to read (buffered)

### Parameters

- **indev**: pointer to an input device
- **data**: input device will write its data here

**struct lv\_indev\_data\_t**

*#include <lv\_hal\_indev.h>* Data structure passed to an input driver to fill

### Public Members

*lv\_point\_t* **point**

For LV\_INDEV\_TYPE\_POINTER the currently pressed point

*uint32\_t* **key**

For LV\_INDEV\_TYPE\_KEYPAD the currently pressed key

*uint32\_t* **btn\_id**

For LV\_INDEV\_TYPE\_BUTTON the currently pressed button

*int16\_t* **enc\_diff**

For LV\_INDEV\_TYPE\_ENCODER number of steps since the previous read

*lv\_indev\_state\_t* **state**

LV\_INDEV\_STATE\_REL or LV\_INDEV\_STATE\_PR

**struct \_lv\_indev\_drv\_t**

*#include <lv\_hal\_indev.h>* Initialized by the user and registered by 'lv\_indev\_add()'

### Public Members

*lv\_indev\_type\_t* **type**

< Input device type Function pointer to read input device data. Return 'true' if there is more data to be read (buffered). Most drivers can safely return 'false'

bool (\***read\_cb**)(**struct \_lv\_indev\_drv\_t** \*indev\_drv, *lv\_indev\_data\_t* \*data)

void (\***feedback\_cb**)(**struct \_lv\_indev\_drv\_t** \*, *uint8\_t*)

Called when an action happened on the input device. The second parameter is the event from *lv\_event\_t*

*lv\_indev\_drv\_user\_data\_t* **user\_data**

**struct *\_disp\_t* \*disp**

< Pointer to the assigned display Task to read the periodically read the input device

*lv\_task\_t* \***read\_task**

Number of pixels to slide before actually drag the object

uint8\_t **drag\_limit**

Drag throw slow-down in [%]. Greater value means faster slow-down

uint8\_t **drag\_throw**

Long press time in milliseconds

uint16\_t **long\_press\_time**

Repeated trigger period in long press [ms]

uint16\_t **long\_press\_rep\_time**

**struct *\_lv\_indev\_proc\_t***

*#include <lv\_hal\_indev.h>* Run time data of input devices Internally used by the library, you should not need to touch it.

### Public Members

*lv\_indev\_state\_t* **state**

Current state of the input device.

*lv\_point\_t* **act\_point**

Current point of input device.

*lv\_point\_t* **last\_point**

Last point of input device.

*lv\_point\_t* **vect**

Difference between *act\_point* and *last\_point*.

*lv\_point\_t* **drag\_sum**

*lv\_point\_t* **drag\_throw\_vect**

**struct *\_lv\_obj\_t* \*act\_obj**

**struct *\_lv\_obj\_t* \*last\_obj**

**struct *\_lv\_obj\_t* \*last\_pressed**

uint8\_t **drag\_limit\_out**

uint8\_t **drag\_in\_prog**

**struct *\_lv\_indev\_proc\_t*::[anonymous]::[anonymous] pointer**

*lv\_indev\_state\_t* **last\_state**

uint32\_t **last\_key**

**struct *\_lv\_indev\_proc\_t*::[anonymous]::[anonymous] keypad**

**union *\_lv\_indev\_proc\_t*::[anonymous] types**

uint32\_t **pr\_timestamp**

Pressed time stamp

uint32\_t **longpr\_rep\_timestamp**

Long press repeat time stamp

```
uint8_t long_pr_sent
uint8_t reset_query
uint8_t disabled
uint8_t wait_until_release
```

### struct \_lv\_indev\_t

*#include <lv\_hal\_indev.h>* The main input device descriptor with driver, runtime data ( ‘proc’ ) and some additional information

#### Public Members

```
lv_indev_drv_t driver
lv_indev_proc_t proc
struct _lv_obj_t *cursor
    Cursor for LV_INPUT_TYPE_POINTER
struct _lv_group_t *group
    Keypad destination group
const lv_point_t *btn_points
    Array points assigned to the button ( )screen will be pressed here by the buttons
```

### Interface tic

The LittlevGL needs a system tick to know the elapsed time for animation and other tasks.

You need to call the `lv_tick_inc(tick_period)` function periodically and tell the call period in milliseconds. For example, `lv_tick_inc(1)` for calling in every millisecond.

`lv_tick_inc` should be called in a higher priority routine than `lv_task_handler()` (e.g. in an interrupt) to precisely know the elapsed milliseconds even if the execution of `lv_task_handler` takes longer time.

Sur FreeRTOS, `lv_tick_inc` peut être appelée dans `vApplicationTickHook`.

On Linux based operating system (e.g. on Raspberry Pi) `lv_tick_inc` can be called in a thread as below:

```
void * tick_thread (void *args)
{
    while(1) {
        usleep(5*1000); /* Dors pendant 5 millisecondes */
        lv_tick_inc(5); /* Indique à LittlevGL que 5 millisecondes se sont
        ↳écoulées */
    }
}
```

### API

Provide access to the system tick with 1 millisecond resolution

## Functions

`uint32_t lv_tick_get(void)`

Get the elapsed milliseconds since start up

**Return** the elapsed milliseconds

`uint32_t lv_tick_elaps(uint32_t prev_tick)`

Get the elapsed milliseconds since a previous time stamp

**Return** the elapsed milliseconds since ‘prev\_tick’

**Parameters**

- `prev_tick`: a previous time stamp (return value of `systick_get()` )

## Gestionnaire de tâche

Pour gérer les tâches de LittlevGL, vous devez appeler `lv_task_handler()` régulièrement à partir d’ un des éléments suivants :

- boucle `while(1)` de la fonction `main()`
- interruption périodique d’ une horloge (priorité plus basse que `lv_tick_inc()`)
- une tâche périodique du SE

Le délai n’ est pas critique, mais il faut environ 5 millisecondes pour que le système reste réactif.

Exemple :

```
while(1) {
    lv_task_handler();
    my_delay_ms(5);
}
```

Pour en savoir plus sur les tâches, visitez la section *Tâches*.

## Gestion du sommeil

Le microcontrôleur peut s’ endormir lorsque aucune intervention de l’ utilisateur n’ est effectuée. Dans ce cas, la boucle principale `while (1)` devrait ressembler à ceci :

```
while(1) {
    /* Fonctionnement normal (pas de sommeil) si moins de 1 seconde d'inactivité */
    if(lv_disp_get_inactive_time(NULL) < 1000) {
        lv_task_handler();
    }
    /* Sommeil après une seconde d'inactivité */
    else {
        timer_stop(); /* Arrêt de l'horloge où lv_tick_inc() est appelée */
        sleep();      /* Place le microcontrôleur en sommeil */
    }
    my_delay_ms(5);
}
```

Vous devez également ajouter ces lignes à la fonction de lecture de votre périphérique d’ entrée si un appui est effectué :

```
lv_tick_inc(LV_DISP_DEF_REFR_PERIOD); /* Force l'exécution de la tâche au réveil */
timer_start();                       /* Redémarre l'horloge où lv_tick_inc() est
↳ appelée */
lv_task_handler();                   /* Appelle `lv_task_handler()` manuellement
↳ pour traiter le réveil */
```

En plus de `lv_disp_get_inactive_time()`, vous pouvez vérifier `lv_anim_count_running()` pour voir si toutes les animations sont terminées.

## Système d' exploitation et interruptions

LittlevGL n' est **pas compatible avec les fils d' exécution** par défaut.

Cependant, dans les cas suivants, il est valide d' appeler des fonctions liées à LittlevGL :

- Dans les *événements*. Apprenez-en plus dans *Événements*.
- Dans *lv\_tasks*. Apprenez-en plus dans *Tâches*.

## Tâches et fils d' exécution

Si vous avez besoin d' utiliser de vraies tâches ou des fils d' exécution, vous avez besoin d' un mutex qui doit être acquis avant l' appel de `lv_task_handler` et libéré ensuite. Par ailleurs, vous devez utiliser ce même mutex dans les autres tâches et fils d' exécution lors de chaque appel de fonction et code liés à LittlevGL (`lv_...`). De cette façon, vous pouvez utiliser LittlevGL dans un environnement réellement multitâche. Utilisez simplement un mutex pour éviter l' appel concurrent des fonctions LittlevGL.

## Interruptions

Essayez d' éviter d' appeler les fonctions LittlevGL à partir d' une interruption (sauf `lv_tick_inc()` et `lv_disp_flush_ready()`). Mais si vous avez besoin de le faire, vous devez désactiver l' interruption qui utilise les fonctions LittlevGL pendant que `lv_task_handler` est en cours d' exécution. Il est préférable de positionner un indicateur ou une valeur et de le vérifier périodiquement dans une `lv_task`.

## Journalisation

LittlevGL a un module *journal* intégré pour informer l' utilisateur de ce qui se passe dans la librairie.

## Niveau de détail

Pour activer la journalisation, définissez `LV_USE_LOG 1` dans *lv\_conf.h* et définissez `LV_LOG_LEVEL` sur l' une des valeurs suivantes :

- `LV_LOG_LEVEL_TRACE` Beaucoup de messages pour donner des informations détaillées
- `LV_LOG_LEVEL_INFO` Consigne les événements importants
- `LV_LOG_LEVEL_WARN` Journalise si quelque chose d' inattendu s' est produit mais n' a pas causé de problème
- `LV_LOG_LEVEL_ERROR` Uniquement les problèmes critiques, lorsque le système peut planter
- `LV_LOG_LEVEL_NONE` Ne journalise rien



Les événements dont le niveau est supérieur au niveau de journalisation défini seront également consignés. Par exemple si vous activez `LV_LOG_LEVEL_WARN`, les *erreurs* seront également consignées.

### Journalisation avec printf

Si votre système prend en charge `printf`, il vous suffit d' activer `LV_LOG_PRINTF` dans *lv\_conf.h* pour traiter les journaux avec `printf`.

### Fonction de journalisation personnalisée

Si vous ne pouvez pas utiliser `printf` ou si vous souhaitez utiliser une fonction personnalisée pour journaliser, vous pouvez enregistrer une fonction de rappel “journaliseur” avec `lv_log_register_print_cb()` .

Par exemple :

```
void my_log_cb(lv_log_level_t level, const char * file, int line, const char * dsc)
{
    /* Envoie les messages via le port série */
    if(level == LV_LOG_LEVEL_ERROR) serial_send("ERROR: ");
    if(level == LV_LOG_LEVEL_WARN)  serial_send("WARNING: ");
    if(level == LV_LOG_LEVEL_INFO)  serial_send("INFO: ");
    if(level == LV_LOG_LEVEL_TRACE) serial_send("TRACE: ");

    serial_send("File: ");
    serial_send(file);

    char line_str[8];
    sprintf(line_str, "%d", line);
    serial_send("#");
    serial_send(line_str);

    serial_send(": ");
    serial_send(dsc);
    serial_send("\n");
}

...

lv_log_register_print_cb(my_log_cb);
```

### Ajouter des messages

Vous pouvez également utiliser le module de journalisation via les fonctions `LV_LOG_TRACE/INFO/WARN/ERROR(description)`.

## 3.16.3 Vue d’ ensemble

### Objets

Dans LittlevGL, les **éléments de base** d’ une interface utilisateur sont les objets, également appelés *éléments visuels*. Par exemple, un *Bouton*, une *Etiquette*, une *Image*, une *Liste*, un *Graphique* ou une *Zone de texte*.

Découvrez tous les *Types d’ objet* ici.

## Attributs d' objet

### Attributs de base

Tous les types d' objet partagent certains attributs de base :

- Position
- Taille
- Parent
- Autorisation du glissé
- Autorisation du clic etc.

Vous pouvez définir/obtenir ces attributs avec les fonctions `lv_obj_set _...` et `lv_obj_get _....`.  
Par exemple :

```
/* Définit les attributs de base de l'objet */
lv_obj_set_size(btn1, 100, 50);           /* Taille du bouton */
lv_obj_set_pos(btn1, 20,30);             /* Position du bouton */
```

Pour voir toutes les fonctions disponibles, visitez la [documentation](#) de l' objet de base.

### Attributs spécifiques

Les types d' objet ont aussi des attributs spéciaux. Par exemple, un curseur a

- Des valeurs minimum et maximum
- Une valeur courante
- Des styles personnalisés

Pour ces attributs, chaque type d' objet possède des fonctions API uniques. Par exemple pour un curseur :

```
/* Définit les attributs spécifiques du curseur */
lv_slider_set_range(slider1, 0, 100);      /* Définit les valeurs minimum et ↵
↵ maximum */
lv_slider_set_value(slider1, 40, LV_ANIM_ON); /* Définit la valeur courante ↵
↵ (position) */
lv_slider_set_action(slider1, my_action); /* Définit une fonction de rappel */
```

Les API des types d' objet sont décrites dans leur [Documentation](#) mais vous pouvez également consulter les fichiers d' en-tête respectifs (p.ex. `lv_objx/lv_slider.h`).

## Mécanismes de fonctionnement de l' objet

### Structure parent-enfant

Un objet parent peut être considéré comme le conteneur de ses enfants. Chaque objet a exactement un objet parent (à l' exception des écrans), mais un parent peut avoir un nombre illimité d' enfants. Il n' y a pas de contrainte pour le type du parent, mais il existe des objets parent typiques (par exemple un bouton) et enfants (par exemple une étiquette).

## Se déplacer ensemble

Si la position du parent est modifiée, les enfants se déplaceront avec lui. Par conséquent, toutes les positions sont relatives au parent.

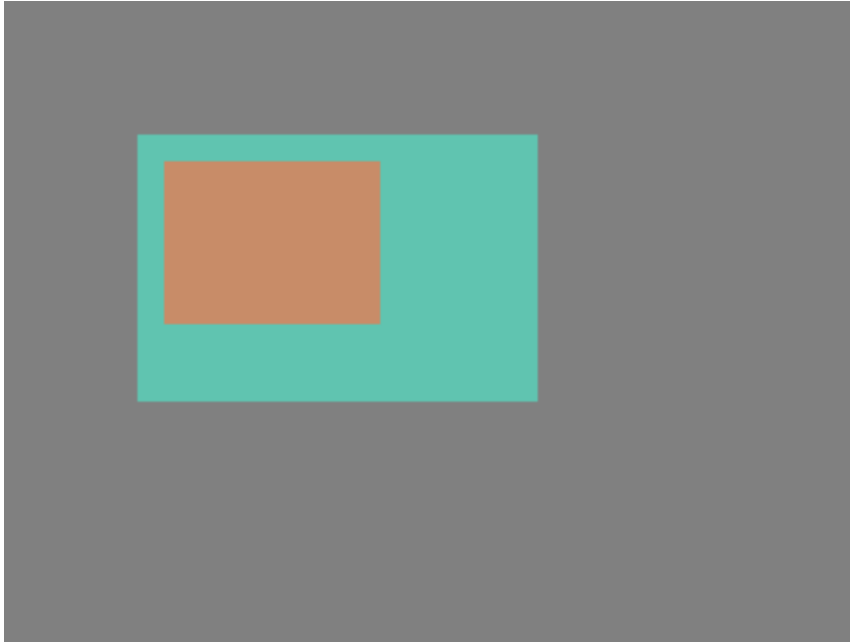
Les coordonnées (0, 0) signifient que les objets resteront dans le coin supérieur gauche du parent indépendamment de la position du parent.



```
lv_obj_t * par = lv_obj_create(lv_scr_act(), NULL); /* Crée un objet parent sur l
↳ 'écran actuel */
lv_obj_set_size(par, 100, 80);                      /* Définit la taille du
↳ parent */

lv_obj_t * obj1 = lv_obj_create(par, NULL);           /* Crée un objet sur l
↳ 'objet parent créé précédemment */
lv_obj_set_pos(obj1, 10, 10);                        /* Définit la position du
↳ nouvel objet */
```

Modifiez la position du parent :



```
lv_obj_set_pos(par, 50, 50);           /* Déplacez le parent. L'enfant va bouger avec. */
```

Pour simplifier, la définition des couleurs des objets n' est pas montrée dans l' exemple.

### Visibilité uniquement sur le parent

Si un enfant est partiellement ou complètement hors de son parent, les parties extérieures ne seront pas visibles.



```
lv_obj_set_x(obj1, -30);                /* Déplace l'enfant en partie en dehors du parent */
```

## Créer - supprimer des objets

Dans LittlevGL, les objets peuvent être créés et supprimés dynamiquement à l’ exécution. Cela signifie que seuls les objets actuellement créés consomment de la MEV. Par exemple, si vous avez besoin d’ un graphique, vous pouvez le créer à l’ utilisation et le supprimer s’ il n’ est pas visible ou plus nécessaire.

Chaque type d’ objet a sa propre fonction **create** avec une signature unifiée. Deux paramètres sont nécessaires :

- un pointeur sur l’ objet parent. Pour créer un écran, donnez *NULL* comme parent.
- éventuellement un pointeur sur un autre objet du même type pour copie. Peut être *NULL* pour ne pas copier un autre objet.

Tous les objets sont référencés dans le code C en utilisant un pointeur `lv_obj_t`. Ce pointeur peut ensuite être utilisé pour définir ou obtenir les attributs de l’ objet.

Les fonctions de création ressemblent à ceci :

```
lv_obj_t * lv_<type>_create(lv_obj_t * parent, lv_obj_t * copy);
```

Il existe une fonction commune de **suppression** pour tous les types d’ objet. Il supprime l’ objet et tous ses enfants.

```
void lv_obj_del(lv_obj_t * obj);
```

`lv_obj_del` supprimera immédiatement l’ objet. Si pour une quelconque raison vous ne pouvez pas supprimer l’ objet immédiatement, vous pouvez utiliser `lv_obj_del_async(obj)`. Utile, par exemple si vous voulez supprimer le parent d’ un objet dans le traitement de l’ événement `LV_EVENT_DELETE`.

Vous pouvez supprimer tous les enfants d’ un objet (mais pas l’ objet lui-même) en utilisant `lv_obj_clean` :

```
void lv_obj_clean(lv_obj_t * obj);
```

## Ecran - le parent le plus élémentaire

Les écrans sont des objets spéciaux qui n’ ont pas d’ objet parent. Il est donc créé ainsi :

```
lv_obj_t * scr1 = lv_obj_create(NULL, NULL);
```

Il y a toujours un écran actif sur chaque affichage. Par défaut, la librairie crée et charge un “objet de base” comme écran pour chaque affichage. Pour obtenir l’ écran actuellement actif, utilisez la fonction `lv_scr_act()`. Pour en charger un nouveau, utilisez `lv_scr_load(scr1)`.

Les écrans peuvent être créés avec n’ importe quel type d’ objet. Par exemple, un *Objet de base* ou une image pour créer un fond d’ écran.

Les écrans sont créés sur l’ *affichage par défaut* actuellement sélectionné. L’ écran *par défaut* est le dernier écran enregistré avec `lv_disp_drv_register` ou vous pouvez explicitement sélectionner un nouvel affichage par défaut avec `lv_disp_set_default (disp)`. `lv_scr_act()` et `lv_scr_load()` opèrent sur l’ écran courant par défaut.

Visitez [Support multi-affichage](#) pour en savoir plus.

## Couches

### Ordre de création

By default, LittlevGL draws old objects on the background and new objects on the foreground.

For example, assume we added a button to a parent object named button1 and then another button named button2. Then button1 (with its child object(s)) will be in the background and can be covered by button2 and its children.



```
/* Crée un écran */
lv_obj_t * scr = lv_obj_create(NULL, NULL);
lv_scr_load(scr);          /* Charge l'écran */

/* Crée 2 boutons */
lv_obj_t * btn1 = lv_btn_create(scr, NULL);          /* Crée un bouton sur l'écran */
lv_btn_set_fit(btn1, true, true);                    /* Permet de définir
↳ automatiquement la taille en fonction du contenu */
lv_obj_set_pos(btn1, 60, 40);                        /* Définit la position du
↳ bouton */

lv_obj_t * btn2 = lv_btn_create(scr, btn1);           /* Copie le premier bouton */
lv_obj_set_pos(btn2, 180, 80);                       /* Définit la position du bouton */

/* Ajoute des étiquettes aux boutons */
lv_obj_t * label1 = lv_label_create(btn1, NULL);     /* Crée une étiquette sur le
↳ premier bouton */
lv_label_set_text(label1, "Button 1");               /* Définit le texte de l
↳ étiquette */

lv_obj_t * label2 = lv_label_create(btn2, NULL);     /* Crée une étiquette sur
↳ le deuxième bouton */
lv_label_set_text(label2, "Button 2");               /* Définit le texte de l
↳ étiquette */
```

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```
/* Supprime la deuxième étiquette */
lv_obj_del(label2);
```

## Amener au premier plan

Il y a plusieurs façons d' amener un objet au premier plan :

- Use `lv_obj_set_top(obj, true)`. If `obj` or any of its children is clicked, then LittlevGL will automatically bring the object to the foreground. It works similarly to a typical GUI on a PC. When a window in the background is clicked, it will come to the foreground automatically.
- Use `lv_obj_move_foreground(obj)` to explicitly tell the library to bring an object to the foreground. Similarly, use `lv_obj_move_background(obj)` to move to the background.
- When `lv_obj_set_parent(obj, new_parent)` is used, `obj` will be on the foreground on the `new_parent`.

## Top and sys layers

LittlevGL uses two special layers named as `layer_top` and `layer_sys`. Both are visible and common on all screens of a display. **They are not, however, shared among multiple physical displays.** The `layer_top` is always on top of the default screen (`lv_scr_act()`), and `layer_sys` is on top of `layer_top`.

The `layer_top` can be used by the user to create some content visible everywhere. For example, a menu bar, a pop-up, etc. If the `click` attribute is enabled, then `layer_top` will absorb all user click and acts as a modal.

```
lv_obj_set_click(lv_layer_top(), true);
```

The `layer_sys` is also using for similar purpose on LittlevGL. For example, it places the mouse cursor there to be sure it's always visible.

## Événements

Les événements sont déclenchés dans LittlevGL quand il se produit quelque chose d' intéressant pour l' utilisateur, par exemple si un objet :

- est cliqué
- est déplacé
- sa valeur a changé, etc.

L' utilisateur peut affecter une fonction de rappel à un objet pour voir ces événements. En pratique, cela ressemble à ceci :

```
lv_obj_t * btn = lv_btn_create(lv_scr_act(), NULL);
lv_obj_set_event_cb(btn, my_event_cb); /* Assigne une fonction de rappel */

...

static void my_event_cb(lv_obj_t * obj, lv_event_t event)
{
```

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```

switch(event) {
    case LV_EVENT_PRESSED:
        printf("Pressed\n");
        break;

    case LV_EVENT_SHORT_CLICKED:
        printf("Short clicked\n");
        break;

    case LV_EVENT_CLICKED:
        printf("Clicked\n");
        break;

    case LV_EVENT_LONG_PRESSED:
        printf("Long press\n");
        break;

    case LV_EVENT_LONG_PRESSED_REPEAT:
        printf("Long press repeat\n");
        break;

    case LV_EVENT_RELEASED:
        printf("Released\n");
        break;
}

/* Etc. */
}

```

Plusieurs objets peuvent utiliser la même *fonction de rappel*.

## Types d' événements

Les types d' événements suivants existent :

### Événements génériques

Tous les objets (tels que boutons/étiquettes/curseurs etc.) reçoivent ces événements génériques quel que soit leur type.

### Relatifs aux périphériques d' entrée

Ils sont envoyés lorsqu' un objet est pressé/relâché etc. par l' utilisateur. Ils sont utilisés pour les périphériques d' entrée *clavier*, *encodeur* et *bouton*, ainsi que pour les *pointeurs*. Consultez la section *Périphériques d' entrée* pour en savoir plus à leur sujet.

- **LV\_EVENT\_PRESSED** L' objet a été pressé
- **LV\_EVENT\_PRESSING** L' objet est pressé(envoyé continuellement pendant l' appui)
- **LV\_EVENT\_PRESS\_LOST** Le périphérique d' entrée est toujours pressé mais hors de l' objet
- **LV\_EVENT\_SHORT\_CLICKED** Relâché avant un délai **LV\_INDEV\_LONG\_PRESS\_TIME**. Pas généré si l' objet est déplacé.



- **LV\_EVENT\_LONG\_PRESSED** Pressé durant **LV\_INDEV\_LONG\_PRESS\_TIME**. Pas généré si l' objet est déplacé.
- **LV\_EVENT\_LONG\_PRESSED\_REPEAT** Généré après **LV\_INDEV\_LONG\_PRESS\_TIME** à chaque **LV\_INDEV\_LONG\_PRESS\_REP\_TIME** ms. Pas généré si l' objet est déplacé.
- **LV\_EVENT\_CLICKED** Généré au relâché si l' objet n' est pas déplacé (indépendamment d' un appui long)
- **LV\_EVENT\_RELEASED** Généré dans tous les cas lorsque l' objet a été relâché, même s' il a été déplacé. Non généré si il y a eu déplacement pendant l' appui et si le relâché intervient en dehors de l' objet. Dans ce cas, **LV\_EVENT\_PRESS\_LOST** est généré.

### Relatif au pointeur

Ces événements sont envoyés uniquement par des périphériques d' entrée de type pointeur (p.ex. souris ou pavé tactile).

- **LV\_EVENT\_DRAG\_BEGIN** le glissé de l' objet a débuté,
- **LV\_EVENT\_DRAG\_END** le glissé de l' objet est terminé (lancé inclus),
- **LV\_EVENT\_DRAG\_THROW\_BEGIN** le lancé de l' objet a débuté (généré après un glissé avec “élan” )

### Relatif au pavé numérique et encodeur

Ces événements sont envoyés par les périphériques d' entrée clavier et encodeur. En savoir plus sur les *groupes* dans la section [Périphériques d' entrée] (overview/indev).

- **LV\_EVENT\_KEY** Une *touche* est envoyée à l' objet. Typiquement quand elle a été pressée ou répétée après un appui long
- **LV\_EVENT\_FOCUSED** L' objet est activé dans son groupe
- **LV\_EVENT\_DEFOCUSED** L' objet est désactivé dans son groupe

### Événements généraux

Autres événements généraux envoyés par la librairie.

- **LV\_EVENT\_DELETE** L' objet est en cours de suppression. Libérez les données associées allouées par l' utilisateur.

### Événements spéciaux

Ces événements sont spécifiques à un type particulier d' objet.

- **LV\_EVENT\_VALUE\_CHANGED** La valeur de l' objet a changé (p.ex. pour un *Curseur*)
- **LV\_EVENT\_INSERT** Quelque chose est inséré dans l' objet (typiquement à une *Zone de texte*)
- **LV\_EVENT\_APPLY** “Ok” , “Appliquer” ou un bouton spécifique similaire a été cliqué (typiquement à partir d' un objet *Clavier*)
- **LV\_EVENT\_CANCEL** “Fermer” , “Annuler” ou un bouton spécifique similaire a été cliqué (typiquement à partir d' un objet *Clavier*)

- **LV\_EVENT\_REFRESH** Demande à actualiser l' objet. Jamais généré par la lirbarie mais peut l' être par l' utilisateur.

Visitez la documentation spécifique à partir de *Types d' objet* pour comprendre quels événements sont utilisés par un type d' objet.

### Données personnalisées

Certains événements peuvent comporter des données personnalisées. Par exemple, **LV\_EVENT\_VALUE\_CHANGED** indique dans certains cas la nouvelle valeur. Pour plus d' informations, voir la documentation des *Types d' objet*. Pour obtenir les données personnalisées dans la fonction de rappel, utilisez `lv_event_get_data()`.

Le type des données personnalisées dépend de l' objet, mais si c' est un

- entier alors c' est un `uint32_t *` ou un `int32_t *`
- texte alors c' est un `char *` ou un `const char *`

### Envoyer des événements manuellement

Pour envoyer manuellement des événements à un objet, utilisez `lv_event_send(obj, LV_EVENT_..., &custom_data)`.

Par exemple, cela peut être utilisé pour fermer manuellement une boîte de message en simulant un appui sur un bouton, bien qu' il existe des manières plus simples de faire cela :

```
/* Simuler l'appui du premier bouton (les index partent de zéro) */
uint32_t btn_id = 0;
lv_event_send(mbox, LV_EVENT_VALUE_CHANGED, &btn_id);
```

Ou pour effectuer une actualisation générique :

```
lv_event_send(label, LV_EVENT_REFRESH, NULL);
```

### Styles

Les *styles* sont utilisés pour définir l' apparence des objets. Un style est une structure avec des attributs tels que couleurs, marges, opacité, police, etc.

Il existe un type de style commun nommé `lv_style_t` pour chaque type d' objet.

En définissant les champs des variables `lv_style_t` et en les affectant aux objets avec `lv_obj_set_style`, vous pouvez modifier l' apparence des objets.

---

**Important:** Les objets mémorisent uniquement un pointeur vers un style, de ce fait le style ne peut donc pas être une variable locale détruite après la sortie de la fonction. **Vous devez utiliser des variables statiques, globales ou allouées dynamiquement.**

---

```
/* Portée sur le fichier */
lv_style_t style_1;           /* OK ! Les variables globales pour les styles sont_
↪adaptées */
static lv_style_t style_2;     /* OK ! Les variables statiques en dehors des_
↪fonctions sont adaptées */
```

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```
void my_screen_create(void)
{
    /* Portée sur la fonction */
    static lv_style_t style_3;    /* OK ! Les variables statiques dans les fonctions
    ↪ sont adaptées */
    lv_style_t style_4;          /* Non ! Les styles ne peuvent pas être des variables
    ↪ locales */

    ...
}
```

## Utiliser les styles

Les objets ont un *style principal* qui détermine l'apparence de leur arrière-plan ou de leur partie principale. Cependant, certains types d'objet ont aussi des styles supplémentaires.

Par exemple, un curseur a 3 styles :

- Arrière-plan (style principal)
- Indicateur
- Bouton

Certains types d'objet ont un seul style. Par exemple :

- Etiquette
- Image
- Ligne, etc.

Chaque type d'objet implémente ses propres fonctions de gestion des styles. Vous devez les utiliser à la place de `lv_obj_set_style` quand c'est possible. Par exemple :

```
const lv_style_t * btn_style = lv_btn_get_style(btn, LV_BTN_STYLE_REL);
lv_btn_set_style(btn, LV_BTN_STYLE_REL, &new_style);
```

Pour voir les styles pris en charge par un type d'objet (`LV_<OBJ_TYPE>STYLE<STYLE_TYPE>`) vérifier la documentation du *Type d'objet* particulier.

Si vous **modifiez un style déjà utilisé** par un ou plusieurs objets, les objets doivent être avertis du changement de style. Il y a deux possibilités pour le faire :

```
/* Notifie un objet que son style est modifié */
void lv_obj_refresh_style(lv_obj_t * obj);

/* Notifie tous les objets avec un style donné (NULL pour notifier tous les objets) */
void lv_obj_report_style_mod(void * style);
```

`lv_obj_report_style_mod` will only refresh the *Main styles* of objects. If you change a different style, you will have to use `lv_obj_refresh_style`.

## Héritage de styles

Si le *style principal* d'un objet est `NULL`, son style sera hérité du style de son parent. Cela facilite la création d'une interface cohérente. N'oubliez pas qu'un style décrit beaucoup de propriétés en même

temps. Ainsi, par exemple, si vous définissez le style d' un bouton et créez une étiquette avec le style **NULL**, l' étiquette sera rendue en fonction du style du bouton. En d' autres termes, le bouton garantit à ses enfants une apparence correcte.

Setting the **glass** style property will prevent inheriting that style (i.e. cause the child object to inherit its style from its grandparent). You should use it if the style is transparent so children use colors and features from its grandparent. Otherwise, the child objects would also be transparent.

## Propriétés de style

Un style comporte 5 parties principales : commun, corps, texte, image et ligne. Chaque type d' objet utilise les champs qui le concernent. Par exemple, les *lignes* ne se soucient pas de *letter\_space*, car elles ne sont pas concernées par le rendu de texte.

Pour voir quels champs sont utilisés par un type d' objet, voir la documentation des *Types d' objet*.

Les champs d' une structure de style sont les suivants :

## Propriétés communes

- **glass** 1: Ne pas hériter de ce style

## Propriétés de style de corps

Utilisé par les objets rectangulaires

- **body.main\_color** Couleur principale (couleur du haut)
- **body.grad\_color** Dégradé de couleur (couleur de fond)
- **body.radius** Rayon pour arrondir les angles (**LV\_RADIUS\_CIRCLE** pour dessiner un cercle)
- **body.opa** Opacité (0..255 ou **LV\_OPA\_TRANSP**, **LV\_OPA\_10**, **LV\_OPA\_20** ... **LV\_OPA\_COVER**)
- **body.border.color** Couleur de bord
- **body.border.width** Largeur de bord
- **body.border.part** Segments de bord (**LV\_BORDER\_LEFT/RIGHT/TOP/BOTTOM/FULL** ou 'OR' de plusieurs valeurs)
- **body.border.opa** Opacité du bord (0..255 ou **LV\_OPA\_TRANSP**, **LV\_OPA\_10**, **LV\_OPA\_20** ... **LV\_OPA\_COVER**)
- **body.shadow.color** Couleur de l' ombre
- **body.shadow.width** Largeur de l' ombre
- **body.shadow.type** Type d' ombre (**LV\_SHADOW\_BOTTOM/FULL**)
- **body.padding.top** Marge haute
- **body.padding.bottom** Marge basse
- **body.padding.left** Marge gauche
- **body.padding.right** Marge droite
- **body.padding.inner** Marge intérieure (entre les éléments constitutifs ou les enfants)

## Propriétés de style de texte

Utilisés par les objets qui affichent du texte

- **text.color** Couleur de texte
- **text.sel\_color** Couleur de texte sélectionné
- **text.font** Pointeur vers une police
- **text.opa** Opacité du texte (0..255 ou LV\_OPA\_TRANSP, LV\_OPA\_10, LV\_OPA\_20 ... LV\_OPA\_COVER\*)
- **text.letter\_space** Espace de lettre
- **text.line\_space** Espace de ligne

## Propriétés de style d' image

Utilisé par les objets de type image ou les icônes sur les objets

- **image.color** Couleur pour la re-coloration de l' image en fonction de la luminosité des pixels
- **image.intense** Intensité de re-coloration (0..255 ou LV\_OPA\_TRANSP, LV\_OPA\_10, LV\_OPA\_20 ... LV\_OPA\_COVER)
- **image.opa** Opacité de l' image (0..255 ou LV\_OPA\_TRANSP, LV\_OPA\_10, LV\_OPA\_20 ... LV\_OPA\_COVER)

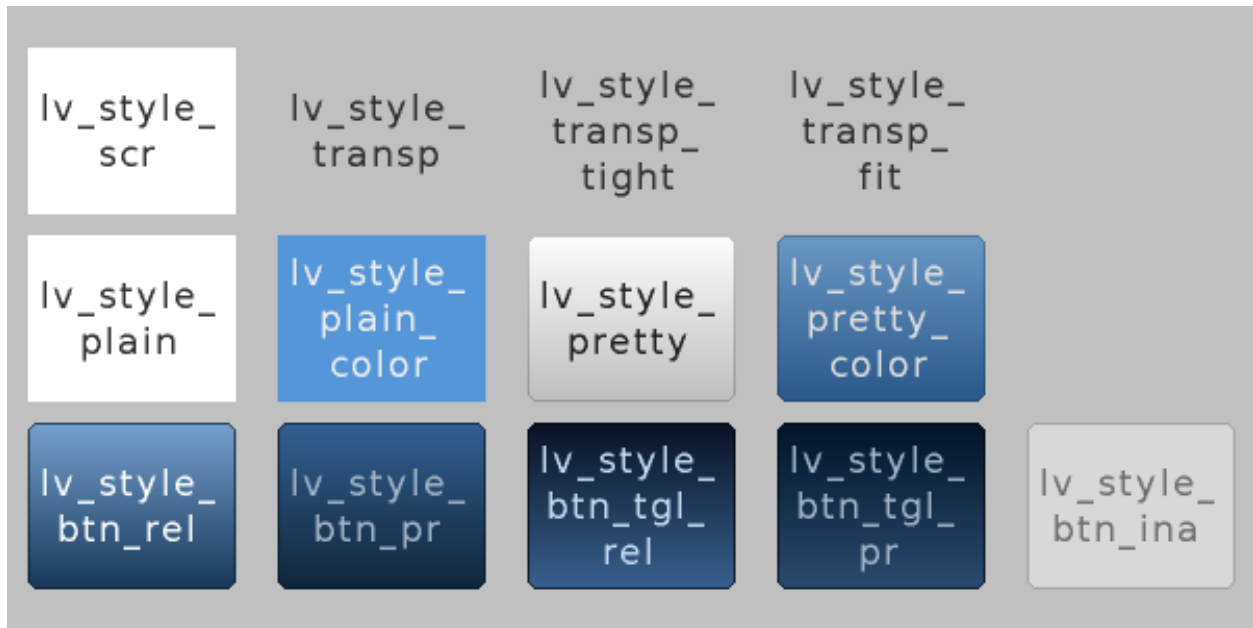
## Propriétés de style de ligne

Utilisé par des objets contenant des lignes ou des éléments de type ligne

- **line.color** Couleur de ligne
- **line.width** Largeur de ligne
- **line.opa** Opacité de ligne (0..255 or LV\_OPA\_TRANSP, LV\_OPA\_10, LV\_OPA\_20 ... LV\_OPA\_COVER)

## Styles intégrés

Il existe plusieurs styles intégrés dans la librairie :



Comme vous pouvez le constater, il y a des styles intégrés pour les écrans, les boutons, et les conteneurs opaques ou transparents.

Les styles `lv_style_transp`, `lv_style_transp_fit` et `lv_style_transp_tight` diffèrent uniquement par les marges : pour `lv_style_transp_tight` les marges sont nulles, pour `lv_style_transp_fit` seules les marges horizontales et verticales sont nulles mais il y a une marge intérieure.

**Important:** Les styles intégrés transparents ont *glass* = 1 par défaut, ce qui signifie que ces styles (les couleurs, par exemple) ne seront pas hérités par les enfants.

Les styles intégrés sont des variables globales `lv_style_t`. Vous pouvez les utiliser ainsi :

```
lv_btn_set_style(obj, LV_BTN_STYLE_REL, &lv_style_btn_rel)
```

### Créer de nouveaux styles

Vous pouvez modifier les styles intégrés ou en créer de nouveaux.

Lors de la création de nouveaux styles, il est recommandé de copier d'abord un style intégré avec `lv_style_copy(&dest_style, &src_style)` pour s'assurer que tous les champs sont initialisés avec une valeur appropriée.

N'oubliez pas d'initialiser le nouveau style comme **statique** ou **global**. Par exemple :

```
static lv_style_t my_red_style;
lv_style_copy(&my_red_style, &lv_style_plain);
my_red_style.body.main_color = LV_COLOR_RED;
my_red_style.body.grad_color = LV_COLOR_RED;
```

## Animations de style

You can change the styles with animations using `lv_style_anim_...()` function. The `lv_style_anim_set_styles()` uses 3 styles. Two styles are required to represent the *start* and *end* state, and a third style required for the *animation*.

Here is an example to show how it works.

```
lv_anim_t a;
lv_style_anim_init(&a);                                /*
↳Initialisation de base */
lv_style_anim_set_styles(&a, &style_to_anim, &style_start, &style_end); /* Définit
↳les styles à utiliser */
lv_style_anim_set_time(&a, duration, delay);           /* Définit la
↳durée et le délai */
lv_style_anim_create(&a);                               /* Crée l
↳animation */
```

Essentially, `style_start` and `style_end` remain unchanged, and `style_to_anim` is interpolated over the course of the animation.

See `lv_core/lv_style.h` to know the whole API of style animations.

Check *Animations* for more information.

## Exemple de style

L' exemple ci-dessous illustre l' utilisation des styles.



```
/* Crée un style */
static lv_style_t style1;
lv_style_copy(&style1, &lv_style_plain); /* Copie un style intégré pour
↳initialiser le nouveau style */
style1.body.main_color = LV_COLOR_WHITE;
style1.body.grad_color = LV_COLOR_BLUE;
style1.body.radius = 10;
style1.body.border.color = LV_COLOR_GRAY;
style1.body.border.width = 2;
style1.body.border.opa = LV_OPA_50;
style1.body.padding.left = 5; /* Marge horizontale, utilisée par l
↳indicateur de barre ci-dessous */
style1.body.padding.right = 5;
style1.body.padding.top = 5; /* Marge verticale, utilisée par l'indicateur
↳de barre ci-dessous */
```

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```

style1.body.padding.bottom = 5;
style1.text.color = LV_COLOR_RED;

/* Crée un simple objet */
lv_obj_t *obj1 = lv_obj_create(lv_scr_act(), NULL);
lv_obj_set_style(obj1, &style1);          /* Applique le style créé */
lv_obj_set_pos(obj1, 20, 20);             /* Définit la position */

/* Crée une étiquette sur l'objet. Le style de l'étiquette est NULL par défaut */
lv_obj_t *label = lv_label_create(obj1, NULL);
lv_obj_align(label, NULL, LV_ALIGN_CENTER, 0, 0);    /* Aligne l'étiquette au
↪milieu */

/* Crée une barre */
lv_obj_t *bar1 = lv_bar_create(lv_scr_act(), NULL);
lv_bar_set_style(bar1, LV_BAR_STYLE_INDIC, &style1); /* Modifie le style de l
↪'indicateur */
lv_bar_set_value(bar1, 70);                 /* Définit la valeur de la
↪barre */

```

## Thèmes

Creating styles for the GUI is challenging because you need a deeper understanding of the library, and you need to have some design skills. Also, it takes a lot of time to create so many styles for many different objects.

Themes are introduced to speed up the design part. A theme is a style collection which contains the required styles for every object type. For example, 5 styles for a button to describe its 5 possible states. Check the [Existing themes](#) or try some in the [Live demo](#) section. The [theme selector demo](#) is useful to see how a given theme and color hue looks on the display.

To be more specific, a theme is a structure variable that contains a lot of `lv_style_t` \* fields. For buttons:

```

theme.btn.rel    /* Style de bouton relâché */
theme.btn.pr     /* Style de bouton pressé */
theme.btn.tgl_rel /* Style de bouton bascule relâché */
theme.btn.tgl_pr  /* Style de bouton bascule pressé */
theme.btn.ina    /* Style de bouton inactif */

```

Un thème peut être initialisé par : `lv_theme_<nom>_init(hue, font)`. Où `hue` est une valeur de teinte de l' [espace colorimétrique HSV] (<https://en.wikipedia.org/wiki/Hue>) (0..360) et `font` est la police appliquée dans le thème (NULL utilise `LV_FONT_DEFAULT`)

Quand un thème est initialisé, ses styles peuvent être utilisés comme ceci :





```

/* Crée un curseur par défaut */
lv_obj_t *slider = lv_slider_create(lv_scr_act(), NULL);
lv_slider_set_value(slider, 70);
lv_obj_set_pos(slider, 10, 10);

/* Initialise le thème alien avec une teinte rouge */
lv_theme_t *th = lv_theme_alien_init(10, NULL);

/* Crée un nouveau curseur et applique les styles du thème */
slider = lv_slider_create(lv_scr_act(), NULL);
lv_slider_set_value(slider, 70);
lv_obj_set_pos(slider, 10, 50);
lv_slider_set_style(slider, LV_SLIDER_STYLE_BG, th->slider.bg);
lv_slider_set_style(slider, LV_SLIDER_STYLE_INDIC, th->slider.indic);
lv_slider_set_style(slider, LV_SLIDER_STYLE_KNOB, th->slider.knob);

```

You can ask the library to automatically apply the styles from a theme when you create new objects. To do this use `lv_theme_set_current(th)`.

```

/* Initialise le thème alien avec une teinte rouge */
lv_theme_t *th = lv_theme_alien_init(10, NULL);
lv_theme_set_current(th);

/* Crée un curseur. Il utilisera le style du thème actuel. */
slider = lv_slider_create(lv_scr_act(), NULL);

```

Themes can be enabled or disabled one by one in `lv_conf.h`.

### Mise à jour automatique

By default, if `lv_theme_set_current(th)` is called again, it won't refresh the styles of the existing objects. To enable live update of themes, enable `LV_THEME_LIVE_UPDATE` in `lv_conf.h`.

Live update will only update objects using the unchanged theme styles, i.e. objects created after the first call of `lv_theme_set_current(th)` or to which the theme's styles were applied manually.

### Périphériques d'entrée

Un périphérique d'entrée signifie généralement :

- Périphérique de type pointeur tel que pavé tactile ou souris
- Claviers, normal ou simple pavé numérique
- Encodeurs avec mouvement rotatif à gauche / droite et bouton
- Boutons matériels externes affectés à des points spécifiques de l'écran

---

**Important:** Avant de poursuivre votre lecture, veuillez lire la section [Portage](/porting/indev) sur les périphériques d'entrée

---

### Pointeurs

Les périphériques d'entrée de type pointeur peuvent avoir un curseur (typiquement pour les souris).

```

...
lv_indev_t * mouse_indev = lv_indev_drv_register(&indev_drv);

LV_IMG_DECLARE(mouse_cursor_icon);           /* Declare le fichier de l
↪ 'image. */
lv_obj_t * cursor_obj = lv_img_create(lv_scr_act(), NULL); /* Crée un objet image
↪ pour le curseur */
lv_img_set_src(cursor_obj, &mouse_cursor_icon); /* Définit la source de l
↪ 'image */
lv_indev_set_cursor(mouse_indev, cursor_obj);  /* Connecte l'objet image
↪ au pilote */

```

Notez que l' objet curseur devrait avoir `lv_obj_set_click(cursor_obj, false)`. Pour les images *cliquer* est désactivé par défaut.

## Clavier et encodeur

Vous pouvez contrôler entièrement l' interface utilisateur sans pavé tactile ou souris à l' aide d' un clavier ou d' un ou plusieurs encodeurs. Cela fonctionne de manière similaire à la touche *TAB* sur un PC pour sélectionner l' élément dans une application ou une page Web.

## Groupe

Les objets que vous souhaitez contrôler avec un clavier ou un encodeur doivent être ajoutés à un *groupe*. Dans chaque groupe, il y a exactement un seul objet focalisé qui reçoit les notifications de touche pressée ou les actions de l' encodeur. Par exemple, si une *Zone de texte* est sélectionnée et que vous appuyez sur une lettre d' un clavier, les codes sont envoyés et traités par la zone de texte. De la même manière, si un *Curseur* est sélectionné et que vous appuyez sur les flèches gauche ou droite, la valeur du curseur sera modifiée.

Vous devez associer un périphérique d' entrée à un groupe. Un périphérique d' entrée peut envoyer les codes à un seul groupe, mais un groupe peut recevoir des données de plusieurs périphériques d' entrée.

Pour créer un groupe, utilisez `lv_group_t * g = lv_group_create()` et pour ajouter un objet au groupe, utilisez `lv_group_add_obj(g, obj)`.

Pour associer un groupe à un périphérique d' entrée, utilisez `lv_indev_set_group(indev, g)`, où `indev` est la valeur de retour de `lv_indev_drv_register()`

## Codes

Certains codes prédéfinis ont une signification particulière :

- **LV\_KEY\_NEXT** Sélectionne l' objet suivant
- **LV\_KEY\_PREV** Sélectionne l' objet précédant
- **LV\_KEY\_ENTER** Génère les événements **LV\_EVENT\_PRESSED/CLICKED/LONG\_PRESSED** etc
- **LV\_KEY\_UP** Augmente la valeur ou se déplace vers le haut
- **LV\_KEY\_DOWN** Diminue la valeur ou se déplace vers le bas
- **LV\_KEY\_RIGHT** Augmente la valeur ou se déplace vers la droite
- **LV\_KEY\_LEFT** Diminue la valeur ou se déplace vers la gauche
- **LV\_KEY\_ESC** Ferme ou quitte (p.ex. ferme une *Liste déroulante*)

- **LV\_KEY\_DEL** Supprime (p.ex. le caractère à droite dans une *Zone de texte*)
- **LV\_KEY\_BACKSPACE** Supprime le caractère à gauche (p.ex. dans une *Zone de texte*)
- **LV\_KEY\_HOME** Se déplace au début ou en haut (p.ex. dans une *Zone de texte*)
- **LV\_KEY\_END** Se déplace à la fin (p.ex. dans une *Zone de texte*)

Les codes spéciaux les plus importants sont : **LV\_KEY\_NEXT/PREV**, **LV\_KEY\_ENTER** et **LV\_KEY\_UP/DOWN/LEFT/RIGHT**. Dans votre fonction **read\_cb**, vous devez traduire certaines de vos codes en ces codes spéciaux pour naviguer dans le groupe et interagir avec l' objet sélectionné.

Habituellement, il suffit d' utiliser uniquement **LV\_KEY\_LEFT/RIGHT** car la plupart des objets peuvent être entièrement contrôlés avec eux.

Avec un encodeur, vous devez utiliser uniquement **LV\_KEY\_LEFT**, **LV\_KEY\_RIGHT** et **LV\_KEY\_ENTER**.

## Edition et navigation

Comme les claviers disposent de nombreuses touches, il est facile de naviguer entre les objets et de les éditer. Cependant, les encodeurs ont un nombre très limité de “touches” ce qui rend la navigation difficile pas défaut. Les modes *navigation* et *édition* sont créés afin de résoudre ce problème avec les encodeurs, .

En mode *navigation*, les **LV\_KEY\_LEFT/RIGHT** des encodeurs sont traduits en **LV\_KEY\_NEXT/PREV**. Par conséquent, l' objet suivant ou précédent sera sélectionné en tournant l' encodeur. Un appui sur **LV\_KEY\_ENTER** passera en mode *édition*.

En mode *édition*, **LV\_KEY\_NEXT/PREV** sont utilisés normalement pour éditer l' objet. En fonction du type d' objet, une pression courte ou longue de **LV\_KEY\_ENTER** repasse en mode *navigation*. Généralement, un objet sur lequel vous ne pouvez pas appuyer (comme un *Curseur*) quitte le mode *édition* en cas de clic bref, mais avec un objet pour lequel un clic court a une signification (par exemple, *Bouton*) un appui long est requis.

## Styliser l' objet sélectionné

Pour mettre en évidence visuellement l' élément sélectionné, son [Style principal] (/overview/style#utiliser-les-styles) sera mis à jour. Par défaut, de l' orange est mélangé aux couleurs d' origine du style. Une fonction de rappel pour modifier le style est définie par **lv\_group\_set\_style\_mod\_cb(g, my\_style\_mod\_cb)**. Cette fonction reçoit un pointeur sur un groupe d' objet et un style à modifier. Le modificateur de style par défaut ressemble à ceci (légèrement simplifié) :

```
static void default_style_mod_cb(lv_group_t * group, lv_style_t * style)
{
    /* Rend les corps un peu orange */
    style->body.border.opa = LV_OPA_COVER;
    style->body.border.color = LV_COLOR_ORANGE;
    style->body.border.width = LV_DPI / 20;

    style->body.main_color = lv_color_mix(style->body.main_color, LV_COLOR_ORANGE,
↪ LV_OPA_70);
    style->body.grad_color = lv_color_mix(style->body.grad_color, LV_COLOR_ORANGE,
↪ LV_OPA_70);
    style->body.shadow.color = lv_color_mix(style->body.shadow.color, LV_COLOR_ORANGE,
↪ LV_OPA_60);

    /* Recolore le texte*/
    style->text.color = lv_color_mix(style->text.color, LV_COLOR_ORANGE, LV_OPA_70);
}
```

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```

/* Colorise les images */
if(style->image.intense < LV_OPA_MIN) {
    style->image.color = LV_COLOR_ORANGE;
    style->image.intense = LV_OPA_40;
}
}

```

Cette fonction de rappel modificateur de style est utilisée pour les claviers et encodeurs en mode *navigation*. En mode *édition*, une autre fonction de rappel est utilisée qui peut être définie avec `lv_group_set_style_mod_edit_cb()`. Par défaut, il utilise la couleur verte.

## Démonstration en ligne

Essayez cette [Démonstration en ligne](#) pour voir comment une navigation de groupe sans pavé tactile fonctionne dans la pratique.

## API

### Périphérique d'entrée

#### Functions

void **lv\_indev\_init**(void)  
Initialize the display input device subsystem

void **lv\_indev\_read\_task**(*lv\_task\_t* \*task)  
Called periodically to read the input devices

#### Parameters

- **task**: pointer to the task itself

*lv\_indev\_t* \***lv\_indev\_get\_act**(void)  
Get the currently processed input device. Can be used in action functions too.

**Return** pointer to the currently processed input device or NULL if no input device processing right now

*lv\_indev\_type\_t* **lv\_indev\_get\_type**(const *lv\_indev\_t* \*indev)  
Get the type of an input device

**Return** the type of the input device from `lv_hal_indev_type_t` (LV\_INDEV\_TYPE\_...)

#### Parameters

- **indev**: pointer to an input device

void **lv\_indev\_reset**(*lv\_indev\_t* \*indev)  
Reset one or all input devices

#### Parameters

- **indev**: pointer to an input device to reset or NULL to reset all of them

void **lv\_indev\_reset\_long\_press**(*lv\_indev\_t* \*indev)  
Reset the long press state of an input device

### Parameters

- **indev\_proc**: pointer to an input device

void **lv\_indev\_enable**(*lv\_indev\_t* \**indev*, bool *en*)

Enable or disable an input devices

### Parameters

- **indev**: pointer to an input device
- **en**: true: enable; false: disable

void **lv\_indev\_set\_cursor**(*lv\_indev\_t* \**indev*, *lv\_obj\_t* \**cur\_obj*)

Set a cursor for a pointer input device (for LV\_INPUT\_TYPE\_POINTER and LV\_INPUT\_TYPE\_BUTTON)

### Parameters

- **indev**: pointer to an input device
- **cur\_obj**: pointer to an object to be used as cursor

void **lv\_indev\_set\_group**(*lv\_indev\_t* \**indev*, *lv\_group\_t* \**group*)

Set a destination group for a keypad input device (for LV\_INDEV\_TYPE\_KEYPAD)

### Parameters

- **indev**: pointer to an input device
- **group**: point to a group

void **lv\_indev\_set\_button\_points**(*lv\_indev\_t* \**indev*, const *lv\_point\_t* \**points*)

Set the an array of points for LV\_INDEV\_TYPE\_BUTTON. These points will be assigned to the buttons to press a specific point on the screen

### Parameters

- **indev**: pointer to an input device
- **group**: point to a group

void **lv\_indev\_get\_point**(const *lv\_indev\_t* \**indev*, *lv\_point\_t* \**point*)

Get the last point of an input device (for LV\_INDEV\_TYPE\_POINTER and LV\_INDEV\_TYPE\_BUTTON)

### Parameters

- **indev**: pointer to an input device
- **point**: pointer to a point to store the result

uint32\_t **lv\_indev\_get\_key**(const *lv\_indev\_t* \**indev*)

Get the last pressed key of an input device (for LV\_INDEV\_TYPE\_KEYPAD)

**Return** the last pressed key (0 on error)

### Parameters

- **indev**: pointer to an input device

bool **lv\_indev\_is\_dragging**(const *lv\_indev\_t* \**indev*)

Check if there is dragging with an input device or not (for LV\_INDEV\_TYPE\_POINTER and LV\_INDEV\_TYPE\_BUTTON)

**Return** true: drag is in progress

### Parameters

- **indev**: pointer to an input device

void **lv\_indev\_get\_vect**(const *lv\_indev\_t* \*indev, lv\_point\_t \*point)

Get the vector of dragging of an input device (for LV\_INDEV\_TYPE\_POINTER and LV\_INDEV\_TYPE\_BUTTON)

#### Parameters

- **indev**: pointer to an input device
- **point**: pointer to a point to store the vector

void **lv\_indev\_wait\_release**(*lv\_indev\_t* \*indev)

Do nothing until the next release

#### Parameters

- **indev**: pointer to an input device

*lv\_task\_t* \***lv\_indev\_get\_read\_task**(*lv\_disp\_t* \*indev)

Get a pointer to the indev read task to modify its parameters with **lv\_task\_...** functions.

**Return** pointer to the indev read refresher task. (NULL on error)

#### Parameters

- **indev**: pointer to an input device

*lv\_obj\_t* \***lv\_indev\_get\_obj\_act**(void)

Gets a pointer to the currently active object in indev proc functions. NULL if no object is currently being handled or if groups aren't used.

**Return** pointer to currently active object

## Groupes

### Typedefs

**typedef** uint8\_t **lv\_key\_t**

**typedef** void (\***lv\_group\_style\_mod\_cb\_t**)(struct *\_lv\_group\_t* \*, lv\_style\_t \*)

**typedef** void (\***lv\_group\_focus\_cb\_t**)(struct *\_lv\_group\_t* \*)

**typedef** struct *\_lv\_group\_t* **lv\_group\_t**

Groups can be used to logically hold objects so that they can be individually focused. They are NOT for laying out objects on a screen (try **lv\_cont** for that).

**typedef** uint8\_t **lv\_group\_refocus\_policy\_t**

### Enums

**enum** [anonymous]

*Values:*

**LV\_KEY\_UP** = 17

**LV\_KEY\_DOWN** = 18

**LV\_KEY\_RIGHT** = 19

**LV\_KEY\_LEFT** = 20

```

LV_KEY_ESC = 27
LV_KEY_DEL = 127
LV_KEY_BACKSPACE = 8
LV_KEY_ENTER = 10
LV_KEY_NEXT = 9
LV_KEY_PREV = 11
LV_KEY_HOME = 2
LV_KEY_END = 3

```

**enum** [anonymous]

*Values:*

```

LV_GROUP_REFOCUS_POLICY_NEXT = 0
LV_GROUP_REFOCUS_POLICY_PREV = 1

```

## Functions

void **lv\_group\_init**(void)

Init. the group module

**Remark** Internal function, do not call directly.

*lv\_group\_t* \***lv\_group\_create**(void)

Create a new object group

**Return** pointer to the new object group

void **lv\_group\_del**(*lv\_group\_t* \*group)

Delete a group object

**Parameters**

- group: pointer to a group

void **lv\_group\_add\_obj**(*lv\_group\_t* \*group, *lv\_obj\_t* \*obj)

Add an object to a group

**Parameters**

- group: pointer to a group
- obj: pointer to an object to add

void **lv\_group\_remove\_obj**(*lv\_obj\_t* \*obj)

Remove an object from its group

**Parameters**

- obj: pointer to an object to remove

void **lv\_group\_remove\_all\_objs**(*lv\_group\_t* \*group)

Remove all objects from a group

**Parameters**

- group: pointer to a group

void **lv\_group\_focus\_obj**(*lv\_obj\_t* \*obj)

Focus on an object (defocus the current)

#### Parameters

- **obj**: pointer to an object to focus on

void **lv\_group\_focus\_next**(*lv\_group\_t \*group*)  
Focus the next object in a group (defocus the current)

#### Parameters

- **group**: pointer to a group

void **lv\_group\_focus\_prev**(*lv\_group\_t \*group*)  
Focus the previous object in a group (defocus the current)

#### Parameters

- **group**: pointer to a group

void **lv\_group\_focus\_freeze**(*lv\_group\_t \*group*, bool *en*)  
Do not let to change the focus from the current object

#### Parameters

- **group**: pointer to a group
- **en**: true: freeze, false: release freezing (normal mode)

lv\_res\_t **lv\_group\_send\_data**(*lv\_group\_t \*group*, uint32\_t *c*)  
Send a control character to the focuses object of a group

**Return** result of focused object in group.

#### Parameters

- **group**: pointer to a group
- **c**: a character (use LV\_KEY\_.. to navigate)

void **lv\_group\_set\_style\_mod\_cb**(*lv\_group\_t \*group*, *lv\_group\_style\_mod\_cb\_t style\_mod\_cb*)  
Set a function for a group which will modify the object' s style if it is in focus

#### Parameters

- **group**: pointer to a group
- **style\_mod\_cb**: the style modifier function pointer

void **lv\_group\_set\_style\_mod\_edit\_cb**(*lv\_group\_t \*group*, *lv\_group\_style\_mod\_cb\_t style\_mod\_edit\_cb*)  
Set a function for a group which will modify the object' s style if it is in focus in edit mode

#### Parameters

- **group**: pointer to a group
- **style\_mod\_edit\_cb**: the style modifier function pointer

void **lv\_group\_set\_focus\_cb**(*lv\_group\_t \*group*, *lv\_group\_focus\_cb\_t focus\_cb*)  
Set a function for a group which will be called when a new object is focused

#### Parameters

- **group**: pointer to a group
- **focus\_cb**: the call back function or NULL if unused

void **lv\_group\_set\_refocus\_policy**(*lv\_group\_t \*group*, *lv\_group\_refocus\_policy\_t policy*)  
Set whether the next or previous item in a group is focused if the currently focussed obj is deleted.



#### Parameters

- **group**: pointer to a group
- **new**: refocus policy enum

void **lv\_group\_set\_editing**(*lv\_group\_t* \*group, bool edit)

Manually set the current mode (edit or navigate).

#### Parameters

- **group**: pointer to group
- **edit**: true: edit mode; false: navigate mode

void **lv\_group\_set\_click\_focus**(*lv\_group\_t* \*group, bool en)

Set the **click\_focus** attribute. If enabled then the object will be focused then it is clicked.

#### Parameters

- **group**: pointer to group
- **en**: true: enable **click\_focus**

void **lv\_group\_set\_wrap**(*lv\_group\_t* \*group, bool en)

Set whether focus next/prev will allow wrapping from first->last or last->first object.

#### Parameters

- **group**: pointer to group
- **en**: true: wrapping enabled; false: wrapping disabled

*lv\_style\_t* \***lv\_group\_mod\_style**(*lv\_group\_t* \*group, const *lv\_style\_t* \*style)

Modify a style with the set 'style\_mod' function. The input style remains unchanged.

**Return** a copy of the input style but modified with the 'style\_mod' function

#### Parameters

- **group**: pointer to group
- **style**: pointer to a style to modify

*lv\_obj\_t* \***lv\_group\_get\_focused**(const *lv\_group\_t* \*group)

Get the focused object or NULL if there isn't one

**Return** pointer to the focused object

#### Parameters

- **group**: pointer to a group

*lv\_group\_user\_data\_t* \***lv\_group\_get\_user\_data**(*lv\_group\_t* \*group)

Get a pointer to the group's user data

**Return** pointer to the user data

#### Parameters

- **group**: pointer to an group

*lv\_group\_style\_mod\_cb\_t* **lv\_group\_get\_style\_mod\_cb**(const *lv\_group\_t* \*group)

Get a the style modifier function of a group

**Return** pointer to the style modifier function

#### Parameters

- **group**: pointer to a group

*lv\_group\_style\_mod\_cb\_t* **lv\_group\_get\_style\_mod\_edit\_cb**(const *lv\_group\_t* \*group)

Get a the style modifier function of a group in edit mode

**Return** pointer to the style modifier function

**Parameters**

- **group**: pointer to a group

*lv\_group\_focus\_cb\_t* **lv\_group\_get\_focus\_cb**(const *lv\_group\_t* \*group)

Get the focus callback function of a group

**Return** the call back function or NULL if not set

**Parameters**

- **group**: pointer to a group

bool **lv\_group\_get\_editing**(const *lv\_group\_t* \*group)

Get the current mode (edit or navigate).

**Return** true: edit mode; false: navigate mode

**Parameters**

- **group**: pointer to group

bool **lv\_group\_get\_click\_focus**(const *lv\_group\_t* \*group)

Get the **click\_focus** attribute.

**Return** true: **click\_focus** is enabled; false: disabled

**Parameters**

- **group**: pointer to group

bool **lv\_group\_get\_wrap**(*lv\_group\_t* \*group)

Get whether focus next/prev will allow wrapping from first->last or last->first object.

**Parameters**

- **group**: pointer to group
- **en**: true: wrapping enabled; false: wrapping disabled

void **lv\_group\_report\_style\_mod**(*lv\_group\_t* \*group)

Notify the group that current theme changed and style modification callbacks need to be refreshed.

**Parameters**

- **group**: pointer to group. If NULL then all groups are notified.

**struct \_lv\_group\_t**

*#include <lv\_group.h>* Groups can be used to logically hold objects so that they can be individually focused. They are NOT for laying out objects on a screen (try **lv\_cont** for that).

## Public Members

*lv\_ll\_t* **obj\_ll**

Linked list to store the objects in the group

*lv\_obj\_t* \*\***obj\_focus**

The object in focus

`lv_group_style_mod_cb_t` **style\_mod\_cb**

A function to modifies the style of the focused object

`lv_group_style_mod_cb_t` **style\_mod\_edit\_cb**

A function which modifies the style of the edited object

`lv_group_focus_cb_t` **focus\_cb**

A function to call when a new object is focused (optional)

`lv_style_t` **style\_tmp**

Stores the modified style of the focused object

`lv_group_user_data_t` **user\_data**

`uint8_t` **frozen**

1: can't focus to new object

`uint8_t` **editing**

1: Edit mode, 0: Navigate mode

`uint8_t` **click\_focus**

1: If an object in a group is clicked by an indev then it will be focused

`uint8_t` **refocus\_policy**

1: Focus prev if focused on deletion. 0: Focus next if focused on deletion.

`uint8_t` **wrap**

1: Focus next/prev can wrap at end of list. 0: Focus next/prev stops at end of list.

## Affichage

---

**Important:** The basic concept of *display* in LittlevGL is explained in the [Porting](/porting/display) section. So before reading further, please read the [Porting](/porting/display) section first.

---

In LittlevGL, you can have multiple displays, each with their own driver and objects.

Creating more displays is easy: just initialize more display buffers and register another driver for every display. When you create the UI, use `lv_disp_set_default(disp)` to tell the library which display to create objects on.

Why would you want multi-display support? Here are some examples:

- Have a “normal” TFT display with local UI and create “virtual” screens on VNC on demand. (You need to add your VNC driver).
- Avoir un grand écran TFT et un petit écran monochrome.
- Have some smaller and simple displays in a large instrument or technology.
- Have two large TFT displays: one for a customer and one for the shop assistant.

## Utiliser un seul affichage

Using more displays can be useful, but in most cases, it's not required. Therefore, the whole concept of multi-display is completely hidden if you register only one display. By default, the lastly created (the only one) display is used as default.

`lv_scr_act()`, `lv_scr_load(scr)`, `lv_layer_top()`, `lv_layer_sys()`, `LV_HOR_RES` et `LV_VER_RES` sont toujours appliqués sur l'affichage créé en dernier (par défaut). If you pass

NULL as `disp` parameter to display related function, usually the default display will be used. P.ex. `lv_disp_trig_activity(NULL)` déclenchera une activité utilisateur sur l’affichage par défaut (voir ci-dessous dans *Inactivité*).

## Affichage miroir

To mirror the image of the display to another display, you don’ t need to use the multi-display support. Just transfer the buffer received in `drv.flush_cb` to another display too.

## Division d’ image

You can create a larger display from smaller ones. You can create it as below:

1. Set the resolution of the displays to the large display’ s resolution.
2. In `drv.flush_cb`, truncate and modify the `area` parameter for each display.
3. Send the buffer’ s content to each display with the truncated area.

## Ecrans

Every display has each set of *Screens* and the object on the screens.

Be sure not to confuse displays and screens:

- **Displays** are the physical hardware drawing the pixels.
- **Screens** are the high-level root objects associated with a particular display. One display can have multiple screens associated with it, but not vice versa.

Screens can be considered the highest level containers which have no parent. The screen’ s size is always equal to its display and size their position is (0;0). Therefore, the screens coordinates can’ t be changed, i.e. `lv_obj_set_pos()`, `lv_obj_set_size()` or similar functions can’ t be used on screens.

A screen can be created from any object type but, the two most typical types are the *Base object* and the *Image* (to create a wallpaper).

To create a screen, use `lv_obj_t * scr = lv_<type>_create(NULL, copy)`. `copy` can be an other screen to copy it.

To load a screen, use `lv_scr_load(scr)`. To get the active screen, use `lv_scr_act()`. These functions works on the default display. If you want to to specify which display to work on, use `lv_disp_get_scr_act(disp)` and `lv_disp_load_scr(disp, scr)`.

Screens can be deleted with `lv_obj_del(scr)`, but ensure that you do not delete the currently loaded screen.

## Ecran opaque

Usually, the opacity of the screen is `LV_OPA_COVER` to provide a solid background for its children.

However, in some special cases, you might want a transparent screen. For example, if you have a video player that renders video frames on a lower layer, you want to create an OSD menu on the upper layer (over the video) using LittlevGL.

To do this, the screen should have a style that sets `body.opa` or `image.opa` to `LV_OPA_TRANSP` (or another non-opaque value) to make the screen opaque.

Also, `LV_COLOR_SCREEN_TRANSP` needs to be enabled. Please note that it only works with `LV_COLOR_DEPTH = 32`.

The Alpha channel of 32-bit colors will be 0 where there are no objects and will be 255 where there are solid objects.

## Fonctionnalités des affichages

### Inactivité

The user's inactivity is measured on each display. Every use of an *Input device* (if associated with the display) counts as an activity. To get time elapsed since the last activity, use `lv_disp_get_inactive_time disp`). If `NULL` is passed, the overall smallest inactivity time will be returned from all displays (**not the default display**).

You can manually trigger an activity using `lv_disp_trig_activity disp`). If `disp` is `NULL`, the default screen will be used (**and not all displays**).

### Couleurs

The color module handles all color-related functions like changing color depth, creating colors from hex code, converting between color depths, mixing colors, etc.

Les types de variable suivants sont définis par le module couleur :

- `lv_color1_t` Store monochrome color. For compatibility, it also has R, G, B fields but they are always the same value (1 byte)
- `lv_color8_t` A structure to store R (3 bit),G (3 bit),B (2 bit) components for 8-bit colors (1 byte)
- `lv_color16_t` A structure to store R (5 bit),G (6 bit),B (5 bit) components for 16-bit colors (2 byte)
- `lv_color32_t` A structure to store R (8 bit),G (8 bit), B (8 bit) components for 24-bit colors (4 byte)
- `lv_color_t` Equivaut à `lv_color1/8/16/24_t` selon le paramètre de profondeur de couleur
- `lv_color_int_t` `uint8_t`, `uint16_t` ou `uint32_t` selon le paramètre de profondeur de couleur. Utilisé pour construire des tableaux de couleurs à partir de valeurs numériques.
- `lv_opa_t` Un simple type `uint8_t` pour définir l' opacité.

Les types `lv_color_t`, `lv_color1_t`, `lv_color8_t`, `lv_color16_t` et `lv_color32_t` ont quatre champs :

- `ch.red` canal rouge
- `ch.green` canal vert
- `ch.blue` canal bleu
- `full` rouge + vert + bleu en une seule valeur

You can set the current color depth in *lv\_conf.h*, by setting the `LV_COLOR_DEPTH` define to 1 (monochrome), 8, 16 or 32.

### Conversion de couleur

You can convert a color from the current color depth to another. The converter functions return with a number, so you have to use the `full` field:

```
lv_color_t c;
c.red   = 0x38;
c.green = 0x70;
c.blue  = 0xCC;

lv_color1_t c1;
c1.full = lv_color_to1(c);      /* Retourne 1 pour les couleurs claires, 0 pour les
↪couleurs sombres */

lv_color8_t c8;
c8.full = lv_color_to8(c);      /*Give a 8 bit number with the converted color*/

lv_color16_t c16;
c16.full = lv_color_to16(c); /* Donne un nombre de 16 bits avec la couleur convertie
↪*/

lv_color32_t c32;
c32.full = lv_color_to32(c);    /* Donne un nombre de 32 bits avec la couleur
↪convertie */
```

### Permutation 16 bits

You may set `LV_COLOR_16_SWAP` in `lv_conf.h` to swap the bytes of *RGB565* colors. It's useful if you send the 16-bit colors via a byte-oriented interface like SPI.

As 16-bit numbers are stored in Little Endian format (lower byte on the lower address), the interface will send the lower byte first. However, displays usually need the higher byte first. A mismatch in the byte order will result in highly distorted colors.

### Créer et mélanger les couleurs

You can create colors with the current color depth using the `LV_COLOR_MAKE` macro. It takes 3 arguments (red, green, blue) as 8-bit numbers. For example to create light red color: `my_color = COLOR_MAKE(0xFF, 0x80, 0x80)`.

Les couleurs peuvent aussi être créées à partir de codes hexadécimaux : `my_color = lv_color_hex(0x288ACF)` ou `my_color = lv_color_hex(0x28C)`.

Mixing two colors is possible with `mixed_color = lv_color_mix(color1, color2, ratio)`. Ratio can be 0..255. 0 results fully color2, 255 result fully color1.

Colors can be created with from HSV space too using `lv_color_hsv_to_rgb(hue, saturation, value)`. `hue` should be in 0..360 range, `saturation` and `value` in 0..100 range.

### Opacité

To describe opacity the `lv_opa_t` type is created as a wrapper to `uint8_t`. Some defines are also introduced:


- `LV_OPA_TRANSP` Value: 0, means the opacity makes the color completely transparent
- `LV_OPA_10` Valeur : 25, signifie que la couleur est un peu couvrante
- `LV_OPA_20 ... OPA_80` viennent logiquement

- **LV\_OPA\_90** Value: 229, means the color near completely covers
- **LV\_OPA\_COVER** Value: 255, means the color completely covers

You can also use the `LV_OPA_*` defines in `lv_color_mix()` as a *ratio*.

## Couleurs intégrées

The color module defines the most basic colors such as:

-  `#FFFFFF` **LV\_COLOR\_WHITE**
-  `#000000` **LV\_COLOR\_BLACK**
-  `#808080` **LV\_COLOR\_GRAY**
-  `#c0c0c0` **LV\_COLOR\_SILVER**
-  `#ff0000` **LV\_COLOR\_RED**
-  `#800000` **LV\_COLOR\_MAROON**
-  `#00ff00` **LV\_COLOR\_LIME**
-  `#008000` **LV\_COLOR\_GREEN**
-  `#808000` **LV\_COLOR\_OLIVE**
-  `#0000ff` **LV\_COLOR\_BLUE**
-  `#000080` **LV\_COLOR\_NAVY**
-  `#008080` **LV\_COLOR\_TEAL**
-  `#00ffff` **LV\_COLOR\_CYAN**
-  `#00ffff` **LV\_COLOR\_AQUA**
-  `#800080` **LV\_COLOR\_PURPLE**
-  `#ff00ff` **LV\_COLOR\_MAGENTA**
-  `#ffa500` **LV\_COLOR\_ORANGE**
-  `#ffff00` **LV\_COLOR\_YELLOW**

as well as **LV\_COLOR\_WHITE** (fully white).

## API

### Affichage

#### Functions

*lv\_obj\_t* \***lv\_disp\_get\_scr\_act**(*lv\_disp\_t* \*disp)

Return with a pointer to the active screen

**Return** pointer to the active screen object (loaded by `'lv_scr_load()'` )

#### Parameters

- **disp**: pointer to display which active screen should be get. (NULL to use the default screen)

void **lv\_disp\_load\_scr**(*lv\_obj\_t* \*scr)

Make a screen active

#### Parameters

- **scr**: pointer to a screen

*lv\_obj\_t* \***lv\_disp\_get\_layer\_top**(*lv\_disp\_t* \*disp)

Return with the top layer. (Same on every screen and it is above the normal screen layer)

**Return** pointer to the top layer object (transparent screen sized lv\_obj)

#### Parameters

- **disp**: pointer to display which top layer should be get. (NULL to use the default screen)

*lv\_obj\_t* \***lv\_disp\_get\_layer\_sys**(*lv\_disp\_t* \*disp)

Return with the sys. layer. (Same on every screen and it is above the normal screen and the top layer)

**Return** pointer to the sys layer object (transparent screen sized lv\_obj)

#### Parameters

- **disp**: pointer to display which sys. layer should be get. (NULL to use the default screen)

void **lv\_disp\_assign\_screen**(*lv\_disp\_t* \*disp, *lv\_obj\_t* \*scr)

Assign a screen to a display.

#### Parameters

- **disp**: pointer to a display where to assign the screen
- **scr**: pointer to a screen object to assign

*lv\_task\_t* \***lv\_disp\_get\_refr\_task**(*lv\_disp\_t* \*disp)

Get a pointer to the screen refresher task to modify its parameters with **lv\_task\_...** functions.

**Return** pointer to the display refresher task. (NULL on error)

#### Parameters

- **disp**: pointer to a display

uint32\_t **lv\_disp\_get\_inactive\_time**(const *lv\_disp\_t* \*disp)

Get elapsed time since last user activity on a display (e.g. click)

**Return** elapsed ticks (milliseconds) since the last activity

#### Parameters

- **disp**: pointer to an display (NULL to get the overall smallest inactivity)

void **lv\_disp\_trig\_activity**(*lv\_disp\_t* \*disp)

Manually trigger an activity on a display

#### Parameters

- **disp**: pointer to an display (NULL to use the default display)

static *lv\_obj\_t* \***lv\_scr\_act**(void)

Get the active screen of the default display

**Return** pointer to the active screen



```
static lv_obj_t *lv_layer_top(void)
    Get the top layer of the default display

    Return pointer to the top layer

static lv_obj_t *lv_layer_sys(void)
    Get the active screen of the default display

    Return pointer to the sys layer

static void lv_scr_load(lv_obj_t *scr)
```

## Couleurs

### Typedefs

```
typedef uint32_t lv_color_int_t
typedef lv_color32_t lv_color_t
typedef uint8_t lv_opa_t
```

### Enums

```
enum [anonymous]
    Opacity percentages.

    Values:

    LV_OPA_TRANSP = 0
    LV_OPA_0 = 0
    LV_OPA_10 = 25
    LV_OPA_20 = 51
    LV_OPA_30 = 76
    LV_OPA_40 = 102
    LV_OPA_50 = 127
    LV_OPA_60 = 153
    LV_OPA_70 = 178
    LV_OPA_80 = 204
    LV_OPA_90 = 229
    LV_OPA_100 = 255
    LV_OPA_COVER = 255
```

### Functions

```
static uint8_t lv_color_to1(lv_color_t color)
static uint8_t lv_color_to8(lv_color_t color)
static uint16_t lv_color_to16(lv_color_t color)
```

**static** uint32\_t **lv\_color\_to32**(*lv\_color\_t* color)

**static** *lv\_color\_t* **lv\_color\_mix**(*lv\_color\_t* c1, *lv\_color\_t* c2, uint8\_t mix)

**static** uint8\_t **lv\_color\_brightness**(*lv\_color\_t* color)

Get the brightness of a color

**Return** the brightness [0..255]

**Parameters**

- **color**: a color

**static** *lv\_color\_t* **lv\_color\_make**(uint8\_t r, uint8\_t g, uint8\_t b)

**static** *lv\_color\_t* **lv\_color\_hex**(uint32\_t c)

**static** *lv\_color\_t* **lv\_color\_hex3**(uint32\_t c)

*lv\_color\_t* **lv\_color\_hsv\_to\_rgb**(uint16\_t h, uint8\_t s, uint8\_t v)

Convert a HSV color to RGB

**Return** the given RGB color in RGB (with LV\_COLOR\_DEPTH depth)

**Parameters**

- **h**: hue [0..359]
- **s**: saturation [0..100]
- **v**: value [0..100]

*lv\_color\_hsv\_t* **lv\_color\_rgb\_to\_hsv**(uint8\_t r8, uint8\_t g8, uint8\_t b8)

Convert a 32-bit RGB color to HSV

**Return** the given RGB color in HSV

**Parameters**

- **r8**: 8-bit red
- **g8**: 8-bit green
- **b8**: 8-bit blue

*lv\_color\_hsv\_t* **lv\_color\_to\_hsv**(*lv\_color\_t* color)

Convert a color to HSV

**Return** the given color in HSV

**Parameters**

- **color**: color

**union** **lv\_color1\_t**

**Public Members**

uint8\_t **blue**

uint8\_t **green**

uint8\_t **red**

**struct** *lv\_color1\_t*::[anonymous] **ch**

uint8\_t **full**

## union lv\_color8\_t

### Public Members

uint8\_t **blue**

uint8\_t **green**

uint8\_t **red**

**struct** *lv\_color8\_t*::[anonymous] **ch**

uint8\_t **full**

## union lv\_color16\_t

### Public Members

uint16\_t **blue**

uint16\_t **green**

uint16\_t **red**

uint16\_t **green\_h**

uint16\_t **green\_l**

**struct** *lv\_color16\_t*::[anonymous] **ch**

uint16\_t **full**

## union lv\_color32\_t

### Public Members

uint8\_t **blue**

uint8\_t **green**

uint8\_t **red**

uint8\_t **alpha**

**struct** *lv\_color32\_t*::[anonymous] **ch**

uint32\_t **full**

## struct lv\_color\_hsv\_t

### Public Members

uint16\_t **h**

uint8\_t **s**

uint8\_t **v**

## Polices

In LittlevGL fonts are collections of bitmaps and other information required to render the images of the letters (glyph). A font is stored in a `lv_font_t` variable and can be set in style's `text.font` field. For example:

```
my_style.text.font = &lv_font_roboto_28; /* Définit une police plus grande */
```

The fonts have a **bpp (bits per pixel)** property. It shows how many bits are used to describe a pixel in the font. The value stored for a pixel determines the pixel's opacity. This way, with higher *bpp*, the edges of the letter can be smoother. The possible *bpp* values are 1, 2, 4 and 8 (higher value means better quality).

The *bpp* also affects the required memory size to store the font. For example, *bpp* = 4 makes the font nearly 4 times greater compared to *bpp* = 1.

## Support Unicode

LittlevGL supports **UTF-8** encoded Unicode characters. You need to configure your editor to save your code/text as UTF-8 (usually this the default) and be sure that, `LV_TXT_ENC` is set to `LV_TXT_ENC_UTF8` in `lv_conf.h`. (This is the default value)

Pour le vérifier, essayez

```
lv_obj_t * label1 = lv_label_create(lv_scr_act(), NULL);
lv_label_set_text(label1, LV_SYMBOL_OK);
```

If all works well, a ✓ character should be displayed.

## Polices intégrées


























































There are several built-in fonts in different sizes, which can be enabled in `lv_conf.h` by `LV_FONT_...` defines:

- `LV_FONT_ROBOTO_12` 12 px
- `LV_FONT_ROBOTO_16` 16 px
- `LV_FONT_ROBOTO_22` 22 px
- `LV_FONT_ROBOTO_28` 28 px

The built-in fonts are **global variables** with names like `lv_font_roboto_16` for 16 px hight font. To use them in a style, just add a pointer to a font variable like shown above.

Les polices intégrées ont *bpp* = 4, contiennent les caractères ASCII et utilisent la police [Roboto](#).

In addition to the ASCII range, the following symbols are also added to the built-in fonts from the [FontAwesome](#) font.

	LV_SYMBOL_AUDIO		LV_SYMBOL_WARNING
	LV_SYMBOL_VIDEO		LV_SYMBOL_SHUFFLE
	LV_SYMBOL_LIST		LV_SYMBOL_UP
	LV_SYMBOL_OK		LV_SYMBOL_DOWN
	LV_SYMBOL_CLOSE		LV_SYMBOL_LOOP
	LV_SYMBOL_POWER		LV_SYMBOL_DIRECTORY
	LV_SYMBOL_SETTINGS		LV_SYMBOL_UPLOAD
	LV_SYMBOL_TRASH		LV_SYMBOL_CALL
	LV_SYMBOL_HOME		LV_SYMBOL_CUT
	LV_SYMBOL_DOWNLOAD		LV_SYMBOL_COPY
	LV_SYMBOL_DRIVE		LV_SYMBOL_SAVE
	LV_SYMBOL_REFRESH		LV_SYMBOL_CHARGE
	LV_SYMBOL_MUTE		LV_SYMBOL_PASTE
	LV_SYMBOL_VOLUME_MID		LV_SYMBOL_BELL
	LV_SYMBOL_VOLUME_MAX		LV_SYMBOL_KEYBOARD
	LV_SYMBOL_IMAGE		LV_SYMBOL_GPS
	LV_SYMBOL_EDIT		LV_SYMBOL_FILE
	LV_SYMBOL_PREV		LV_SYMBOL_WIFI
	LV_SYMBOL_PLAY		LV_SYMBOL_BATTERY_FULL
	LV_SYMBOL_PAUSE		LV_SYMBOL_BATTERY_3
	LV_SYMBOL_STOP		LV_SYMBOL_BATTERY_2
	LV_SYMBOL_NEXT		LV_SYMBOL_BATTERY_1
	LV_SYMBOL_EJECT		LV_SYMBOL_BATTERY_EMPTY
	LV_SYMBOL_LEFT		LV_SYMBOL_USB
	LV_SYMBOL_RIGHT		LV_SYMBOL_BLUETOOTH
	LV_SYMBOL_PLUS		LV_SYMBOL_BACKSPACE
	LV_SYMBOL_MINUS		LV_SYMBOL_SD_CARD
	LV_SYMBOL_EYE_OPEN		LV_SYMBOL_NEW_LINE
	LV_SYMBOL_EYE_CLOSE		

Les symboles peuvent être utilisés ainsi :

```
lv_label_set_text(my_label, LV_SYMBOL_OK);
```

Ou avec des chaînes :

```
lv_label_set_text(my_label, LV_SYMBOL_OK "Apply");
```

Ou plusieurs symboles ensemble :

```
lv_label_set_text(my_label, LV_SYMBOL_OK LV_SYMBOL_WIFI LV_SYMBOL_PLAY);
```

## Special features

### Bidirectional support

Most of the languages use Left-to-Right (LTR for short) writing direction, however some languages (such as Hebrew) uses Right-to-Left (RTL for short) direction.

LittlevGL not only supports RTL texts but supports mixed (a.k.a. bidirectional, BiDi) text rendering too. Some examples:

The names of these states in Arabic  
are مصر, البحرين and الكويت respectively.

The title is مفتاح معايير الويب!

The BiDi support can be enabled by `LV_USE_BIDI` in *lv\_conf.h*

All texts have a base direction (LTR or RTL) which determines some rendering rules and the default alignment of the text (Left or Right). However, in LittlevGL, base direction is not only for labels. It's a general property which can be set for every object. If unset then it will be inherited from the parent. So it's enough to set the base direction of the screen and every object will inherit it.

The default base direction of screen can be set by `LV_BIDI_BASE_DIR_DEF` in *lv\_conf.h*.

To set an object's base direction use `lv_obj_set_base_dir(obj, base_dir)`. The possible base direction are:

- `LV_BIDI_DIR_LTR`: Left to Right base direction
- `LV_BIDI_DIR_RTL`: Right to Left base direction
- `LV_BIDI_DIR_AUTO`: Auto detect base direction
- `LV_BIDI_DIR_INHERIT`: Inherit the base direction from the parent (default for non-screen objects)

This list summarizes the effect of RTL base direction on objects:

- Create objects by default on the right
- `lv_tabview`: displays tabs from right to left
- `lv_cb`: Show the box on the right
- `lv_btm`: Show buttons from right to left
- `lv_list`: Show the icon on the right
- `lv_ddlist`: Align the options to the right
- The texts in `lv_table`, `lv_btm`, `lv_kb`, `lv_tabview`, `lv_ddlist`, `lv_roller` are processed to display correctly with RTL parts too

## Subpixel rendering

Subpixel rendering means to increase the horizontal resolution by rendering on Red, Green and Blue channel instead of pixel level. It results in higher quality letter anti-aliasing.

Subpixel rendering requires to generate the fonts with special settings:

- In the online converter tick the **Subpixel** box
- In the command line tool use `--lcd` flag. Note that the generated font needs about 3 times more memory.

Subpixel rendering works only if the color channels of the pixels have a horizontal layout. That is the R, G, B channels are next each other and not above each other. The order of color channels also needs to match with the library settings. By default the LittlevGL assumes **RGB** order, however it can be swapped by setting `LV_SUBPX_BGR 1` in `lv_conf.h`.

## Compress fonts

The bitmaps of the fonts can be compressed by

- ticking the **Compressed** check box in the online converter
- not passing `--no-compress` flag to the offline converter (applies compression by default)

The compression is more effective with larger fonts and higher bpp. However, it's about 30% slower to render the compressed fonts. Therefore it's recommended to compress only the largest fonts of user interface, because

- they need the most memory
- they can be compressed better
- and probably they are used less frequently than the medium sized fonts. (so performance cost is smaller)

## Ajouter une nouvelle police

Il y a plusieurs manières d'ajouter une nouvelle police à votre projet :

1. The simplest method is to use the [Online font converter](#). Just set the parameters, click the *Convert* button, copy the font to your project and use it. **Be sure to carefully read the steps provided on that site or you will get an error while converting.**
2. Utilisez le [Convertisseur de polices hors ligne] ([https://github.com/littlevgl/lv\\_font\\_conv](https://github.com/littlevgl/lv_font_conv)) (nécessite l'installation de Node.js).
3. If you want to create something like the built-in fonts (Roboto font and symbols) but in different size and/or ranges, you can use the `built_in_font_gen.py` script in `lvgl/scripts/built_in_font` folder. (It requires Python and `lv_font_conv` to be installed)

To declare the font in a file, use `LV_FONT_DECLARE(my_font_name)`.

To make the fonts globally available (like the builtin fonts), add them to `LV_FONT_CUSTOM_DECLARE` in `lv_conf.h`.

## Ajouter de nouveaux symboles

The built-in symbols are created from [FontAwesome](#) font.

1. Search symbol on <https://fontawesome.com>. For example the USB symbol. Copy it' s Unicode ID which is **0xf287** in this case.
2. Open the [Online font converter](#). Add Add [FontAwesome.woff](#). .
3. Set the parameters such as Name, Size, BPP. You' ll use this name to declare and use the font in your code.
4. Add the Unicode ID of the symbol to the range field. E.g. **0xf287** for the USB symbol. More symbols can be enumerated with ,.
5. Convert the font and copy it to your project. Make sure to compile the .c file of your font.
6. Declare the font using `extern lv_font_t my_font_name;` or simply `LV_FONT_DECLARE(my_font_name);`.

### Using the symbol

1. Convert the Unicode value to UTF8. You can do it e.g on [this site](#). For **0xf287** the *Hex UTF-8 bytes* are **EF 8A 87**.
2. Create a **define** from the UTF8 values: `#define MY_USB_SYMBOL "\xEF\x8A\x87"`
3. Create a label and set the text. Eg. `lv_label_set_text(label, MY_USB_SYMBOL)`

Note - `lv_label_set_text(label, MY_USB_SYMBOL)` searches for this symbol in the font defined in `style.text.font` properties. To use the symbol you may need to change it. Eg `style.text.font = my_font_name`

## Ajouter un nouveau moteur de polices

LittlevGL' s font interface is designed to be very flexible. You don' t need to use LittlevGL' s internal font engine but, you can add your own. For example, use [FreeType](#) to real-time render glyphs from TTF fonts or use an external flash to store the font' s bitmap and read them when the library needs them.

Pour ce faire, une variable `lv_font_t` personnalisée doit être créée :

```
/* Décrit les propriétés d'une police */
lv_font_t my_font;
my_font.get_glyph_dsc = my_get_glyph_dsc_cb; /* Définit une fonction de rappel_
↳pour obtenir des informations sur les glyphes */
my_font.get_glyph_bitmap = my_get_glyph_bitmap_cb; /* Définit une fonction de rappel_
↳pour obtenir l'image matricielle d'un glyphe */
my_font.line_height = height; /* La hauteur réelle de la ligne_
↳où le texte s'inscrit */
my_font.base_line = base_line; /* La ligne de base mesurée à_
↳partir du haut de la ligne */
my_font.dsc = something_required; /* Enregistre ici toutes les_
↳données spécifiques à l'implémentation */
my_font.user_data = user_data; /* Éventuellement des données_
↳utilisateur supplémentaires */

...

/* Get info about glyph of `unicode_letter` in `font` font.
```

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```

* Enregistre le résultat dans `dsc_out`.
* La lettre suivante (`unicode_letter_next`) peut être utilisée pour calculer la
↪ largeur requise par ce glyphe (crénage)
*/
bool my_get_glyph_dsc_cb(const lv_font_t * font, lv_font_glyph_dsc_t * dsc_out,
↪ uint32_t unicode_letter, uint32_t unicode_letter_next)
{
    /* Votre code ici */

    /* Enregistre le résultat.
    * For example ...
    */
    dsc_out->adv_w = 12;           /* Espace horizontal requis par le glyphe en [px] */
    dsc_out->box_h = 8;           /* Hauteur de l'image en [px] */
    dsc_out->box_w = 6;           /* Largeur de l'image en [px] */
    dsc_out->ofs_x = 0;           /* Déplacement X de l'image en [px] */
    dsc_out->ofs_y = 3;           /* Déplacement Y de l'image mesuré depuis la ligne de
↪ base */
    dsc_out->bpp = 2;             /* Bits per pixel: 1/2/4/8 */

    return true;                 /* true : glyphe trouvé; false : glyphe non trouvé */
}

/* Obtient l'image matricielle de `unicode_letter` à partir de `font`.*/
const uint8_t * my_get_glyph_bitmap_cb(const lv_font_t * font, uint32_t unicode_
↪ letter)
{
    /* Votre code ici */

    /* The bitmap should be a continuous bitstream where
    * each pixel is represented by `bpp` bits */

    return bitmap;               /* Ou NULL si non trouvé */
}

```

## Images

An image can be a file or variable which stores the bitmap itself and some metadata.

### Enregistrer des images

Vous pouvez enregistrer des images à deux endroits

- en tant que variable en mémoire interne (MEV ou MEM)
- as a file

## Variables

The images stored internally in a variable is composed mainly of an `lv_img_dsc_t` structure with the following fields:

- header

- *cf* Format de couleur. Voir *ci-dessous*
- *w* largeur en pixels ( $\leq 2048$ )
- *h* hauteur en pixels ( $\leq 2048$ )
- *always zero* 3 bits qui doivent toujours être à zéro
- *reserved* réservé pour une utilisation future
- **datapointeur** sur un tableau où l' image elle-même est enregistrée
- **data\_size** length of **data** in bytes

These are usually stored within a project as C files. They are linked into the resulting executable like any other constant data.

## Fichiers

To deal with files you need to add a *Drive* to LittlevGL. In short, a *Drive* is a collection of functions (*open*, *read*, *close*, etc.) registered in LittlevGL to make file operations. You can add an interface to a standard file system (FAT32 on SD card) or you create your simple file system to read data from an SPI Flash memory. In every case, a *Drive* is just an abstraction to read and/or write data to a memory. See the *File system* section to learn more.

Images stored as files are not linked into the resulting executable, and must be read to RAM before being drawn. As a result, they are not as resource-friendly as variable images. However, they are easier to replace without needing to recompile the main program.

## Formats de couleur

Divers formats de couleur intégrés sont pris en charge:

- **LV\_IMG\_CF\_TRUE\_COLOR** Simply stores the RGB colors (in whatever color depth LittlevGL is configured for).
- **LV\_IMG\_CF\_TRUE\_COLOR\_ALPHA** Like **LV\_IMG\_CF\_TRUE\_COLOR** but it also adds an alpha (transparency) byte for every pixel.
- **LV\_IMG\_CF\_TRUE\_COLOR\_CHROMA\_KEYED** Like **LV\_IMG\_CF\_TRUE\_COLOR** but if a pixel has **LV\_COLOR\_TRANSP** (set in *lv\_conf.h*) color the pixel will be transparent.
- **LV\_IMG\_CF\_INDEXED\_1/2/4/8BIT** Uses a palette with 2, 4, 16 or 256 colors and stores each pixel in 1, 2, 4 or 8 bits.
- **LV\_IMG\_CF\_ALPHA\_1/2/4/8BIT** Only stores the Alpha value on 1, 2, 4 or 8 bits. The pixels take the color of **style.image.color** and the set opacity. The source image has to be an alpha channel. This is ideal for bitmaps similar to fonts (where the whole image is one color but you'd like to be able to change it).

The bytes of the **LV\_IMG\_CF\_TRUE\_COLOR** images are stored in the following order.

For 32-bit color depth:

- Byte 0: Bleu
- Byte 1: Vert
- Byte 2: Rouge
- Byte 3: Alpha

For 16-bit color depth:

- Byte 0: Green 3 lower bit, Blue 5 bit
- Byte 1: Rouge 5 bits, Vert 3 bits de poids fort
- Byte 2: octet Alpha (seulement avec `LV_IMG_CF_TRUE_COLOR_ALPHA`)

For 8-bit color depth:

- Byte 0: Rouge 3 bits, Vert 3 bits, Bleu 2 bits
- Byte 2: octet Alpha (seulement avec `LV_IMG_CF_TRUE_COLOR_ALPHA`)

You can store images in a *Raw* format to indicate that, it's not a built-in color format and an external *Image decoder* needs to be used to decode the image.

- **`LV_IMG_CF_RAW`** Indicates a basic raw image (e.g. a PNG or JPG image).
- **`LV_IMG_CF_RAW_ALPHA`** Indicates that the image has alpha and an alpha byte is added for every pixel.
- **`LV_IMG_CF_RAW_CHROME_KEYED`** Indicates that the image is chrome keyed as described in `LV_IMG_CF_TRUE_COLOR_CHROMA_KEYED` above.

## Ajouter et utiliser des images

Vous pouvez ajouter des images à LittlevGL de deux manières :

- using the online converter
- créer manuellement des images

## Convertisseur en ligne

The online Image converter is available here: <https://littlevgl.com/image-to-c-array>

Adding an image to LittlevGL via online converter is easy.

1. You need to select a *BMP*, *PNG* or *JPG* image first.
2. Give the image a name that will be used within LittlevGL.
3. Select the *Color format*.
4. Select the type of image you want. Choosing a binary will generate a **.bin** file that must be stored separately and read using the *file support*. Choosing a variable will generate a standard C file that can be linked into your project.
5. Hit the *Convert* button. Once the conversion is finished, your browser will automatically download the resulting file.

In the converter C arrays (variables), the bitmaps for all the color depths (1, 8, 16 or 32) are included in the C file, but only the color depth that matches `LV_COLOR_DEPTH` in *lv\_conf.h* will actually be linked into the resulting executable.

In case of binary files, you need to specify the color format you want:

- RGB332 for 8-bit color depth
- RGB565 for 16-bit color depth
- RGB565 Swap for 16-bit color depth (two bytes are swapped)

- RGB888 for 32-bit color depth

### Créer une image manuellement

If you are generating an image at run-time, you can craft an image variable to display it using LittlevGL. For example:

```
uint8_t my_img_data[] = {0x00, 0x01, 0x02, ...};

static lv_img_dsc_t my_img_dsc = {
    .header.always_zero = 0,
    .header.w = 80,
    .header.h = 60,
    .data_size = 80 * 60 * LV_COLOR_DEPTH / 8,
    .header.cf = LV_IMG_CF_TRUE_COLOR,      /* Définit le format de couleur */
    .data = my_img_data,
};
```

If the color format is `LV_IMG_CF_TRUE_COLOR_ALPHA` you can set `data_size` like `80 * 60 * LV_IMG_PX_SIZE_ALPHA_BYTE`.

Another (possibly simpler) option to create and display an image at run-time is to use the *Canvas* object.

### Utiliser des images

The simplest way to use an image in LittlevGL is to display it with an *lv\_img* object:

```
lv_obj_t * icon = lv_img_create(lv_scr_act(), NULL);

/* A partir d'une variable */
lv_img_set_src(icon, &my_icon_dsc);

/* A partir d'un fichier */
lv_img_set_src(icon, "S:my_icon.bin");
```

If the image was converted with the online converter, you should use `LV_IMG_DECLARE(my_icon_dsc)` to declare the image in the file where you want to use it.

### Décodeur d' images

As you can see in the *Color formats* section, LittlevGL supports several built-in image formats. In many cases, these will be all you need. LittlevGL doesn't directly support, however, generic image formats like PNG or JPG.

To handle non-built-in image formats, you need to use external libraries and attach them to LittlevGL via the *Image decoder* interface.

The image decoder consists of 4 callbacks:

- **info** get some basic info about the image (width, height and color format).
- **open** open the image: either store the decoded image or set it to `NULL` to indicate the image can be read line-by-line.
- **read** if *open* didn't fully open the image this function should give some decoded data (max 1 line) from a given position.

- **close** ferme l' image ouverte, libère les ressources allouées.

You can add any number of image decoders. When an image needs to be drawn, the library will try all the registered image decoder until finding one which can open the image, i.e. knowing that format.

The `LV_IMG_CF_TRUE_COLOR...`, `LV_IMG_INDEXED...` and `LV_IMG_ALPHA...` formats (essentially, all non-RAW formats) are understood by the built-in decoder.

### Formats d' image personnalisés

The easiest way to create a custom image is to use the online image converter and set **Raw**, **Raw with alpha** or **Raw with chrome keyed** format. It will just take every byte of the binary file you uploaded and write it as the image "bitmap". You then need to attach an image decoder that will parse that bitmap and generate the real, renderable bitmap.

`header.cf` will be `LV_IMG_CF_RAW`, `LV_IMG_CF_RAW_ALPHA` or `LV_IMG_CF_RAW_CHROME_KEYED` accordingly. You should choose the correct format according to your needs: fully opaque image, use alpha channel or use chroma keying.

After decoding, the *raw* formats are considered *True color* by the library. In other words, the image decoder must decode the *Raw* images to *True color* according to the format described in `[#color-formats](Color formats)` section.

If you want to create a custom image, you should use `LV_IMG_CF_USER_ENCODED_0..7` color formats. However, the library can draw the images only in *True color* format (or *Raw* but finally it' s supposed to be in *True color* format). So the `LV_IMG_CF_USER_ENCODED...` formats are not known by the library, therefore, they should be decoded to one of the known formats from `[#color-formats](Color formats)` section. It' s possible to decode the image to a non-true color format first, for example, `LV_IMG_INDEXED_4BITS`, and then call the built-in decoder functions to convert it to *True color*.

With *User encoded* formats, the color format in the open function (`dsc->header.cf`) should be changed according to the new format.

### Enregistrer un décodeur d' image

Here' s an example of getting LittlevGL to work with PNG images.

First, you need to create a new image decoder and set some functions to open/close the PNG files. It should looks like this:

```
/* Crée un nouveau décodeur et enregistre les fonctions */
lv_img_decoder_t * dec = lv_img_decoder_create();
lv_img_decoder_set_info_cb(dec, decoder_info);
lv_img_decoder_set_open_cb(dec, decoder_open);
lv_img_decoder_set_close_cb(dec, decoder_close);

/**
 * Obtient les informations sur une image PNG
 * @param decoder pointeur vers le décodeur auquel cette fonction appartient
 * @param src peut être un nom de fichier ou un pointeur sur un tableau C
 * @param header enregistre l'information ici
 * @return LV_RES_OK : pas d'erreur ; LV_RES_INV : impossible d'obtenir l'information
 */
static lv_res_t decoder_info(lv_img_decoder_t * decoder, const void * src, lv_img_header_t * header)
{
```

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```

/* Vérifie si le type `src` est connu du décodeur */
if(is_png(src) == false) return LV_RES_INV;

/* Read the PNG header and find `width` and `height` */
...

header->cf = LV_IMG_CF_RAW_ALPHA;
header->w = width;
header->h = height;
}

/**
 * Ouvre une image PNG et retourne l'image décodée
 * @param decoder pointeur vers le décodeur auquel cette fonction appartient
 * @param dsc pointeur sur le descripteur de cette session de décodage
 * @return LV_RES_OK : pas d'erreur ; LV_RES_INV : impossible d'obtenir l'information
 */
static lv_res_t decoder_open(lv_img_decoder_t * decoder, lv_img_decoder_dsc_t * dsc)
{
    /* Vérifie si le type `src` est connu du décodeur */
    if(is_png(src) == false) return LV_RES_INV;

    /*Decode and store the image. If `dsc->img_data` is `NULL`, the `read_line`
    ↪ function will be called to get the image data line-by-line*/
    dsc->img_data = my_png_decoder(src);

    /* Change le format de couleur si nécessaire. Pour le PNG, généralement un format
    ↪ 'brut' convient */
    dsc->header.cf = LV_IMG_CF_...

    /* Appelle une fonction de décodeur intégré si nécessaire. Ce n'est pas nécessaire
    ↪ si `my_png_decoder` a décodé l'image au format couleurs vraies. */
    lv_res_t res = lv_img_decoder_built_in_open(decoder, dsc);

    return res;
}

/**
 * Décode `len` pixels à partir des coordonnées fournies `x`, `y` et enregistre-les
    ↪ dans `buf`.
 * Requis uniquement si la fonction "open" ne peut pas décoder l'intégralité du
    ↪ tableau de pixels (dsc->img_data == NULL).
 * @param decoder pointeur vers le décodeur associé à la fonction
 * @param dsc pointeur vers le descripteur de décodeur
 * @param x coordonnée x de début
 * @param y coordonnée y de début
 * @param len nombre de pixels à décoder
 * @param buf un tampon pour enregistrer les pixels décodés
 * @return LV_RES_OK : ok ; LV_RES_INV : échec
 */
lv_res_t decoder_built_in_read_line(lv_img_decoder_t * decoder, lv_img_decoder_dsc_t
    ↪ * dsc, lv_coord_t x,
                                lv_coord_t y, lv_coord_t len, uint8_
    ↪ t * buf)
{

```

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```

    /* Avec PNG, ce n'est généralement pas nécessaire */

    /* Copie `len` pixels à partir des coordonnées `x` et `y` au format couleurs
    ↪ vraies dans `buf` */
}

/**
 * Libère les ressources allouées
 * @param decoder pointeur vers le décodeur auquel cette fonction appartient
 * @param dsc pointeur sur le descripteur de cette session de décodage
 */
static void decoder_close(lv_img_decoder_t * decoder, lv_img_decoder_dsc_t * dsc)
{
    /* Libère toutes les données allouées */

    /* Appelle la fonction intégrée de fermeture si les fonctions intégrées open/read_
    ↪ line ont été utilisées */
    lv_img_decoder_built_in_close(decoder, dsc);
}

```

Donc en résumé :

- In **decoder\_info**, you should collect some basic information about the image and store it in **header**.
- In **decoder\_open**, you should try to open the image source pointed by **dsc->src**. Its type is already in **dsc->src\_type == LV\_IMG\_SRC\_FILE/VARIABLE**. If this format/type is not supported by the decoder, return **LV\_RES\_INV**. However, if you can open the image, a pointer to the decoded *True color* image should be set in **dsc->img\_data**. If the format is known but, you don't want to decode while image (e.g. no memory for it) set **dsc->img\_data = NULL** to call **read\_line** to get the pixels.
- Dans **decoder\_close**, vous devez libérer toutes les ressources allouées.
- **decoder\_read** is optional. Decoding the whole image requires extra memory and some computational overhead. However, if can decode one line of the image without decoding the whole image, you can save memory and time. To indicate that, the *line read* function should be used, set **dsc->img\_data = NULL** in the open function.

### Utiliser manuellement un décodeur d' image

LittlevGL will use the registered image decoder automatically if you try and draw a raw image (i.e. using the **lv\_img** object) but you can use them manually too. Create a **lv\_img\_decoder\_dsc\_t** variable to describe the decoding session and call **lv\_img\_decoder\_open()**, **lv\_img\_decoder\_open()**.

```

lv_res_t res;
lv_img_decoder_dsc_t dsc;
res = lv_img_decoder_open(&dsc, &my_img_dsc, &lv_style_plain);

if(res == LV_RES_OK) {
    /* Faites quelque chose avec `dsc->img_data` */
    lv_img_decoder_close(&dsc);
}

```

## Mise en cache des images

Sometimes it takes a lot of time to open an image. Continuously decoding a PNG image or loading images from a slow external memory would be inefficient and detrimental to the user experience.

Therefore, LittlevGL caches a given number of images. Caching means some images will be left open, hence LittlevGL can quickly access them from `dsc->img_data` instead of needing to decode them again.

Of course, caching images is resource-intensive as it uses more RAM (to store the decoded image). LittlevGL tries to optimize the process as much as possible (see below), but you will still need to evaluate if this would be beneficial for your platform or not. If you have a deeply embedded target which decodes small images from a relatively fast storage medium, image caching may not be worth it.

## Taille du cache

The number of cache entries can be defined in `LV_IMG_CACHE_DEF_SIZE` in `lv_conf.h`. The default value is 1 so only the most recently used image will be left open.

The size of the cache can be changed at run-time with `lv_img_cache_set_size(entry_num)`.

## Valeur des images

When you use more images than cache entries, LittlevGL can't cache all of the images. Instead, the library will close one of the cached images (to free space).

To decide which image to close, LittlevGL uses a measurement it previously made of how long it took to open the image. Cache entries that hold slower-to-open images are considered more valuable and are kept in the cache as long as possible.

If you want or need to override LittlevGL's measurement, you can manually set the *time to open* value in the decoder open function in `dsc->time_to_open = time_ms` to give a higher or lower value. (Leave it unchanged to let LittlevGL set it.)

Every cache entry has a “*life*” value. Every time an image opening happens through the cache, the *life* of all entries are decreased to make them older. When a cached image is used, its *life* is increased by the *time to open* value to make it more alive.

If there is no more space in the cache, always the entry with the smallest life will be closed.

## Utilisation de la mémoire

Note that, the cached image might continuously consume memory. For example, if 3 PNG images are cached, they will consume memory while they are opened.

Therefore, it's the user's responsibility to be sure there is enough RAM to cache, even the largest images at the same time.

## Nettoyer le cache

Let's say you have loaded a PNG image into a `lv_img_dsc_t my_png` variable and use it in an `lv_img` object. If the image is already cached and you then change the underlying PNG file, you need to notify LittlevGL to cache the image again. Otherwise, there is no easy way of detecting that the underlying file changed and LittlevGL will still draw the old image.



To do this, use `lv_img_cache_invalidate_src(&my_png)`. If `NULL` is passed as a parameter, the whole cache will be cleaned.

## API

### Décodeur d' image

#### Typedefs

```
typedef uint8_t lv_img_src_t
```

```
typedef uint8_t lv_img_cf_t
```

```
typedef lv_res_t (*lv_img_decoder_info_f_t)(struct lv_img_decoder *decoder, const
                                             void *src, lv_img_header_t *header)
```

Get info from an image and store in the header

**Return** LV\_RES\_OK: info written correctly; LV\_RES\_INV: failed

#### Parameters

- **src**: the image source. Can be a pointer to a C array or a file name (Use `lv_img_src_get_type` to determine the type)
- **header**: store the info here

```
typedef lv_res_t (*lv_img_decoder_open_f_t)(struct lv_img_decoder *decoder,
                                             struct lv_img_decoder_dsc *dsc)
```

Open an image for decoding. Prepare it as it is required to read it later

#### Parameters

- **decoder**: pointer to the decoder the function associated with
- **dsc**: pointer to decoder descriptor. **src**, **style** are already initialized in it.

```
typedef lv_res_t (*lv_img_decoder_read_line_f_t)(struct lv_img_decoder *decoder,
                                                    struct lv_img_decoder_dsc
                                                    *dsc, lv_coord_t x, lv_coord_t y,
                                                    lv_coord_t len, uint8_t *buf)
```

Decode **len** pixels starting from the given **x**, **y** coordinates and store them in **buf**. Required only if the “open” function can’t return with the whole decoded pixel array.

**Return** LV\_RES\_OK: ok; LV\_RES\_INV: failed

#### Parameters

- **decoder**: pointer to the decoder the function associated with
- **dsc**: pointer to decoder descriptor
- **x**: start x coordinate
- **y**: start y coordinate
- **len**: number of pixels to decode
- **buf**: a buffer to store the decoded pixels

```
typedef void (*lv_img_decoder_close_f_t)(struct lv_img_decoder *decoder, struct
                                           lv_img_decoder_dsc *dsc)
```

Close the pending decoding. Free resources etc.

#### Parameters

- `decoder`: pointer to the decoder the function associated with
- `dsc`: pointer to decoder descriptor

**typedef struct `_lv_img_decoder` `lv_img_decoder_t`**

**typedef struct `_lv_img_decoder_dsc` `lv_img_decoder_dsc_t`**

Describe an image decoding session. Stores data about the decoding

## Enums

**enum [anonymous]**

Source of image.

*Values:*

**LV\_IMG\_SRC\_VARIABLE**

**LV\_IMG\_SRC\_FILE**

Binary/C variable

**LV\_IMG\_SRC\_SYMBOL**

File in filesystem

**LV\_IMG\_SRC\_UNKNOWN**

Symbol (`lv_symbol_def.h`)

**enum [anonymous]**

*Values:*

**LV\_IMG\_CF\_UNKNOWN = 0**

**LV\_IMG\_CF\_RAW**

Contains the file as it is. Needs custom decoder function

**LV\_IMG\_CF\_RAW\_ALPHA**

Contains the file as it is. The image has alpha. Needs custom decoder function

**LV\_IMG\_CF\_RAW\_CHROMA\_KEYED**

Contains the file as it is. The image is chroma keyed. Needs custom decoder function

**LV\_IMG\_CF\_TRUE\_COLOR**

Color format and depth should match with `LV_COLOR` settings

**LV\_IMG\_CF\_TRUE\_COLOR\_ALPHA**

Same as `LV_IMG_CF_TRUE_COLOR` but every pixel has an alpha byte

**LV\_IMG\_CF\_TRUE\_COLOR\_CHROMA\_KEYED**

Same as `LV_IMG_CF_TRUE_COLOR` but `LV_COLOR_TRANSP` pixels will be transparent

**LV\_IMG\_CF\_INDEXED\_1BIT**

Can have 2 different colors in a palette (always chroma keyed)

**LV\_IMG\_CF\_INDEXED\_2BIT**

Can have 4 different colors in a palette (always chroma keyed)

**LV\_IMG\_CF\_INDEXED\_4BIT**

Can have 16 different colors in a palette (always chroma keyed)

**LV\_IMG\_CF\_INDEXED\_8BIT**

Can have 256 different colors in a palette (always chroma keyed)

**LV\_IMG\_CF\_ALPHA\_1BIT**

Can have one color and it can be drawn or not

**LV\_IMG\_CF\_ALPHA\_2BIT**  
Can have one color but 4 different alpha value

**LV\_IMG\_CF\_ALPHA\_4BIT**  
Can have one color but 16 different alpha value

**LV\_IMG\_CF\_ALPHA\_8BIT**  
Can have one color but 256 different alpha value

**LV\_IMG\_CF\_RESERVED\_15**  
Reserved for further use.

**LV\_IMG\_CF\_RESERVED\_16**  
Reserved for further use.

**LV\_IMG\_CF\_RESERVED\_17**  
Reserved for further use.

**LV\_IMG\_CF\_RESERVED\_18**  
Reserved for further use.

**LV\_IMG\_CF\_RESERVED\_19**  
Reserved for further use.

**LV\_IMG\_CF\_RESERVED\_20**  
Reserved for further use.

**LV\_IMG\_CF\_RESERVED\_21**  
Reserved for further use.

**LV\_IMG\_CF\_RESERVED\_22**  
Reserved for further use.

**LV\_IMG\_CF\_RESERVED\_23**  
Reserved for further use.

**LV\_IMG\_CF\_USER\_ENCODED\_0**  
User holder encoding format.

**LV\_IMG\_CF\_USER\_ENCODED\_1**  
User holder encoding format.

**LV\_IMG\_CF\_USER\_ENCODED\_2**  
User holder encoding format.

**LV\_IMG\_CF\_USER\_ENCODED\_3**  
User holder encoding format.

**LV\_IMG\_CF\_USER\_ENCODED\_4**  
User holder encoding format.

**LV\_IMG\_CF\_USER\_ENCODED\_5**  
User holder encoding format.

**LV\_IMG\_CF\_USER\_ENCODED\_6**  
User holder encoding format.

**LV\_IMG\_CF\_USER\_ENCODED\_7**  
User holder encoding format.

## Functions

void **lv\_img\_decoder\_init**(void)

Initialize the image decoder module

lv\_res\_t **lv\_img\_decoder\_get\_info**(const char \*src, lv\_img\_header\_t \*header)

Get information about an image. Try the created image decoder one by one. Once one is able to get info that info will be used.

**Return** LV\_RES\_OK: success; LV\_RES\_INV: wasn't able to get info about the image

### Parameters

- **src**: the image source. Can be 1) File name: E.g. "S:folder/img1.png" (The drivers needs to registered via `lv_fs_add_drv()`) 2) Variable: Pointer to an `lv_img_dsc_t` variable 3) Symbol: E.g. LV\_SYMBOL\_OK
- **header**: the image info will be stored here

lv\_res\_t **lv\_img\_decoder\_open**(lv\_img\_decoder\_dsc\_t \*dsc, const void \*src, const lv\_style\_t \*style)

Open an image. Try the created image decoder one by one. Once one is able to open the image that decoder is save in **dsc**

**Return** LV\_RES\_OK: opened the image. **dsc->img\_data** and **dsc->header** are set.  
LV\_RES\_INV: none of the registered image decoders were able to open the image.

### Parameters

- **dsc**: describe a decoding session. Simply a pointer to an `lv_img_decoder_dsc_t` variable.
- **src**: the image source. Can be 1) File name: E.g. "S:folder/img1.png" (The drivers needs to registered via `lv_fs_add_drv()`) 2) Variable: Pointer to an `lv_img_dsc_t` variable 3) Symbol: E.g. LV\_SYMBOL\_OK
- **style**: the style of the image

lv\_res\_t **lv\_img\_decoder\_read\_line**(lv\_img\_decoder\_dsc\_t \*dsc, lv\_coord\_t x, lv\_coord\_t y, lv\_coord\_t len, uint8\_t \*buf)

Read a line from an opened image

**Return** LV\_RES\_OK: success; LV\_RES\_INV: an error occurred

### Parameters

- **dsc**: pointer to `lv_img_decoder_dsc_t` used in `lv_img_decoder_open`
- **x**: start X coordinate (from left)
- **y**: start Y coordinate (from top)
- **len**: number of pixels to read
- **buf**: store the data here

void **lv\_img\_decoder\_close**(lv\_img\_decoder\_dsc\_t \*dsc)

Close a decoding session

### Parameters

- **dsc**: pointer to `lv_img_decoder_dsc_t` used in `lv_img_decoder_open`

lv\_img\_decoder\_t \***lv\_img\_decoder\_create**(void)

Create a new image decoder

**Return** pointer to the new image decoder

void **lv\_img\_decoder\_delete**(*lv\_img\_decoder\_t* \*decoder)

Delete an image decoder

#### Parameters

- **decoder**: pointer to an image decoder

void **lv\_img\_decoder\_set\_info\_cb**(*lv\_img\_decoder\_t* \*decoder, *lv\_img\_decoder\_info\_f\_t* info\_cb)

Set a callback to get information about the image

#### Parameters

- **decoder**: pointer to an image decoder
- **info\_cb**: a function to collect info about an image (fill an *lv\_img\_header\_t* struct)

void **lv\_img\_decoder\_set\_open\_cb**(*lv\_img\_decoder\_t* \*decoder, *lv\_img\_decoder\_open\_f\_t* open\_cb)

Set a callback to open an image

#### Parameters

- **decoder**: pointer to an image decoder
- **open\_cb**: a function to open an image

void **lv\_img\_decoder\_set\_read\_line\_cb**(*lv\_img\_decoder\_t* \*decoder, *lv\_img\_decoder\_read\_line\_f\_t* read\_line\_cb)

Set a callback to a decoded line of an image

#### Parameters

- **decoder**: pointer to an image decoder
- **read\_line\_cb**: a function to read a line of an image

void **lv\_img\_decoder\_set\_close\_cb**(*lv\_img\_decoder\_t* \*decoder, *lv\_img\_decoder\_close\_f\_t* close\_cb)

Set a callback to close a decoding session. E.g. close files and free other resources.

#### Parameters

- **decoder**: pointer to an image decoder
- **close\_cb**: a function to close a decoding session

lv\_res\_t **lv\_img\_decoder\_built\_in\_info**(*lv\_img\_decoder\_t* \*decoder, **const** void \*src, *lv\_img\_header\_t* \*header)

Get info about a built-in image

**Return** LV\_RES\_OK: the info is successfully stored in **header**; LV\_RES\_INV: unknown format or other error.

#### Parameters

- **decoder**: the decoder where this function belongs
- **src**: the image source: pointer to an *lv\_img\_dsc\_t* variable, a file path or a symbol
- **header**: store the image data here

lv\_res\_t **lv\_img\_decoder\_built\_in\_open**(*lv\_img\_decoder\_t* \*decoder, *lv\_img\_decoder\_dsc\_t* \*dsc)

Open a built in image

**Return** LV\_RES\_OK: the info is successfully stored in **header**; LV\_RES\_INV: unknown format or other error.

### Parameters

- **decoder**: the decoder where this function belongs
- **dsc**: pointer to decoder descriptor. **src**, **style** are already initialized in it.

```
lv_res_t lv_img_decoder_built_in_read_line(lv_img_decoder_t *decoder,
                                           lv_img_decoder_dsc_t *dsc, lv_coord_t
                                           x, lv_coord_t y, lv_coord_t len, uint8_t
                                           *buf)
```

Decode **len** pixels starting from the given **x**, **y** coordinates and store them in **buf**. Required only if the “open” function can’t return with the whole decoded pixel array.

**Return** LV\_RES\_OK: ok; LV\_RES\_INV: failed

### Parameters

- **decoder**: pointer to the decoder the function associated with
- **dsc**: pointer to decoder descriptor
- **x**: start x coordinate
- **y**: start y coordinate
- **len**: number of pixels to decode
- **buf**: a buffer to store the decoded pixels

```
void lv_img_decoder_built_in_close(lv_img_decoder_t *decoder, lv_img_decoder_dsc_t
                                  *dsc)
```

Close the pending decoding. Free resources etc.

### Parameters

- **decoder**: pointer to the decoder the function associated with
- **dsc**: pointer to decoder descriptor

**struct lv\_img\_header\_t**

*#include <lv\_img\_decoder.h>* LittlevGL image header

### Public Members

uint32\_t **cf**

uint32\_t **always\_zero**

uint32\_t **reserved**

uint32\_t **w**

uint32\_t **h**

**struct lv\_img\_dsc\_t**

*#include <lv\_img\_decoder.h>* Image header it is compatible with the result from image converter utility

### Public Members

*lv\_img\_header\_t* **header**

uint32\_t **data\_size**

```

    const uint8_t *data
struct _lv_img_decoder

```

#### Public Members

```

    lv_img_decoder_info_f_t info_cb
    lv_img_decoder_open_f_t open_cb
    lv_img_decoder_read_line_f_t read_line_cb
    lv_img_decoder_close_f_t close_cb
    lv_img_decoder_user_data_t user_data

```

```

struct _lv_img_decoder_dsc

```

*#include <lv\_img\_decoder.h>* Describe an image decoding session. Stores data about the decoding

#### Public Members

```

    lv_img_decoder_t *decoder
    The decoder which was able to open the image source

    const void *src
    The image source. A file path like "S:my_img.png" or pointer to an lv_img_dsc_t variable

    const lv_style_t *style
    Style to draw the image.

    lv_img_src_t src_type
    Type of the source: file or variable. Can be set in open function if required

    lv_img_header_t header
    Info about the opened image: color format, size, etc. MUST be set in open function

    const uint8_t *img_data
    Pointer to a buffer where the image's data (pixels) are stored in a decoded, plain format. MUST be set in open function

    uint32_t time_to_open
    How much time did it take to open the image. [ms] If not set lv_img_cache will measure and set the time to open

    const char *error_msg
    A text to display instead of the image when the image can't be opened. Can be set in open function or set NULL.

    void *user_data
    Store any custom data here is required

```

### Cache d' images

#### Functions

```

lv_img_cache_entry_t *lv_img_cache_open(const void *src, const lv_style_t *style)

```

Open an image using the image decoder interface and cache it. The image will be left open meaning if the image decoder open callback allocated memory then it will remain. The image is closed if a new image is opened and the new image takes its place in the cache.

**Return** pointer to the cache entry or NULL if can open the image

#### Parameters

- **src**: source of the image. Path to file or pointer to an `lv_img_dsc_t` variable
- **style**: style of the image

void **lv\_img\_cache\_set\_size**(uint16\_t *new\_slot\_num*)

Set the number of images to be cached. More cached images mean more opened image at same time which might mean more memory usage. E.g. if 20 PNG or JPG images are open in the RAM they consume memory while opened in the cache.

#### Parameters

- **new\_entry\_cnt**: number of image to cache

void **lv\_img\_cache\_invalidate\_src**(const void \**src*)

Invalidate an image source in the cache. Useful if the image source is updated therefore it needs to be cached again.

#### Parameters

- **src**: an image source path to a file or pointer to an `lv_img_dsc_t` variable.

**struct lv\_img\_cache\_entry\_t**

`#include <lv_img_cache.h>` When loading images from the network it can take a long time to download and decode the image.

To avoid repeating this heavy load images can be cached.

#### Public Members

`lv_img_decoder_dsc_t` **dec\_dsc**

Image information

int32\_t **life**

Count the cache entries' s life. Add `time_tio_open` to `life` when the entry is used. Decrement all lifes by one every in every `lv_img_cache_open`. If `life == 0` the entry can be reused

## Système de fichiers

LittlevGL has a 'File system' abstraction module that enables you to attach any type of file systems. The file system is identified by a drive letter. For example, if the SD card is associated with the letter 'S', a file can be reached like "S:path/to/file.txt".

## Ajouter un pilote

To add a driver, `lv_fs_drv_t` needs to be initialized like this:

```
lv_fs_drv_t drv;
lv_fs_drv_init(&drv);                                /* Initialisation de base */

drv.letter = 'S';                                     /* Une lettre majuscule pour identifier le_
↳lecteur */
drv.file_size = sizeof(my_file_object);               /* Taille requise pour enregistrer un objet_
↳de fichier */
drv.rddir_size = sizeof(my_dir_object);               /*Size required to store a directory object_
↳(used by dir_open/close/read)*/
```

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```

drv.ready_cb = my_ready_cb;          /* Fonction de rappel pour indiquer si le
↳lecteur est prêt à être utilisé */
drv.open_cb = my_open_cb;            /* Fonction de rappel pour ouvrir un
↳fichier */
drv.close_cb = my_close_cb;          /* Fonction de rappel pour fermer un
↳fichier */
drv.read_cb = my_read_cb;            /* Fonction de rappel pour lire un fichier
↳ */
drv.write_cb = my_write_cb;          /* Fonction de rappel pour écrire un
↳fichier */
drv.seek_cb = my_seek_cb;            /* Fonction de rappel pour se déplacer dans
↳un fichier (déplacer le curseur) */
drv.tell_cb = my_tell_cb;            /* Fonction de rappel pour donner la
↳position du curseur */
drv.trunc_cb = my_trunc_cb;          /* Fonction de rappel pour supprimer un
↳fichier */
drv.size_cb = my_size_cb;            /* Fonction de rappel pour donner la taille
↳d'un fichier */
drv.rename_cb = my_size_cb;          /* Fonction de rappel pour renommer un
↳fichier */

drv.dir_open_cb = my_dir_open_cb;    /* Fonction de rappel pour ouvrir un
↳répertoire et lire son contenu */
drv.dir_read_cb = my_dir_read_cb;    /* Fonction de rappel pour lire le contenu d
↳'un répertoire */
drv.dir_close_cb = my_dir_close_cb;  /* Fonction de rappel pour fermer un
↳répertoire */

drv.free_space_cb = my_size_cb;       /* Fonction de rappel pour donner l'espace
↳libre d'un lecteur */

drv.user_data = my_user_data;        /* Toute donnée personnalisée si nécessaire
↳ */

lv_fs_drv_register(&drv);            /* Finalement enregistre le lecteur */

```

Any of the callbacks can be **NULL** to indicate that that operation is not supported.

As an example of how the callbacks are used, if you use `lv_fs_open(&file, "S:/folder/file.txt", LV_FS_MODE_WR)`, LittlevGL:

1. Verifies that a registered drive exists with the letter 'S'.
2. Checks if it's `open_cb` is implemented (not **NULL**).
3. Calls the set `open_cb` with "folder/file.txt" path.

### Exemple d' utilisation

L' exemple ci-dessous montre comment lire à partir d' un fichier :

```

lv_fs_file_t f;
lv_fs_res_t res;
res = lv_fs_open(&f, "S:folder/file.txt", LV_FS_MODE_RD);
if(res != LV_FS_RES_OK) my_error_handling();

```

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```
uint32_t read_num;
uint8_t buf[8];
res = lv_fs_read(&f, buf, 8, &read_num);
if(res != LV_FS_RES_OK || read_num != 8) my_error_handling();

lv_fs_close(&f);
```

*Le mode dans `lv_fs_open` peut être `LV_FS_MODE_WR` pour ouvrir en écriture ou `LV_FS_MODE_RD` | `LV_FS_MODE_WR` pour lecture/écriture*

This example shows how to read a directory's content. It's up to the driver how to mark the directories, but it can be a good practice to insert a '/' in front of the directory name.

```
lv_fs_dir_t dir;
lv_fs_res_t res;
res = lv_fs_dir_open(&dir, "S:/folder");
if(res != LV_FS_RES_OK) my_error_handling();

char fn[256];
while(1) {
    res = lv_fs_dir_read(&dir, fn);
    if(res != LV_FS_RES_OK) {
        my_error_handling();
        break;
    }

    /*fn is empty, if not more files to read*/
    if(strlen(fn) == 0) {
        break;
    }

    printf("%s\n", fn);
}

lv_fs_dir_close(&dir);
```

## Utiliser les pilotes pour les images

*Image* objects can be opened from files too (besides variables stored in the flash).

To initialize the image, the following callbacks are required:

- open
- close
- read
- seek
- tell

## API

## Typedefs

```
typedef uint8_t lv_fs_res_t
typedef uint8_t lv_fs_mode_t
typedef struct _lv_fs_drv_t lv_fs_drv_t
```

## Enums

**enum** [anonymous]  
Errors in the filesystem module.

*Values:*

```
LV_FS_RES_OK = 0
LV_FS_RES_HW_ERR
LV_FS_RES_FS_ERR
LV_FS_RES_NOT_EX
LV_FS_RES_FULL
LV_FS_RES_LOCKED
LV_FS_RES_DENIED
LV_FS_RES_BUSY
LV_FS_RES_TOUT
LV_FS_RES_NOT_IMP
LV_FS_RES_OUT_OF_MEM
LV_FS_RES_INV_PARAM
LV_FS_RES_UNKNOWN
```

**enum** [anonymous]  
Filesystem mode.

*Values:*

```
LV_FS_MODE_WR = 0x01
LV_FS_MODE_RD = 0x02
```

## Functions

void **lv\_fs\_init**(void)  
Initialize the File system interface

void **lv\_fs\_drv\_init**(lv\_fs\_drv\_t \*drv)  
Initialize a file system driver with default values. It is used to surly have known values in the fields ant not memory junk. After it you can set the fields.

### Parameters

- **drv**: pointer to driver variable to initialize

void **lv\_fs\_drv\_register**(*lv\_fs\_drv\_t* \*drv\_p)

Add a new drive

**Parameters**

- **drv\_p**: pointer to an *lv\_fs\_drv\_t* structure which is initied with the corresponding function pointers. The data will be copied so the variable can be local.

*lv\_fs\_drv\_t* \***lv\_fs\_get\_drv**(char letter)

Give a pointer to a driver from its letter

**Return** pointer to a driver or NULL if not found

**Parameters**

- **letter**: the driver letter

bool **lv\_fs\_is\_ready**(char letter)

Test if a drive is rady or not. If the **ready** function was not initialized **true** will be returned.

**Return** true: drive is ready; false: drive is not ready

**Parameters**

- **letter**: letter of the drive

*lv\_fs\_res\_t* **lv\_fs\_open**(*lv\_fs\_file\_t* \*file\_p, const char \*path, *lv\_fs\_mode\_t* mode)

Open a file

**Return** LV\_FS\_RES\_OK or any error from *lv\_fs\_res\_t* enum

**Parameters**

- **file\_p**: pointer to a *lv\_fs\_file\_t* variable
- **path**: path to the file beginning with the driver letter (e.g. S:/folder/file.txt)
- **mode**: read: FS\_MODE\_RD, write: FS\_MODE\_WR, both: FS\_MODE\_RD | FS\_MODE\_WR

*lv\_fs\_res\_t* **lv\_fs\_close**(*lv\_fs\_file\_t* \*file\_p)

Close an already opened file

**Return** LV\_FS\_RES\_OK or any error from *lv\_fs\_res\_t* enum

**Parameters**

- **file\_p**: pointer to a *lv\_fs\_file\_t* variable

*lv\_fs\_res\_t* **lv\_fs\_remove**(const char \*path)

Delete a file

**Return** LV\_FS\_RES\_OK or any error from *lv\_fs\_res\_t* enum

**Parameters**

- **path**: path of the file to delete

*lv\_fs\_res\_t* **lv\_fs\_read**(*lv\_fs\_file\_t* \*file\_p, void \*buf, uint32\_t btr, uint32\_t \*br)

Read from a file

**Return** LV\_FS\_RES\_OK or any error from *lv\_fs\_res\_t* enum

**Parameters**

- **file\_p**: pointer to a *lv\_fs\_file\_t* variable
- **buf**: pointer to a buffer where the read bytes are stored

- **btr**: Bytes To Read
- **br**: the number of real read bytes (Bytes Read). NULL if unused.

*lv\_fs\_res\_t* **lv\_fs\_write**(*lv\_fs\_file\_t* \**file\_p*, **const** void \**buf*, uint32\_t *btw*, uint32\_t \**bw*)  
Write into a file

**Return** LV\_FS\_RES\_OK or any error from *lv\_fs\_res\_t* enum

**Parameters**

- **file\_p**: pointer to a *lv\_fs\_file\_t* variable
- **buf**: pointer to a buffer with the bytes to write
- **btr**: Bytes To Write
- **br**: the number of real written bytes (Bytes Written). NULL if unused.

*lv\_fs\_res\_t* **lv\_fs\_seek**(*lv\_fs\_file\_t* \**file\_p*, uint32\_t *pos*)  
Set the position of the ‘cursor’ (read write pointer) in a file

**Return** LV\_FS\_RES\_OK or any error from *lv\_fs\_res\_t* enum

**Parameters**

- **file\_p**: pointer to a *lv\_fs\_file\_t* variable
- **pos**: the new position expressed in bytes index (0: start of file)

*lv\_fs\_res\_t* **lv\_fs\_tell**(*lv\_fs\_file\_t* \**file\_p*, uint32\_t \**pos*)  
Give the position of the read write pointer

**Return** LV\_FS\_RES\_OK or any error from ‘fs\_res\_t’

**Parameters**

- **file\_p**: pointer to a *lv\_fs\_file\_t* variable
- **pos\_p**: pointer to store the position of the read write pointer

*lv\_fs\_res\_t* **lv\_fs\_trunc**(*lv\_fs\_file\_t* \**file\_p*)  
Truncate the file size to the current position of the read write pointer

**Return** LV\_FS\_RES\_OK: no error, the file is read any error from *lv\_fs\_res\_t* enum

**Parameters**

- **file\_p**: pointer to an ‘ufs\_file\_t’ variable. (opened with *lv\_fs\_open* )

*lv\_fs\_res\_t* **lv\_fs\_size**(*lv\_fs\_file\_t* \**file\_p*, uint32\_t \**size*)  
Give the size of a file bytes

**Return** LV\_FS\_RES\_OK or any error from *lv\_fs\_res\_t* enum

**Parameters**

- **file\_p**: pointer to a *lv\_fs\_file\_t* variable
- **size**: pointer to a variable to store the size

*lv\_fs\_res\_t* **lv\_fs\_rename**(**const** char \**oldname*, **const** char \**newname*)  
Rename a file

**Return** LV\_FS\_RES\_OK or any error from ‘fs\_res\_t’

**Parameters**

- **oldname**: path to the file

- **newname**: path with the new name

*lv\_fs\_res\_t* **lv\_fs\_dir\_open**(*lv\_fs\_dir\_t* \**rddir\_p*, **const** char \**path*)

Initialize a ‘fs\_dir\_t’ variable for directory reading

**Return** LV\_FS\_RES\_OK or any error from lv\_fs\_res\_t enum

**Parameters**

- **rddir\_p**: pointer to a ‘fs\_read\_dir\_t’ variable
- **path**: path to a directory

*lv\_fs\_res\_t* **lv\_fs\_dir\_read**(*lv\_fs\_dir\_t* \**rddir\_p*, char \**fn*)

Read the next filename form a directory. The name of the directories will begin with ‘/’

**Return** LV\_FS\_RES\_OK or any error from lv\_fs\_res\_t enum

**Parameters**

- **rddir\_p**: pointer to an initialized ‘fs\_rdir\_t’ variable
- **fn**: pointer to a buffer to store the filename

*lv\_fs\_res\_t* **lv\_fs\_dir\_close**(*lv\_fs\_dir\_t* \**rddir\_p*)

Close the directory reading

**Return** LV\_FS\_RES\_OK or any error from lv\_fs\_res\_t enum

**Parameters**

- **rddir\_p**: pointer to an initialized ‘fs\_dir\_t’ variable

*lv\_fs\_res\_t* **lv\_fs\_free\_space**(char *letter*, uint32\_t \**total\_p*, uint32\_t \**free\_p*)

Get the free and total size of a driver in kB

**Return** LV\_FS\_RES\_OK or any error from lv\_fs\_res\_t enum

**Parameters**

- **letter**: the driver letter
- **total\_p**: pointer to store the total size [kB]
- **free\_p**: pointer to store the free size [kB]

char \***lv\_fs\_get\_letters**(char \**buf*)

Fill a buffer with the letters of existing drivers

**Return** the buffer

**Parameters**

- **buf**: buffer to store the letters ( ‘\0’ added after the last letter)

**const** char \***lv\_fs\_get\_ext**(**const** char \**fn*)

Return with the extension of the filename

**Return** pointer to the beginning extension or empty string if no extension

**Parameters**

- **fn**: string with a filename

char \***lv\_fs\_up**(char \**path*)

Step up one level

**Return** the truncated file name

## Parameters

- **path**: pointer to a file name

**const** char \***lv\_fs\_get\_last**(**const** char \**path*)

Get the last element of a path (e.g. U:/folder/file -> file)

**Return** pointer to the beginning of the last element in the path

## Parameters

- **buf**: buffer to store the letters ( ‘\0’ added after the last letter)

**struct** **\_lv\_fs\_drv\_t**

## Public Members

char **letter**

uint16\_t **file\_size**

uint16\_t **rddir\_size**

bool (\***ready\_cb**)(**struct** *\_lv\_fs\_drv\_t* \*drv)

*lv\_fs\_res\_t* (\***open\_cb**)(**struct** *\_lv\_fs\_drv\_t* \*drv, void \*file\_p, **const** char \*path, *lv\_fs\_mode\_t* mode)

*lv\_fs\_res\_t* (\***close\_cb**)(**struct** *\_lv\_fs\_drv\_t* \*drv, void \*file\_p)

*lv\_fs\_res\_t* (\***remove\_cb**)(**struct** *\_lv\_fs\_drv\_t* \*drv, **const** char \*fn)

*lv\_fs\_res\_t* (\***read\_cb**)(**struct** *\_lv\_fs\_drv\_t* \*drv, void \*file\_p, void \*buf, uint32\_t btr, uint32\_t \*br)

*lv\_fs\_res\_t* (\***write\_cb**)(**struct** *\_lv\_fs\_drv\_t* \*drv, void \*file\_p, **const** void \*buf, uint32\_t btw, uint32\_t \*bw)

*lv\_fs\_res\_t* (\***seek\_cb**)(**struct** *\_lv\_fs\_drv\_t* \*drv, void \*file\_p, uint32\_t pos)

*lv\_fs\_res\_t* (\***tell\_cb**)(**struct** *\_lv\_fs\_drv\_t* \*drv, void \*file\_p, uint32\_t \*pos\_p)

*lv\_fs\_res\_t* (\***trunc\_cb**)(**struct** *\_lv\_fs\_drv\_t* \*drv, void \*file\_p)

*lv\_fs\_res\_t* (\***size\_cb**)(**struct** *\_lv\_fs\_drv\_t* \*drv, void \*file\_p, uint32\_t \*size\_p)

*lv\_fs\_res\_t* (\***rename\_cb**)(**struct** *\_lv\_fs\_drv\_t* \*drv, **const** char \*oldname, **const** char \*newname)

*lv\_fs\_res\_t* (\***free\_space\_cb**)(**struct** *\_lv\_fs\_drv\_t* \*drv, uint32\_t \*total\_p, uint32\_t \*free\_p)

*lv\_fs\_res\_t* (\***dir\_open\_cb**)(**struct** *\_lv\_fs\_drv\_t* \*drv, void \*rddir\_p, **const** char \*path)

*lv\_fs\_res\_t* (\***dir\_read\_cb**)(**struct** *\_lv\_fs\_drv\_t* \*drv, void \*rddir\_p, char \*fn)

*lv\_fs\_res\_t* (\***dir\_close\_cb**)(**struct** *\_lv\_fs\_drv\_t* \*drv, void \*rddir\_p)

*lv\_fs\_drv\_user\_data\_t* **user\_data**

Custom file user data

**struct** **lv\_fs\_file\_t**

## Public Members

```
void *file_d
lv_fs_drv_t *drv
struct lv_fs_dir_t
```

## Public Members

```
void *dir_d
lv_fs_drv_t *drv
```

## Animations

You can automatically change the value of a variable between a start and an end value using animations. L'animation est réalisée par l'appel périodique d'une fonction "animateur" avec comme paramètre la valeur correspondante.

La fonction "animateur" a la signature suivante :

```
void func(void * var, lv_anim_var_t value);
```

Cette signature est compatible avec la plupart des fonctions *set* de LittlevGL. Par exemple `lv_obj_set_x(obj, value)` ou `lv_obj_set_width(obj, value)`

## Créer une animation

Pour créer une animation, une variable `lv_anim_t` doit être initialisée et configurée avec les fonctions `lv_anim_set_...()`.

```
lv_anim_t a;
lv_anim_set_exec_cb(&a, btn1, lv_obj_set_x);    /*Set the animator function and
↳variable to animate*/
lv_anim_set_time(&a, duration, delay);
lv_anim_set_values(&a, start, end);              /* Définit les valeurs initiale et
↳finale. P. ex. 0, 150 */
lv_anim_set_path_cb(&a, lv_anim_path_linear);    /* Définit le chemin à partir d'une
↳des fonctions `lv_anim_path_...` ou d'une fonction spécifique. */
lv_anim_set_ready_cb(&a, ready_cb);              /* Définit une fonction de rappel à
↳exécuter quand l'animation est prête (optionnel). */
lv_anim_set_playback(&a, wait_time);            /* Active le déroulé de l'animation
↳après un délai `wait_time` */
lv_anim_set_repeat(&a, wait_time);              /* Active la répétition d'une
↳animation après un délai `wait_time`. Peut être associé à la fonction `lv_anim_set_
↳playback` */
lv_anim_create(&a);                             /* Débute l'animation */
```

You can apply **multiple different animations** on the same variable at the same time. For example, animate the x and y coordinates with `lv_obj_set_x` and `lv_obj_set_y`. However, only one animation can exist with a given variable and function pair. Therefore `lv_anim_create()` will delete the already existing variable-function animations.



## Chemin d' animation

You can determinate the **path of animation**. In the most simple case, it is linear, which means the current value between *start* and *end* is changed linearly. A *path* is a function which calculates the next value to set based on the current state of the animation. Currently, there are the following built-in paths:

- `lv_anim_path_linear` animation linéaire
- `lv_anim_path_step` change en une seule fois à la fin
- `lv_anim_path_ease_in` lent au début
- `lv_anim_path_ease_out` lent à la fin
- `lv_anim_path_ease_in_out` lent au début et à la fin
- `lv_anim_path_overshoot` dépasse la valeur finale
- `lv_anim_path_bounce` bounce back a little from the end value (like hitting a wall)

## Vitesse et durée

By default, you can set the animation time. But, in some cases, the **animation speed** is more practical.

The `lv_anim_speed_to_time(speed, start, end)` function calculates the required time in milliseconds to reach the end value from a start value with the given speed. The speed is interpreted in *unit/sec* dimension. For example, `lv_anim_speed_to_time(20,0,100)` will give 5000 milliseconds. For example, in case of `lv_obj_set_x` *unit* is pixels so *20* means *20 px/sec* speed.

## Supprimer des animations

Vous pouvez **supprimer une animation** par `lv_anim_del(var, func)` en indiquant la variable animée et sa fonction animateur.

## API

### Périphérique d' entrée

#### Typedefs

```
typedef uint8_t lv_anim_enable_t
```

```
typedef lv_coord_t lv_anim_value_t
```

Type of the animated value

```
typedef void (*lv_anim_exec_xcb_t)(void *, lv_anim_value_t)
```

Generic prototype of “animator” functions. First parameter is the variable to animate. Second parameter is the value to set. Compatible with `lv_xxx_set_yyy(obj, value)` functions The `x` in `_xcb_t` means its not a fully generic prototype because it doesn't receive `lv_anim_t *` as its first argument

```
typedef void (*lv_anim_custom_exec_cb_t)(struct _lv_anim_t *, lv_anim_value_t)
```

Same as `lv_anim_exec_xcb_t` but receives `lv_anim_t *` as the first parameter. It's more consistent but less convenient. Might be used by binding generator functions.

**typedef** *lv\_anim\_value\_t* (\***lv\_anim\_path\_cb\_t**)(const struct *\_\_lv\_anim\_t* \*)

Get the current value during an animation

**typedef** void (\***lv\_anim\_ready\_cb\_t**)(struct *\_\_lv\_anim\_t* \*)

Callback to call when the animation is ready

**typedef struct** *\_\_lv\_anim\_t* **lv\_anim\_t**

Describes an animation

## Enums

**enum** [anonymous]

Can be used to indicate if animations are enabled or disabled in a case

*Values:*

**LV\_ANIM\_OFF**

**LV\_ANIM\_ON**

## Functions

void **lv\_anim\_core\_init**(void)

Init. the animation module

void **lv\_anim\_init**(*lv\_anim\_t* \*a)

Initialize an animation variable. E.g.: *lv\_anim\_t* a; **lv\_anim\_init**(&a); **lv\_anim\_set\_...**(&a);  
**lv\_anim\_create**(&a);

### Parameters

- **a**: pointer to an *lv\_anim\_t* variable to initialize

**static** void **lv\_anim\_set\_exec\_cb**(*lv\_anim\_t* \*a, void \*var, *lv\_anim\_exec\_xcb\_t* exec\_cb)

Set a variable to animate function to execute on **var**

### Parameters

- **a**: pointer to an initialized *lv\_anim\_t* variable
- **var**: pointer to a variable to animate
- **exec\_cb**: a function to execute. LittlevGL's built-in functions can be used. E.g. **lv\_obj\_set\_x**

**static** void **lv\_anim\_set\_time**(*lv\_anim\_t* \*a, uint16\_t duration, int16\_t delay)

Set the duration and delay of an animation

### Parameters

- **a**: pointer to an initialized *lv\_anim\_t* variable
- **duration**: duration of the animation in milliseconds
- **delay**: delay before the animation in milliseconds

**static** void **lv\_anim\_set\_values**(*lv\_anim\_t* \*a, *lv\_anim\_value\_t* start, *lv\_anim\_value\_t* end)

Set the start and end values of an animation

### Parameters

- **a**: pointer to an initialized *lv\_anim\_t* variable

- **start**: the start value
- **end**: the end value

**static void lv\_anim\_set\_custom\_exec\_cb**(*lv\_anim\_t* \*a, *lv\_anim\_custom\_exec\_cb\_t* *exec\_cb*)

Similar to `lv_anim_set_var_and_cb` but `lv_anim_custom_exec_cb_t` receives `lv_anim_t *` as its first parameter instead of `void *`. This function might be used when LittlevGL is binded to other languages because it's more consistent to have `lv_anim_t *` as first parameter.

#### Parameters

- **a**: pointer to an initialized `lv_anim_t` variable
- **exec\_cb**: a function to execute.

**static void lv\_anim\_set\_path\_cb**(*lv\_anim\_t* \*a, *lv\_anim\_path\_cb\_t* *path\_cb*)

Set the path (curve) of the animation.

#### Parameters

- **a**: pointer to an initialized `lv_anim_t` variable
- **path\_cb**: a function the get the current value of the animation. The built in functions starts with `lv_anim_path...`

**static void lv\_anim\_set\_ready\_cb**(*lv\_anim\_t* \*a, *lv\_anim\_ready\_cb\_t* *ready\_cb*)

Set a function call when the animation is ready

#### Parameters

- **a**: pointer to an initialized `lv_anim_t` variable
- **ready\_cb**: a function call when the animation is ready

**static void lv\_anim\_set\_playback**(*lv\_anim\_t* \*a, *uint16\_t* *wait\_time*)

Make the animation to play back to when the forward direction is ready

#### Parameters

- **a**: pointer to an initialized `lv_anim_t` variable
- **wait\_time**: time in milliseconds to wait before starting the back direction

**static void lv\_anim\_clear\_playback**(*lv\_anim\_t* \*a)

Disable playback. (Disabled after `lv_anim_init()`)

#### Parameters

- **a**: pointer to an initialized `lv_anim_t` variable

**static void lv\_anim\_set\_repeat**(*lv\_anim\_t* \*a, *uint16\_t* *wait\_time*)

Make the animation to start again when ready.

#### Parameters

- **a**: pointer to an initialized `lv_anim_t` variable
- **wait\_time**: time in milliseconds to wait before starting the animation again

**static void lv\_anim\_clear\_repeat**(*lv\_anim\_t* \*a)

Disable repeat. (Disabled after `lv_anim_init()`)

#### Parameters

- **a**: pointer to an initialized `lv_anim_t` variable

void **lv\_anim\_create**(*lv\_anim\_t* \*a)

Create an animation

**Parameters**

- **a**: an initialized ‘anim\_t’ variable. Not required after call.

bool **lv\_anim\_del**(void \*var, *lv\_anim\_exec\_xcb\_t* exec\_cb)

Delete an animation of a variable with a given animator function

**Return** true: at least 1 animation is deleted, false: no animation is deleted

**Parameters**

- **var**: pointer to variable
- **exec\_cb**: a function pointer which is animating ‘var’ , or NULL to ignore it and delete all the animations of ‘var’

static bool **lv\_anim\_custom\_del**(*lv\_anim\_t* \*a, *lv\_anim\_custom\_exec\_cb\_t* exec\_cb)

Delete an animation by getting the animated variable from **a**. Only animations with **exec\_cb** will be deleted. This function exist because it’s logical that all anim functions receives an **lv\_anim\_t** as their first parameter. It’s not practical in C but might makes the API more consequent and makes easier to generate bindings.

**Return** true: at least 1 animation is deleted, false: no animation is deleted

**Parameters**

- **a**: pointer to an animation.
- **exec\_cb**: a function pointer which is animating ‘var’ , or NULL to ignore it and delete all the animations of ‘var’

uint16\_t **lv\_anim\_count\_running**(void)

Get the number of currently running animations

**Return** the number of running animations

uint16\_t **lv\_anim\_speed\_to\_time**(uint16\_t speed, *lv\_anim\_value\_t* start, *lv\_anim\_value\_t* end)

Calculate the time of an animation with a given speed and the start and end values

**Return** the required time [ms] for the animation with the given parameters

**Parameters**

- **speed**: speed of animation in unit/sec
- **start**: start value of the animation
- **end**: end value of the animation

*lv\_anim\_value\_t* **lv\_anim\_path\_linear**(const *lv\_anim\_t* \*a)

Calculate the current value of an animation applying linear characteristic

**Return** the current value to set

**Parameters**

- **a**: pointer to an animation

*lv\_anim\_value\_t* **lv\_anim\_path\_ease\_in**(const *lv\_anim\_t* \*a)

Calculate the current value of an animation slowing down the start phase

**Return** the current value to set

**Parameters**

- **a**: pointer to an animation

*lv\_anim\_value\_t* **lv\_anim\_path\_ease\_out**(const *lv\_anim\_t* \*a)

Calculate the current value of an animation slowing down the end phase

**Return** the current value to set

#### Parameters

- **a**: pointer to an animation

*lv\_anim\_value\_t* **lv\_anim\_path\_ease\_in\_out**(const *lv\_anim\_t* \*a)

Calculate the current value of an animation applying an “S” characteristic (cosine)

**Return** the current value to set

#### Parameters

- **a**: pointer to an animation

*lv\_anim\_value\_t* **lv\_anim\_path\_overshoot**(const *lv\_anim\_t* \*a)

Calculate the current value of an animation with overshoot at the end

**Return** the current value to set

#### Parameters

- **a**: pointer to an animation

*lv\_anim\_value\_t* **lv\_anim\_path\_bounce**(const *lv\_anim\_t* \*a)

Calculate the current value of an animation with 3 bounces

**Return** the current value to set

#### Parameters

- **a**: pointer to an animation

*lv\_anim\_value\_t* **lv\_anim\_path\_step**(const *lv\_anim\_t* \*a)

Calculate the current value of an animation applying step characteristic. (Set end value on the end of the animation)

**Return** the current value to set

#### Parameters

- **a**: pointer to an animation

**struct \_lv\_anim\_t**

#include <lv\_anim.h> Describes an animation

#### Public Members

void \***var**

Variable to animate

*lv\_anim\_exec\_xcb\_t* **exec\_cb**

Function to execute to animate

*lv\_anim\_path\_cb\_t* **path\_cb**

Function to get the steps of animations

*lv\_anim\_ready\_cb\_t* **ready\_cb**

Call it when the animation is ready

`int32_t` **start**  
Start value

`int32_t` **end**  
End value

`uint16_t` **time**  
Animation time in ms

`int16_t` **act\_time**  
Current time in animation. Set to negative to make delay.

`uint16_t` **playback\_pause**  
Wait before play back

`uint16_t` **repeat\_pause**  
Wait before repeat

`lv_anim_user_data_t` **user\_data**  
Custom user data

`uint8_t` **playback**  
When the animation is ready play it back

`uint8_t` **repeat**  
Repeat the animation infinitely

`uint8_t` **playback\_now**  
Play back is in progress

`uint32_t` **has\_run**  
Indicates the animation has run in this round

## Tâches

LittlevGL has a built-in task system. You can register a function to have it be called periodically. The tasks are handled and called in `lv_task_handler()`, which needs to be called periodically every few milliseconds. Voir *Portage* pour plus d' informations.

The tasks are non-preemptive, which means a task cannot interrupt another task. Therefore, you can call any LittlevGL related function in a task.

## Créer une tâche

To create a new task, use `lv_task_create(task_cb, period_ms, LV_TASK_PRIO_OFF/LOWEST/LOW/MID/HIGH/HIGHEST, user_data)`. It will create an `lv_task_t *` variable, which can be used later to modify the parameters of the task. `lv_task_create_basic()` can also be used. It allows you to create a new task without specifying any parameters.

La fonction de rappel d' une tâche doit avoir la signature `void (* lv_task_cb_t)(lv_task_t *)`.

Par exemple :

```
void my_task(lv_task_t * task)
{
    /* Utilise les données de l'utilisateur */
    uint32_t * user_data = task->user_data;
    printf("my_task called with user data: %d\n", *user_data);
}
```

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```

/* Fait quelque chose avec LittlevGL */
if(something_happened) {
    something_happened = false;
    lv_btn_create(lv_scr_act(), NULL);
}
}

...

static uint32_t user_data = 10;
lv_task_t * task = lv_task_create(my_task, 500, LV_TASK_PRIO_MID, &user_data);

```

## Exécution et réinitialisation

`lv_task_ready(task)` fait exécuter la tâche lors du prochain appel de `lv_task_handler()`.

`lv_task_reset(task)` resets the period of a task. It will be called again after the defined period of milliseconds has elapsed.

## Paramètres

Vous pouvez modifier ultérieurement certains paramètres des tâches :

- `lv_task_set_cb(task, new_cb)`
- `lv_task_set_period(task, new_period)`
- `lv_task_set_prio(task, new_priority)`

## Tâches uniques

You can make a task to run only once by calling `lv_task_once(task)`. The task will automatically be deleted after being called for the first time.

## Mesurer le temps d' inactivité

You can get the idle percentage time `lv_task_handler` with `lv_task_get_idle()`. Note that, it doesn' t measure the idle time of the overall system, only `lv_task_handler`. It can be misleading if you use an operating system and call `lv_task_handler` in an task, as it won' t actually measure the time the OS spends in an idle thread.

## Appels asynchrones

In some cases, you can' t do an action immediately. For example, you can' t delete an object right now because something else is still using it or you don' t want to block the execution now. For these cases, you can use the `lv_async_call(my_function, data_p)` to make `my_function` be called on the next call of `lv_task_handler`. `data_p` will be passed to function when it' s called. Notez que seul le pointeur des données est enregistré. Vous devez donc vous assurer que la variable sera “à portée” lors de l' appel de la fonction. Pour cela, vous pouvez utiliser des données *statiques*, globales ou allouées dynamiquement.

Par exemple :

```
void my_screen_clean_up(void * scr)
{
    /* Libère des ressources liées à `scr` */

    /* Au final supprime l'écran */
    lv_obj_del(scr);
}

...

/* Fait quelque chose avec l'objet sur l'écran courant */

/* Supprime l'écran lors du prochain appel de `lv_task_handler`. Donc pas maintenant. ↵
↵ */
lv_async_call(my_screen_clean_up, lv_scr_act());

/* L'écran est toujours valide donc vous pouvez faire d'autres choses avec */
```

If you just want to delete an object, and don't need to clean anything up in `my_screen_cleanup`, you could just use `lv_obj_del_async`, which will delete the object on the next call to `lv_task_handler`.

## API

### Typedefs

**typedef** void (\***lv\_task\_cb\_t**)(**struct** *lv\_task\_t* \*)

Tasks execute this type type of functions.

**typedef** uint8\_t **lv\_task\_prio\_t**

**typedef** **struct** *lv\_task\_t* **lv\_task\_t**

Descriptor of a `lv_task`

### Enums

**enum** [anonymous]

Possible priorities for `lv_tasks`

*Values:*

**LV\_TASK\_PRIO\_OFF** = 0

**LV\_TASK\_PRIO\_LOWEST**

**LV\_TASK\_PRIO\_LOW**

**LV\_TASK\_PRIO\_MID**

**LV\_TASK\_PRIO\_HIGH**

**LV\_TASK\_PRIO\_HIGHEST**

**\_LV\_TASK\_PRIO\_NUM**



## Functions

void **lv\_task\_core\_init**(void)

Init the lv\_task module

lv\_task\_t \***lv\_task\_create\_basic**(void)

Create an “empty” task. It needs to be initialized with at least lv\_task\_set\_cb and lv\_task\_set\_period

**Return** pointer to the created task

lv\_task\_t \***lv\_task\_create**(lv\_task\_cb\_t task\_xcb, uint32\_t period, lv\_task\_prio\_t prio, void \*user\_data)

Create a new lv\_task

**Return** pointer to the new task

### Parameters

- **task\_xcb**: a callback which is the task itself. It will be called periodically. (the ‘x’ in the argument name indicates that it's not a fully generic function because it doesn't follow the func\_name(object, callback, ...) convention)
- **period**: call period in ms unit
- **prio**: priority of the task (LV\_TASK\_PRIO\_OFF means the task is stopped)
- **user\_data**: custom parameter

void **lv\_task\_del**(lv\_task\_t \*task)

Delete a lv\_task

### Parameters

- **task**: pointer to task\_cb created by task

void **lv\_task\_set\_cb**(lv\_task\_t \*task, lv\_task\_cb\_t task\_cb)

Set the callback the task (the function to call periodically)

### Parameters

- **task**: pointer to a task
- **task\_cb**: the function to call periodically

void **lv\_task\_set\_prio**(lv\_task\_t \*task, lv\_task\_prio\_t prio)

Set new priority for a lv\_task

### Parameters

- **task**: pointer to a lv\_task
- **prio**: the new priority

void **lv\_task\_set\_period**(lv\_task\_t \*task, uint32\_t period)

Set new period for a lv\_task

### Parameters

- **task**: pointer to a lv\_task
- **period**: the new period

void **lv\_task\_ready**(lv\_task\_t \*task)

Make a lv\_task ready. It will not wait its period.

### Parameters

- **task**: pointer to a `lv_task`.

void **lv\_task\_once**(*lv\_task\_t* \*task)  
Delete the `lv_task` after one call

#### Parameters

- **task**: pointer to a `lv_task`.

void **lv\_task\_reset**(*lv\_task\_t* \*task)  
Reset a `lv_task`. It will be called the previously set period milliseconds later.

#### Parameters

- **task**: pointer to a `lv_task`.

void **lv\_task\_enable**(bool en)  
Enable or disable the whole `lv_task` handling

#### Parameters

- **en**: true: `lv_task` handling is running, false: `lv_task` handling is suspended

uint8\_t **lv\_task\_get\_idle**(void)  
Get idle percentage

**Return** the `lv_task` idle in percentage

**struct \_lv\_task\_t**  
*#include <lv\_task.h>* Descriptor of a `lv_task`

#### Public Members

uint32\_t **period**  
How often the task should run

uint32\_t **last\_run**  
Last time the task ran

*lv\_task\_cb\_t* **task\_cb**  
Task function

void \***user\_data**  
Custom user data

uint8\_t **prio**  
Task priority

uint8\_t **once**  
1: one shot task

#### Dessin

With LittlevGL, you don't need to draw anything manually. Just create objects (like buttons and labels), move and change them and LittlevGL will refresh and redraw what is required.

Cependant, il peut être utile d'avoir une compréhension de base de la façon dont le dessin est effectué dans LittlevGL.

The basic concept is to not draw directly to the screen, but draw to an internal buffer first and then copy that buffer to screen when the rendering is ready. It has two main advantages:

1. **Avoids flickering** while layers of the UI are drawn. For example, when drawing a *background + button + text*, each “stage” would be visible for a short time.
2. **It’s faster** to modify a buffer in RAM and finally write one pixel once than read/write a display directly on each pixel access. (e.g. via a display controller with SPI interface). Hence, it’s suitable for pixels that are redrawn multiple times (e.g. background + button + text).

## Types de tampons

As you already might learn in the *Porting* section, there are 3 types of buffers:

1. **One buffer** - LittlevGL draws the content of the screen into a buffer and sends it to the display. The buffer can be smaller than the screen. In this case, the larger areas will be redrawn in multiple parts. If only small areas changes (e.g. button press), then only those areas will be refreshed.
2. **Two non-screen-sized buffers** - having two buffers, LittlevGL can draw into one buffer while the content of the other buffer is sent to display in the background. Le DMA ou une autre méthode doit être utilisé pour transférer les données à l’ écran afin de permettre au CPU de dessiner dans le même temps. This way, the rendering and refreshing of the display become parallel. If the buffer is smaller than the area to refresh, LittlevGL will draw the display’s content in chunks similar to the *One buffer*.
3. **Two screen-sized buffers** - In contrast to *Two non-screen-sized buffers*, LittlevGL will always provide the whole screen’s content, not only chunks. This way, the driver can simply change the address of the frame buffer to the buffer received from LittlevGL. Therefore, this method works best when the MCU has an LCD/TFT interface and the frame buffer is just a location in the RAM.

## Mécanisme de rafraîchissement de l’ écran

1. Something happens on the GUI which requires redrawing. For example, a button has been pressed, a chart has been changed or an animation happened, etc.
2. LittlevGL saves the changed object’s old and new area into a buffer, called an *Invalid area buffer*. For optimization, in some cases, objects are not added to the buffer:
  - Hidden objects are not added.
  - Objects completely out of their parent are not added.
  - Areas out of the parent are cropped to the parent’s area.
  - The object on other screens are not added.
3. A chaque `LV_DISP_DEF_REFR_PERIOD` (définie dans *lv\_conf.h*) :
  - LittlevGL checks the invalid areas and joins the adjacent or intersecting areas.
  - Takes the first joined area, if it’s smaller than the *display buffer*, then simply draw the areas’ content to the *display buffer*. If the area doesn’t fit into the buffer, draw as many lines as possible to the *display buffer*.
  - When the area is drawn, call `flush_cb` from the display driver to refresh the display.
  - If the area was larger than the buffer, redraw the remaining parts too.
  - Fait la même chose avec toutes les zones jointes.

While an area is redrawn, the library searches the most top object which covers the area to redraw, and starts to draw from that object. For example, if a button’s label has changed, the library will see that it’s enough to draw the button under the text, and it’s not required to draw the background too.

The difference between buffer types regarding the drawing mechanism is the following:

1. **One buffer** - LittlevGL needs to wait for `lv_disp_flush_ready()` (called at the end of `flush_cb`) before starting to redraw the next part.
2. **Two non-screen-sized buffers** - LittlevGL can immediately draw to the second buffer when the first is sent to `flush_cb` because the flushing should be done by DMA (or similar hardware) in the background.
3. **Two screen-sized buffers** - After calling `flush_cb`, the first buffer, if being displayed as frame buffer. Its content is copied to the second buffer and all the changes are drawn on top of it.

### 3.16.4 Types d' objet (éléments visuels)

#### Objet de base (lv\_obj)

##### Vue d' ensemble

The 'Base Object' implements the basic properties of an object on a screen, such as:

- coordonnées
- objet parent
- enfants
- style principal
- des attributs tels que *Clic autorisé*, *Glissé autorisé*, etc.

In object-oriented thinking, it is the base class which all other objects in LittlevGL inherit from. This, among another things, helps reduce code duplication.

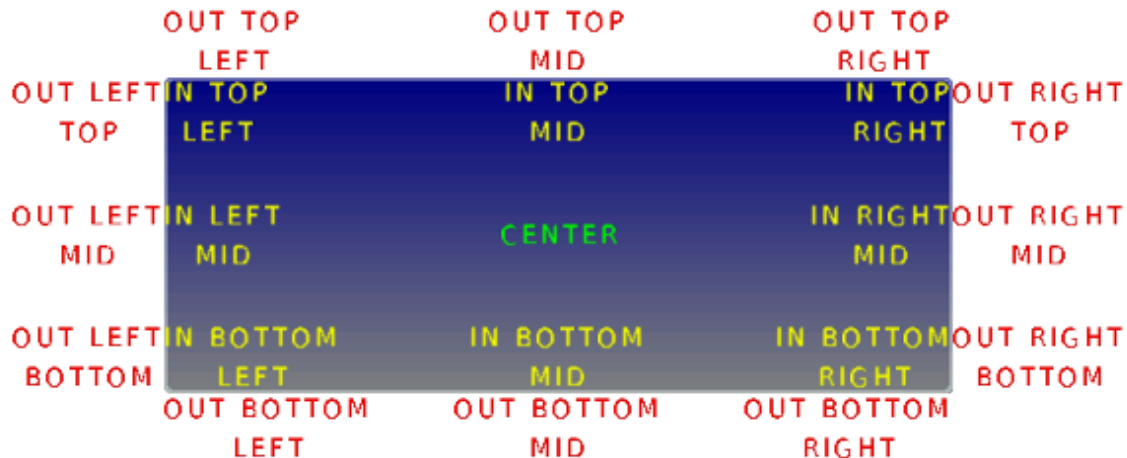
#### Coordonnées

The object size can be modified on individual axes with `lv_obj_set_width(obj, new_width)` and `lv_obj_set_height(obj, new_height)`, or both axes can be modified at the same time with `lv_obj_set_size(obj, new_width, new_height)`.

You can set the x and y coordinates relative to the parent with `lv_obj_set_x(obj, new_x)` and `lv_obj_set_y(obj, new_y)`, or both at the same time with `lv_obj_set_pos(obj, new_x, new_y)`.

You can align the object to another with `lv_obj_align(obj, obj_ref, LV_ALIGN_..., x_shift, y_shift)`.

- `obj` is the object to align.
- `obj_ref` is a reference object. `obj` will be aligned to it. If `obj_ref = NULL`, then the parent of `obj` will be used.
- The third argument is the *type* of alignment. These are the possible options:



The alignment types build like `LV_ALIGN_OUT_TOP_MID`.

- The last two arguments allow you to shift the object by a specified number of pixels after aligning it.

For example, to align a text below an image: `lv_obj_align(text, image, LV_ALIGN_OUT_BOTTOM_MID, 0, 10)`. Or to align a text in the middle of its parent: `lv_obj_align(text, NULL, LV_ALIGN_CENTER, 0, 0)`.

`lv_obj_align_origo` works similarly to `lv_obj_align` but, it aligns the center of the object rather than the top-left corner.

For example, `lv_obj_align_origo(btn, image, LV_ALIGN_OUT_BOTTOM_MID, 0, 0)` will align the center of the button the bottom of the image.

The parameters of the alignment will be saved in the object if `LV_USE_OBJ_REALIGN` is enabled in `lv_conf.h`. You can then realign the objects simply by calling `lv_obj_realign(obj)`. (It's equivalent to calling `lv_obj_align` again with the same parameters.)

If the alignment happened with `lv_obj_align_origo`, then it will be used when the object is realigned.

If `lv_obj_set_auto_realign(obj, true)` is used the object will be realigned automatically, if its size changes in `lv_obj_set_width/height/size()` functions. It's very useful when size animations are applied to the object and the original position needs to be kept.

**Note that the coordinates of screens can't be changed. Attempting to use these functions on screens will result in undefined behavior.**

## Parents et enfants

You can set a new parent for an object with `lv_obj_set_parent(obj, new_parent)`. To get the current parent, use `lv_obj_get_parent(obj)`.

To get the children of an object, use `lv_obj_get_child(obj, child_prev)` (from last to first) or `lv_obj_get_child_back(obj, child_prev)` (from first to last). To get the first child, pass `NULL` as the second parameter and use the return value to iterate through the children. The function will return `NULL` if there are no more children. For example:

```
lv_obj_t * child;
child = lv_obj_get_child(parent, NULL);
```

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```
while(child) {
    /* Fait quelque chose avec l'"enfant" */
    child = lv_obj_get_child(parent, child);
}
```

`lv_obj_count_children(obj)` indique le nombre d'enfants d'un objet.  
`lv_obj_count_children_recursive(obj)` indique également le nombre d'enfants mais compte récursivement les enfants d'enfants.

## Ecrans

When you have created a screen like `lv_obj_create(NULL, NULL)`, you can load it with `lv_scr_load(screen1)`. The `lv_scr_act()` function gives you a pointer to the current screen.

Si vous avez plusieurs d'affichages, il est important de savoir que ces fonctions opèrent sur l'affichage créé en dernier ou explicitement sélectionné (avec `lv_disp_set_default()`).

To get the screen an object is assigned to, use the `lv_obj_get_screen(obj)` function.

## Couches

Il y a deux couches générées automatiquement :

- la couche supérieure
- la couche système

They are independent of the screens and the same layers will be shown on every screen. The *top layer* is above every object on the screen and the *system layer* is above the *top layer* too. You can add any pop-up windows to the *top layer* freely. But, the *system layer* is restricted to system-level things (e.g. mouse cursor will be placed here in `lv_indev_set_cursor()`).

Les fonctions `lv_layer_top()` et `lv_layer_sys()` retournent un pointeur sur la couche supérieure ou la couche système.

You can bring an object to the foreground or send it to the background with `lv_obj_move_foreground(obj)` and `lv_obj_move_background(obj)`.

Read the [Layer overview](#) section to learn more about layers.

## Style

The base object stores the *Main style* of the object. To set a new style, use `lv_obj_set_style(obj, &new_style)` function. If `NULL` is set as style, then the object will inherit its parent's style.

Note that, you should use `lv_obj_set_style` only for "Base objects". Every other object type has its own style set function which should be used for them. For example, a button should use `lv_btn_set_style()`.

If you modify a style, which is already used by objects, in order to refresh the affected objects you can use either `lv_obj_refresh_style(obj)` on each object using it or to notify all objects with a given style use `lv_obj_report_style_mod(&style)`. If the parameter of `lv_obj_report_style_mod` is `NULL`, all objects will be notified.

Lisez la section [Styles](#) pour en savoir plus sur les styles.

## Evènements

To set an event callback for an object, use `lv_obj_set_event_cb(obj, event_cb)`,

To manually send an event to an object, use `lv_event_send(obj, LV_EVENT_..., data)`

Lisez *Evènements* pour en savoir plus sur les événements.

## Attributs

Certains attributs peuvent être activés/désactivés avec `lv_obj_set...(obj, true/false)` :

- **hidden** - Hide the object. It will not be drawn and will be considered by input devices as if it doesn't exist., Its children will be hidden too.
- **click** - Allows you to click the object via input devices. If disabled, then click events are passed to the object behind this one. (E.g. *Labels* are not clickable by default)
- **top** - If enabled then when this object or any of its children is clicked then this object comes to the foreground.
- **drag** - Enable dragging (moving by an input device)
- **drag\_dir** - Enable dragging only in specific directions. Can be `LV_DRAG_DIR_HOR/VER/ALL`.
- **drag\_throw** - Enable “throwing” with dragging as if the object would have momentum
- **drag\_parent** - If enabled then the object's parent will be moved during dragging. It will look like as if the parent is dragged. Checked recursively, so can propagate to grandparents too.
- **parent\_event** - Propagate the events to the parents too. Checked recursively, so can propagate to grandparents too.
- **opa\_scale\_enable** - Enable opacity scaling. See the `[#opa-scale](Opa scale)` section.

## Echelle d' opacité

If `lv_obj_set_opa_scale_enable(obj, true)` is set for an object, then the object's and all of its children's opacity can be adjusted with `lv_obj_set_opa_scale(obj, LV_OPA_...)`. Les opacités enregistrées dans les styles seront modifiées par ce facteur.

C' est très utile pour estomper/révéler un objet avec des enfants en utilisant une *Animation*.

A little bit of technical background: during the rendering process, the opacity of the object is decided by searching recursively up the object's family tree to find the first object with opacity scaling (Opa scale) enabled.

If an object is found with an enabled *Opa scale*, then that *Opa scale* will be used by the rendered object too.

Therefore, if you want to disable the Opa scaling for an object when the parent has Opa scale, just enable Opa scaling for the object and set its value to `LV_OPA_COVER`. It will overwrite the parent's settings.

## Protection

There are some specific actions which happen automatically in the library. To prevent one or more that kind of actions, you can protect the object against them. The following protections exists:

- **LV\_PROTECT\_NONE** Aucune protection

- **LV\_PROTECT\_POS** Empêche le positionnement automatique (p.ex. mise en page dans les *Conteneurs*)
- **LV\_PROTECT\_FOLLOW** Empêche que l' objet soit suivi (effectue un "saut de ligne" ) dans un ordre automatique (p.ex. mise en page dans les *Conteneurs*)
- **LV\_PROTECT\_PARENT** Empêche le changement de parent automatique (p.ex. *Page* déplace les enfants créés sur l' arrière-plan vers la zone de défilement)
- **LV\_PROTECT\_PRESS\_LOST** Evite de perdre un appui lors d' un déplacement hors de l' objet. (P.ex. un *Bouton* peut être relâché en dehors s' il est pressé)
- **LV\_PROTECT\_CLICK\_FOCUS** Empêche la sélection automatique de l' objet s' il se trouve dans un *groupe* et que la sélection sur clic est activé.
- **LV\_PROTECT\_CHILD\_CHG** Désactive le signal de changement d' enfant. Utilisé en interne par la librairie

Les fonctions `lv_obj_set/clear_protect(obj, LV_PROTECT...)` active/désactive la protection. Vous pouvez également combiner les valeurs des types de protection avec 'OU' .

## Groupes

Once, an object is added to *group* with `lv_group_add_obj(group, obj)` the object' s current group can be get with `lv_obj_get_group(obj)`.

`lv_obj_is_focused(obj)` tells if the object is currently focused on its group or not. If the object is not added to a group, `false` will be returned.

Lisez le *Périphériques d' entrée* pour en savoir plus sur les *groupes*.

## Zone étendue de clic

By default, the objects can be clicked only on their coordinates, however, this area can be extended with `lv_obj_set_ext_click_area(obj, left, right, top, bottom)`. `left/right/top/bottom` describes how far the clickable area should extend past the default in each direction.

Cette fonctionnalité doit être activée dans `lv_conf.h` avec `LV_USE_EXT_CLICK_AREA`. Les valeurs possibles sont :

- **LV\_EXT\_CLICK\_AREA\_FULL** mémorise les 4 coordonnées en `lv_coord_t`
- **LV\_EXT\_CLICK\_AREA\_TINY** n' enregistre que les coordonnées horizontales et verticales (utilise la plus grande valeur de gauche/ droite et haut/bas) en `uint8_t`
- **LV\_EXT\_CLICK\_AREA\_OFF** Désactive cette fonctionnalité

## Styles

Use `lv_obj_set_style(obj, &style)` to set a style for a base object.

Toutes les propriétés `style.body` sont utilisées. Le style par défaut pour les écrans est `lv_style_scr` et `lv_style_plain_color` pour les objets normaux



## Événements

Les Événements génériques sont envoyés par ce type d' objet.

Apprenez-en plus sur les *Événements*.

## Touches

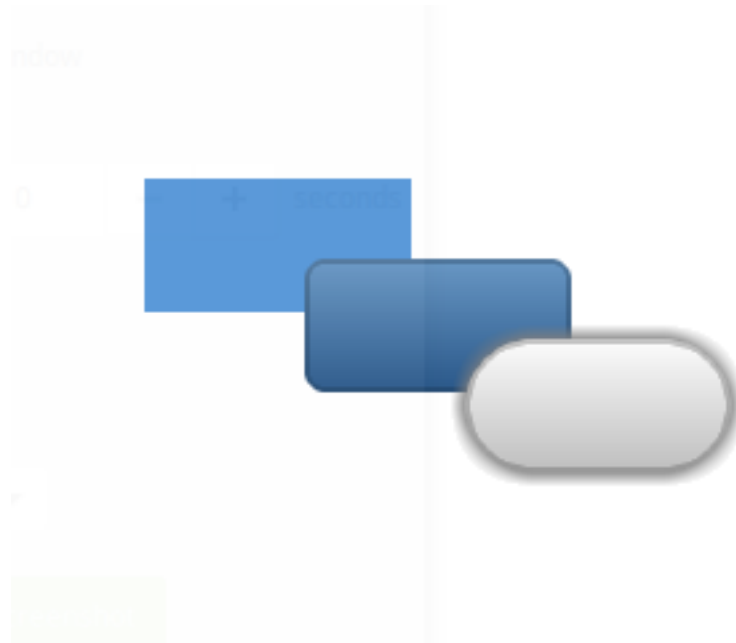
Aucune *touche* n' est traitée par ce type d' objet.

Apprenez-en plus sur les *touches*.

## Exemple

### C

#### Base objects with custom styles



code

```
#include "lvgl/lvgl.h"

void lv_ex_obj_1(void)
{
    lv_obj_t * obj1;
    obj1 = lv_obj_create(lv_scr_act(), NULL);
    lv_obj_set_size(obj1, 100, 50);
    lv_obj_set_style(obj1, &lv_style_plain_color);
    lv_obj_align(obj1, NULL, LV_ALIGN_CENTER, -60, -30);

    /*Copy the previous object and enable drag*/
}
```

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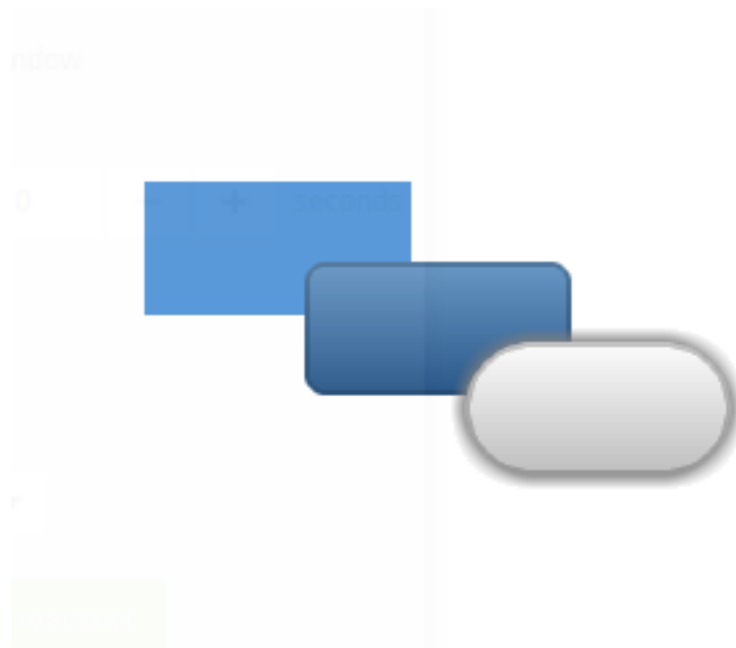
```
lv_obj_t * obj2;
obj2 = lv_obj_create(lv_scr_act(), obj1);
lv_obj_set_style(obj2, &lv_style_pretty_color);
lv_obj_align(obj2, NULL, LV_ALIGN_CENTER, 0, 0);
lv_obj_set_drag(obj2, true);

static lv_style_t style_shadow;
lv_style_copy(&style_shadow, &lv_style_pretty);
style_shadow.body.shadow.width = 6;
style_shadow.body.radius = LV_RADIUS_CIRCLE;

/*Copy the previous object (drag is already enabled)*/
lv_obj_t * obj3;
obj3 = lv_obj_create(lv_scr_act(), obj2);
lv_obj_set_style(obj3, &style_shadow);
lv_obj_align(obj3, NULL, LV_ALIGN_CENTER, 60, 30);
}
```

## MicroPython

### Base objects with custom styles



code

```
obj1 = lv.obj(lv.scr_act())
obj1.set_size(100, 50)
obj1.set_style(lv.style_plain_color)
obj1.align(None, lv.ALIGN.CENTER, -60, -30)

# Copy the previous object and enable drag
obj2 = lv.obj(lv.scr_act(), obj1)
```

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```
obj2.set_style(lv.style_pretty_color)
obj2.align(None, lv.ALIGN.CENTER, 0, 0)
obj2.set_drag(True)

style_shadow = lv.style_t()
lv.style_copy(style_shadow, lv.style_pretty)
style_shadow.body.shadow.width = 6
style_shadow.body.radius = 800 # large enough to make it round

# Copy the previous object (drag is already enabled)
obj3 = lv.obj(lv.scr_act(), obj2)
obj3.set_style(style_shadow)
obj3.align(None, lv.ALIGN.CENTER, 60, 30)
```

## API

### Typedefs

**typedef** uint8\_t **lv\_design\_mode\_t**

**typedef** bool (\***lv\_design\_cb\_t**)(**struct** *\_\_lv\_obj\_t* \*obj, **const** lv\_area\_t \*mask\_p, *lv\_design\_mode\_t* mode)

The design callback is used to draw the object on the screen. It accepts the object, a mask area, and the mode in which to draw the object.

**typedef** uint8\_t **lv\_event\_t**

Type of event being sent to the object.

**typedef** void (\***lv\_event\_cb\_t**)(**struct** *\_\_lv\_obj\_t* \*obj, *lv\_event\_t* event)

Event callback. Events are used to notify the user of some action being taken on the object. For details, see *lv\_event\_t*.

**typedef** uint8\_t **lv\_signal\_t**

**typedef** lv\_res\_t (\***lv\_signal\_cb\_t**)(**struct** *\_\_lv\_obj\_t* \*obj, *lv\_signal\_t* sign, void \*param)

**typedef** uint8\_t **lv\_align\_t**

**typedef** uint8\_t **lv\_drag\_dir\_t**

**typedef** **struct** *\_\_lv\_obj\_t* **lv\_obj\_t**

**typedef** uint8\_t **lv\_protect\_t**

### Enums

**enum** [anonymous]

Design modes

*Values:*

**LV\_DESIGN\_DRAW\_MAIN**

Draw the main portion of the object

**LV\_DESIGN\_DRAW\_POST**

Draw extras on the object

## **LV\_DESIGN\_COVER\_CHK**

Check if the object fully covers the ‘mask\_p’ area

**enum** [anonymous]

*Values:*

## **LV\_EVENT\_PRESSED**

The object has been pressed

## **LV\_EVENT\_PRESSING**

The object is being pressed (called continuously while pressing)

## **LV\_EVENT\_PRESS\_LOST**

User is still pressing but slid cursor/finger off of the object

## **LV\_EVENT\_SHORT\_CLICKED**

User pressed object for a short period of time, then released it. Not called if dragged.

## **LV\_EVENT\_LONG\_PRESSED**

Object has been pressed for at least LV\_INDEV\_LONG\_PRESS\_TIME. Not called if dragged.

## **LV\_EVENT\_LONG\_PRESSED\_REPEAT**

Called after LV\_INDEV\_LONG\_PRESS\_TIME in every LV\_INDEV\_LONG\_PRESS\_REPEAT\_TIME ms.  
Not called if dragged.

## **LV\_EVENT\_CLICKED**

Called on release if not dragged (regardless to long press)

## **LV\_EVENT\_RELEASED**

Called in every cases when the object has been released

## **LV\_EVENT\_DRAG\_BEGIN**

## **LV\_EVENT\_DRAG\_END**

## **LV\_EVENT\_DRAG\_THROW\_BEGIN**

## **LV\_EVENT\_KEY**

## **LV\_EVENT\_FOCUSED**

## **LV\_EVENT\_DEFOCUSED**

## **LV\_EVENT\_VALUE\_CHANGED**

The object’ s value has changed (i.e. slider moved)

## **LV\_EVENT\_INSERT**

## **LV\_EVENT\_REFRESH**

## **LV\_EVENT\_APPLY**

“Ok” , “Apply” or similar specific button has clicked

## **LV\_EVENT\_CANCEL**

“Close” , “Cancel” or similar specific button has clicked

## **LV\_EVENT\_DELETE**

Object is being deleted

**enum** [anonymous]

Signals are for use by the object itself or to extend the object’ s functionality. Applications should use [\*lv\\_obj\\_set\\_event\\_cb\*](#) to be notified of events that occur on the object.

*Values:*

**LV\_SIGNAL\_CLEANUP**

Object is being deleted

**LV\_SIGNAL\_CHILD\_CHG**

Child was removed/added

**LV\_SIGNAL\_CORD\_CHG**

Object coordinates/size have changed

**LV\_SIGNAL\_PARENT\_SIZE\_CHG**

Parent's size has changed

**LV\_SIGNAL\_STYLE\_CHG**

Object's style has changed

**LV\_SIGNAL\_BASE\_DIR\_CHG**

The base dir has changed

**LV\_SIGNAL\_REFR\_EXT\_DRAW\_PAD**

Object's extra padding has changed

**LV\_SIGNAL\_GET\_TYPE**

LittlevGL needs to retrieve the object's type

**LV\_SIGNAL\_PRESSED**

The object has been pressed

**LV\_SIGNAL\_PRESSING**

The object is being pressed (called continuously while pressing)

**LV\_SIGNAL\_PRESS\_LOST**

User is still pressing but slid cursor/finger off of the object

**LV\_SIGNAL\_RELEASED**

User pressed object for a short period of time, then released it. Not called if dragged.

**LV\_SIGNAL\_LONG\_PRESS**

Object has been pressed for at least LV\_INDEV\_LONG\_PRESS\_TIME. Not called if dragged.

**LV\_SIGNAL\_LONG\_PRESS\_REP**

Called after LV\_INDEV\_LONG\_PRESS\_TIME in every LV\_INDEV\_LONG\_PRESS\_REP\_TIME ms.  
Not called if dragged.

**LV\_SIGNAL\_DRAG\_BEGIN**

**LV\_SIGNAL\_DRAG\_END**

**LV\_SIGNAL\_FOCUS**

**LV\_SIGNAL\_DEFOCUS**

**LV\_SIGNAL\_CONTROL**

**LV\_SIGNAL\_GET\_EDITABLE**

**enum** [anonymous]  
Object alignment.

*Values:*

**LV\_ALIGN\_CENTER** = 0

**LV\_ALIGN\_IN\_TOP\_LEFT**

**LV\_ALIGN\_IN\_TOP\_MID**

**LV\_ALIGN\_IN\_TOP\_RIGHT**  
**LV\_ALIGN\_IN\_BOTTOM\_LEFT**  
**LV\_ALIGN\_IN\_BOTTOM\_MID**  
**LV\_ALIGN\_IN\_BOTTOM\_RIGHT**  
**LV\_ALIGN\_IN\_LEFT\_MID**  
**LV\_ALIGN\_IN\_RIGHT\_MID**  
**LV\_ALIGN\_OUT\_TOP\_LEFT**  
**LV\_ALIGN\_OUT\_TOP\_MID**  
**LV\_ALIGN\_OUT\_TOP\_RIGHT**  
**LV\_ALIGN\_OUT\_BOTTOM\_LEFT**  
**LV\_ALIGN\_OUT\_BOTTOM\_MID**  
**LV\_ALIGN\_OUT\_BOTTOM\_RIGHT**  
**LV\_ALIGN\_OUT\_LEFT\_TOP**  
**LV\_ALIGN\_OUT\_LEFT\_MID**  
**LV\_ALIGN\_OUT\_LEFT\_BOTTOM**  
**LV\_ALIGN\_OUT\_RIGHT\_TOP**  
**LV\_ALIGN\_OUT\_RIGHT\_MID**  
**LV\_ALIGN\_OUT\_RIGHT\_BOTTOM**

**enum** [anonymous]

*Values:*

**LV\_DRAG\_DIR\_HOR** = 0x1  
 Object can be dragged horizontally.  
**LV\_DRAG\_DIR\_VER** = 0x2  
 Object can be dragged vertically.  
**LV\_DRAG\_DIR\_ALL** = 0x3  
 Object can be dragged in all directions.

**enum** [anonymous]

*Values:*

**LV\_PROTECT\_NONE** = 0x00  
**LV\_PROTECT\_CHILD\_CHG** = 0x01  
 Disable the child change signal. Used by the library  
**LV\_PROTECT\_PARENT** = 0x02  
 Prevent automatic parent change (e.g. in lv\_page)  
**LV\_PROTECT\_POS** = 0x04  
 Prevent automatic positioning (e.g. in lv\_cont layout)  
**LV\_PROTECT\_FOLLOW** = 0x08  
 Prevent the object be followed in automatic ordering (e.g. in lv\_cont PRETTY layout)  
**LV\_PROTECT\_PRESS\_LOST** = 0x10  
 If the `indev` was pressing this object but swiped out while pressing do not search other object.

**LV\_PROTECT\_CLICK\_FOCUS** = 0x20

Prevent focusing the object by clicking on it

## Functions

void **lv\_init**(void)

Init. the ‘lv’ library.

void **lv\_deinit**(void)

Deinit the ‘lv’ library. Currently only implemented when not using custom allocators, or GC is enabled.

*lv\_obj\_t* \***lv\_obj\_create**(*lv\_obj\_t* \*parent, const *lv\_obj\_t* \*copy)

Create a basic object

**Return** pointer to the new object

### Parameters

- **parent**: pointer to a parent object. If NULL then a screen will be created
- **copy**: pointer to a base object, if not NULL then the new object will be copied from it

lv\_res\_t **lv\_obj\_del**(*lv\_obj\_t* \*obj)

Delete ‘obj’ and all of its children

**Return** LV\_RES\_INV because the object is deleted

### Parameters

- **obj**: pointer to an object to delete

void **lv\_obj\_del\_async**(struct \_*lv\_obj\_t* \*obj)

Helper function for asynchronously deleting objects. Useful for cases where you can’t delete an object directly in an LV\_EVENT\_DELETE handler (i.e. parent).

See lv\_async\_call

### Parameters

- **obj**: object to delete

void **lv\_obj\_clean**(*lv\_obj\_t* \*obj)

Delete all children of an object

### Parameters

- **obj**: pointer to an object

void **lv\_obj\_invalidate\_area**(const *lv\_obj\_t* \*obj, const lv\_area\_t \*area)

Mark an area of an object as invalid. This area will be redrawn by ‘lv\_refr\_task’

### Parameters

- **obj**: pointer to an object
- **area**: the area to redraw

void **lv\_obj\_invalidate**(const *lv\_obj\_t* \*obj)

Mark the object as invalid therefore its current position will be redrawn by ‘lv\_refr\_task’

### Parameters

- **obj**: pointer to an object

void **lv\_obj\_set\_parent**(*lv\_obj\_t* \*obj, *lv\_obj\_t* \*parent)

Set a new parent for an object. Its relative position will be the same.

**Parameters**

- **obj**: pointer to an object. Can' t be a screen.
- **parent**: pointer to the new parent object. (Can' t be NULL)

void **lv\_obj\_move\_foreground**(*lv\_obj\_t* \*obj)

Move and object to the foreground

**Parameters**

- **obj**: pointer to an object

void **lv\_obj\_move\_background**(*lv\_obj\_t* \*obj)

Move and object to the background

**Parameters**

- **obj**: pointer to an object

void **lv\_obj\_set\_pos**(*lv\_obj\_t* \*obj, lv\_coord\_t x, lv\_coord\_t y)

Set relative the position of an object (relative to the parent)

**Parameters**

- **obj**: pointer to an object
- **x**: new distance from the left side of the parent
- **y**: new distance from the top of the parent

void **lv\_obj\_set\_x**(*lv\_obj\_t* \*obj, lv\_coord\_t x)

Set the x coordinate of a object

**Parameters**

- **obj**: pointer to an object
- **x**: new distance from the left side from the parent

void **lv\_obj\_set\_y**(*lv\_obj\_t* \*obj, lv\_coord\_t y)

Set the y coordinate of a object

**Parameters**

- **obj**: pointer to an object
- **y**: new distance from the top of the parent

void **lv\_obj\_set\_size**(*lv\_obj\_t* \*obj, lv\_coord\_t w, lv\_coord\_t h)

Set the size of an object

**Parameters**

- **obj**: pointer to an object
- **w**: new width
- **h**: new height

void **lv\_obj\_set\_width**(*lv\_obj\_t* \*obj, lv\_coord\_t w)

Set the width of an object

**Parameters**

- **obj**: pointer to an object



- `w`: new width

void **lv\_obj\_set\_height**(*lv\_obj\_t* \*obj, lv\_coord\_t h)  
Set the height of an object

#### Parameters

- `obj`: pointer to an object
- `h`: new height

void **lv\_obj\_align**(*lv\_obj\_t* \*obj, const *lv\_obj\_t* \*base, *lv\_align\_t* align, lv\_coord\_t x\_mod, lv\_coord\_t y\_mod)  
Align an object to an other object.

#### Parameters

- `obj`: pointer to an object to align
- `base`: pointer to an object (if NULL the parent is used). ‘obj’ will be aligned to it.
- `align`: type of alignment (see ‘lv\_align\_t’ enum)
- `x_mod`: x coordinate shift after alignment
- `y_mod`: y coordinate shift after alignment

void **lv\_obj\_align\_origo**(*lv\_obj\_t* \*obj, const *lv\_obj\_t* \*base, *lv\_align\_t* align, lv\_coord\_t x\_mod, lv\_coord\_t y\_mod)  
Align an object to an other object.

#### Parameters

- `obj`: pointer to an object to align
- `base`: pointer to an object (if NULL the parent is used). ‘obj’ will be aligned to it.
- `align`: type of alignment (see ‘lv\_align\_t’ enum)
- `x_mod`: x coordinate shift after alignment
- `y_mod`: y coordinate shift after alignment

void **lv\_obj\_realign**(*lv\_obj\_t* \*obj)  
Realign the object based on the last `lv_obj_align` parameters.

#### Parameters

- `obj`: pointer to an object

void **lv\_obj\_set\_auto\_realign**(*lv\_obj\_t* \*obj, bool en)  
Enable the automatic realign of the object when its size has changed based on the last `lv_obj_align` parameters.

#### Parameters

- `obj`: pointer to an object
- `en`: true: enable auto realign; false: disable auto realign

void **lv\_obj\_set\_ext\_click\_area**(*lv\_obj\_t* \*obj, lv\_coord\_t left, lv\_coord\_t right, lv\_coord\_t top, lv\_coord\_t bottom)  
Set the size of an extended clickable area

#### Parameters

- `obj`: pointer to an object
- `left`: extended clickable are on the left [px]

- **right**: extended clickable are on the right [px]
- **top**: extended clickable are on the top [px]
- **bottom**: extended clickable are on the bottom [px]

void **lv\_obj\_set\_style**(*lv\_obj\_t* \*obj, const *lv\_style\_t* \*style)

Set a new style for an object

**Parameters**

- **obj**: pointer to an object
- **style\_p**: pointer to the new style

void **lv\_obj\_refresh\_style**(*lv\_obj\_t* \*obj)

Notify an object about its style is modified

**Parameters**

- **obj**: pointer to an object

void **lv\_obj\_report\_style\_mod**(*lv\_style\_t* \*style)

Notify all object if a style is modified

**Parameters**

- **style**: pointer to a style. Only the objects with this style will be notified (NULL to notify all objects)

void **lv\_obj\_set\_hidden**(*lv\_obj\_t* \*obj, bool en)

Hide an object. It won't be visible and clickable.

**Parameters**

- **obj**: pointer to an object
- **en**: true: hide the object

void **lv\_obj\_set\_click**(*lv\_obj\_t* \*obj, bool en)

Enable or disable the clicking of an object

**Parameters**

- **obj**: pointer to an object
- **en**: true: make the object clickable

void **lv\_obj\_set\_top**(*lv\_obj\_t* \*obj, bool en)

Enable to bring this object to the foreground if it or any of its children is clicked

**Parameters**

- **obj**: pointer to an object
- **en**: true: enable the auto top feature

void **lv\_obj\_set\_drag**(*lv\_obj\_t* \*obj, bool en)

Enable the dragging of an object

**Parameters**

- **obj**: pointer to an object
- **en**: true: make the object draggable

void **lv\_obj\_set\_drag\_dir**(*lv\_obj\_t* \*obj, *lv\_drag\_dir\_t* drag\_dir)

Set the directions an object can be dragged in

#### Parameters

- **obj**: pointer to an object
- **drag\_dir**: bitwise OR of allowed drag directions

void **lv\_obj\_set\_drag\_throw**(*lv\_obj\_t* \*obj, bool en)

Enable the throwing of an object after it is dragged

#### Parameters

- **obj**: pointer to an object
- **en**: true: enable the drag throw

void **lv\_obj\_set\_drag\_parent**(*lv\_obj\_t* \*obj, bool en)

Enable to use parent for drag related operations. If trying to drag the object the parent will be moved instead

#### Parameters

- **obj**: pointer to an object
- **en**: true: enable the ‘drag parent’ for the object

void **lv\_obj\_set\_parent\_event**(*lv\_obj\_t* \*obj, bool en)

Propagate the events to the parent too

#### Parameters

- **obj**: pointer to an object
- **en**: true: enable the event propagation

void **lv\_obj\_set\_base\_dir**(*lv\_obj\_t* \*obj, lv\_bidi\_dir\_t dir)

void **lv\_obj\_set\_opa\_scale\_enable**(*lv\_obj\_t* \*obj, bool en)

Set the opa scale enable parameter (required to set opa\_scale with [lv\\_obj\\_set\\_opa\\_scale\(\)](#))

#### Parameters

- **obj**: pointer to an object
- **en**: true: opa scaling is enabled for this object and all children; false: no opa scaling

void **lv\_obj\_set\_opa\_scale**(*lv\_obj\_t* \*obj, *lv\_opa\_t* opa\_scale)

Set the opa scale of an object. The opacity of this object and all its children will be scaled down with this factor. **lv\_obj\_set\_opa\_scale\_enable(obj, true)** needs to be called to enable it. (not for all children just for the parent where to start the opa scaling)

#### Parameters

- **obj**: pointer to an object
- **opa\_scale**: a factor to scale down opacity [0..255]

void **lv\_obj\_set\_protect**(*lv\_obj\_t* \*obj, uint8\_t prot)

Set a bit or bits in the protect field

#### Parameters

- **obj**: pointer to an object
- **prot**: ‘OR’ -ed values from **lv\_protect\_t**

void **lv\_obj\_clear\_protect**(*lv\_obj\_t* \*obj, uint8\_t prot)

Clear a bit or bits in the protect field

#### Parameters

- **obj**: pointer to an object
- **prot**: ‘OR’ -ed values from `lv_protect_t`

void **lv\_obj\_set\_event\_cb**(*lv\_obj\_t* \*obj, *lv\_event\_cb\_t* event\_cb)

Set a an event handler function for an object. Used by the user to react on event which happens with the object.

#### Parameters

- **obj**: pointer to an object
- **event\_cb**: the new event function

lv\_res\_t **lv\_event\_send**(*lv\_obj\_t* \*obj, *lv\_event\_t* event, **const** void \*data)

Send an event to the object

**Return** LV\_RES\_OK: **obj** was not deleted in the event; LV\_RES\_INV: **obj** was deleted in the event

#### Parameters

- **obj**: pointer to an object
- **event**: the type of the event from `lv_event_t`.
- **data**: arbitrary data depending on the object type and the event. (Usually **NULL**)

lv\_res\_t **lv\_event\_send\_func**(*lv\_event\_cb\_t* event\_xcb, *lv\_obj\_t* \*obj, *lv\_event\_t* event, **const** void \*data)

Call an event function with an object, event, and data.

**Return** LV\_RES\_OK: **obj** was not deleted in the event; LV\_RES\_INV: **obj** was deleted in the event

#### Parameters

- **event\_xcb**: an event callback function. If **NULL** LV\_RES\_OK will return without any actions. (the ‘x’ in the argument name indicates that its not a fully generic function because it not follows the `func_name(object, callback, ...)` convention)
- **obj**: pointer to an object to associate with the event (can be **NULL** to simply call the `event_cb`)
- **event**: an event
- **data**: pointer to a custom data

**const** void \***lv\_event\_get\_data**(void)

Get the **data** parameter of the current event

**Return** the **data** parameter

void **lv\_obj\_set\_signal\_cb**(*lv\_obj\_t* \*obj, *lv\_signal\_cb\_t* signal\_cb)

Set the a signal function of an object. Used internally by the library. Always call the previous signal function in the new.

#### Parameters

- **obj**: pointer to an object
- **signal\_cb**: the new signal function

void **lv\_signal\_send**(*lv\_obj\_t* \*obj, *lv\_signal\_t* signal, void \*param)

Send an event to the object

#### Parameters

- **obj**: pointer to an object
- **event**: the type of the event from `lv_event_t`.

void **lv\_obj\_set\_design\_cb**(*lv\_obj\_t* \*obj, *lv\_design\_cb\_t* design\_cb)

Set a new design function for an object

#### Parameters

- **obj**: pointer to an object
- **design\_cb**: the new design function

void \***lv\_obj\_allocate\_ext\_attr**(*lv\_obj\_t* \*obj, uint16\_t ext\_size)

Allocate a new ext. data for an object

**Return** pointer to the allocated ext

#### Parameters

- **obj**: pointer to an object
- **ext\_size**: the size of the new ext. data

void **lv\_obj\_refresh\_ext\_draw\_pad**(*lv\_obj\_t* \*obj)

Send a 'LV\_SIGNAL\_REFR\_EXT\_SIZE' signal to the object

#### Parameters

- **obj**: pointer to an object

*lv\_obj\_t* \***lv\_obj\_get\_screen**(const *lv\_obj\_t* \*obj)

Return with the screen of an object

**Return** pointer to a screen

#### Parameters

- **obj**: pointer to an object

*lv\_disp\_t* \***lv\_obj\_get\_disp**(const *lv\_obj\_t* \*obj)

Get the display of an object

**Return** pointer the object' s display

#### Parameters

- **scr**: pointer to an object

*lv\_obj\_t* \***lv\_obj\_get\_parent**(const *lv\_obj\_t* \*obj)

Returns with the parent of an object

**Return** pointer to the parent of 'obj'

#### Parameters

- **obj**: pointer to an object

*lv\_obj\_t* \***lv\_obj\_get\_child**(const *lv\_obj\_t* \*obj, const *lv\_obj\_t* \*child)

Iterate through the children of an object (start from the "youngest, lastly created" )

**Return** the child after 'act\_child' or NULL if no more child

#### Parameters

- **obj**: pointer to an object

- **child**: NULL at first call to get the next children and the previous return value later

`lv_obj_t *lv_obj_get_child_back(const lv_obj_t *obj, const lv_obj_t *child)`

Iterate through the children of an object (start from the “oldest”, firstly created)

**Return** the child after ‘act\_child’ or NULL if no more child

#### Parameters

- **obj**: pointer to an object
- **child**: NULL at first call to get the next children and the previous return value later

`uint16_t lv_obj_count_children(const lv_obj_t *obj)`

Count the children of an object (only children directly on ‘obj’)

**Return** children number of ‘obj’

#### Parameters

- **obj**: pointer to an object

`uint16_t lv_obj_count_children_recursive(const lv_obj_t *obj)`

Recursively count the children of an object

**Return** children number of ‘obj’

#### Parameters

- **obj**: pointer to an object

`void lv_obj_get_coords(const lv_obj_t *obj, lv_area_t *coords_p)`

Copy the coordinates of an object to an area

#### Parameters

- **obj**: pointer to an object
- **coords\_p**: pointer to an area to store the coordinates

`void lv_obj_get_inner_coords(const lv_obj_t *obj, lv_area_t *coords_p)`

Reduce area retried by `lv_obj_get_coords()` the get graphically usable area of an object. (Without the size of the border or other extra graphical elements)

#### Parameters

- **coords\_p**: store the result area here

`lv_coord_t lv_obj_get_x(const lv_obj_t *obj)`

Get the x coordinate of object

**Return** distance of ‘obj’ from the left side of its parent

#### Parameters

- **obj**: pointer to an object

`lv_coord_t lv_obj_get_y(const lv_obj_t *obj)`

Get the y coordinate of object

**Return** distance of ‘obj’ from the top of its parent

#### Parameters

- **obj**: pointer to an object

`lv_coord_t lv_obj_get_width(const lv_obj_t *obj)`

Get the width of an object

**Return** the width

**Parameters**

- **obj**: pointer to an object

`lv_coord_t lv_obj_get_height(const lv_obj_t *obj)`

Get the height of an object

**Return** the height

**Parameters**

- **obj**: pointer to an object

`lv_coord_t lv_obj_get_width_fit(const lv_obj_t *obj)`

Get that width reduced by the left and right padding.

**Return** the width which still fits into the container

**Parameters**

- **obj**: pointer to an object

`lv_coord_t lv_obj_get_height_fit(const lv_obj_t *obj)`

Get that height reduced by the top and bottom padding.

**Return** the height which still fits into the container

**Parameters**

- **obj**: pointer to an object

`bool lv_obj_get_auto_realign(const lv_obj_t *obj)`

Get the automatic realign property of the object.

**Return** true: auto realign is enabled; false: auto realign is disabled

**Parameters**

- **obj**: pointer to an object

`lv_coord_t lv_obj_get_ext_click_pad_left(const lv_obj_t *obj)`

Get the left padding of extended clickable area

**Return** the extended left padding

**Parameters**

- **obj**: pointer to an object

`lv_coord_t lv_obj_get_ext_click_pad_right(const lv_obj_t *obj)`

Get the right padding of extended clickable area

**Return** the extended right padding

**Parameters**

- **obj**: pointer to an object

`lv_coord_t lv_obj_get_ext_click_pad_top(const lv_obj_t *obj)`

Get the top padding of extended clickable area

**Return** the extended top padding

**Parameters**

- **obj**: pointer to an object

`lv_coord_t lv_obj_get_ext_click_pad_bottom(const lv_obj_t *obj)`

Get the bottom padding of extended clickable area

**Return** the extended bottom padding

**Parameters**

- `obj`: pointer to an object

`lv_coord_t lv_obj_get_ext_draw_pad(const lv_obj_t *obj)`

Get the extended size attribute of an object

**Return** the extended size attribute

**Parameters**

- `obj`: pointer to an object

`const lv_style_t *lv_obj_get_style(const lv_obj_t *obj)`

Get the style pointer of an object (if NULL get style of the parent)

**Return** pointer to a style

**Parameters**

- `obj`: pointer to an object

`bool lv_obj_get_hidden(const lv_obj_t *obj)`

Get the hidden attribute of an object

**Return** true: the object is hidden

**Parameters**

- `obj`: pointer to an object

`bool lv_obj_get_click(const lv_obj_t *obj)`

Get the click enable attribute of an object

**Return** true: the object is clickable

**Parameters**

- `obj`: pointer to an object

`bool lv_obj_get_top(const lv_obj_t *obj)`

Get the top enable attribute of an object

**Return** true: the auto top feature is enabled

**Parameters**

- `obj`: pointer to an object

`bool lv_obj_get_drag(const lv_obj_t *obj)`

Get the drag enable attribute of an object

**Return** true: the object is draggable

**Parameters**

- `obj`: pointer to an object

`lv_drag_dir_t lv_obj_get_drag_dir(const lv_obj_t *obj)`

Get the directions an object can be dragged

**Return** bitwise OR of allowed directions an object can be dragged in

**Parameters**



- `obj`: pointer to an object

bool **lv\_obj\_get\_drag\_throw**(const *lv\_obj\_t* \*obj)

Get the drag throw enable attribute of an object

**Return** true: drag throw is enabled

**Parameters**

- `obj`: pointer to an object

bool **lv\_obj\_get\_drag\_parent**(const *lv\_obj\_t* \*obj)

Get the drag parent attribute of an object

**Return** true: drag parent is enabled

**Parameters**

- `obj`: pointer to an object

bool **lv\_obj\_get\_parent\_event**(const *lv\_obj\_t* \*obj)

Get the drag parent attribute of an object

**Return** true: drag parent is enabled

**Parameters**

- `obj`: pointer to an object

*lv\_bidi\_dir\_t* **lv\_obj\_get\_base\_dir**(const *lv\_obj\_t* \*obj)

*lv\_opa\_t* **lv\_obj\_get\_opa\_scale\_enable**(const *lv\_obj\_t* \*obj)

Get the opa scale enable parameter

**Return** true: opa scaling is enabled for this object and all children; false: no opa scaling

**Parameters**

- `obj`: pointer to an object

*lv\_opa\_t* **lv\_obj\_get\_opa\_scale**(const *lv\_obj\_t* \*obj)

Get the opa scale parameter of an object

**Return** opa scale [0..255]

**Parameters**

- `obj`: pointer to an object

uint8\_t **lv\_obj\_get\_protect**(const *lv\_obj\_t* \*obj)

Get the protect field of an object

**Return** protect field ( ‘OR’ ed values of `lv_protect_t`)

**Parameters**

- `obj`: pointer to an object

bool **lv\_obj\_is\_protected**(const *lv\_obj\_t* \*obj, uint8\_t prot)

Check at least one bit of a given protect bitfield is set

**Return** false: none of the given bits are set, true: at least one bit is set

**Parameters**

- `obj`: pointer to an object
- `prot`: protect bits to test ( ‘OR’ ed values of `lv_protect_t`)

*lv\_signal\_cb\_t* **lv\_obj\_get\_signal\_cb**(const *lv\_obj\_t* \*obj)

Get the signal function of an object

**Return** the signal function

**Parameters**

- obj: pointer to an object

*lv\_design\_cb\_t* **lv\_obj\_get\_design\_cb**(const *lv\_obj\_t* \*obj)

Get the design function of an object

**Return** the design function

**Parameters**

- obj: pointer to an object

*lv\_event\_cb\_t* **lv\_obj\_get\_event\_cb**(const *lv\_obj\_t* \*obj)

Get the event function of an object

**Return** the event function

**Parameters**

- obj: pointer to an object

void **\*lv\_obj\_get\_ext\_attr**(const *lv\_obj\_t* \*obj)

Get the ext pointer

**Return** the ext pointer but not the dynamic version Use it as ext->data1, and NOT da(ext)->data1

**Parameters**

- obj: pointer to an object

void **lv\_obj\_get\_type**(const *lv\_obj\_t* \*obj, *lv\_obj\_type\_t* \*buf)

Get object' s and its ancestors type. Put their name in **type\_buf** starting with the current type. E.g. buf.type[0]= " lv\_btn" , buf.type[1]= " lv\_cont" , buf.type[2]= " lv\_obj"

**Parameters**

- obj: pointer to an object which type should be get
- buf: pointer to an *lv\_obj\_type\_t* buffer to store the types

*lv\_obj\_user\_data\_t* **lv\_obj\_get\_user\_data**(const *lv\_obj\_t* \*obj)

Get the object' s user data

**Return** user data

**Parameters**

- obj: pointer to an object

*lv\_obj\_user\_data\_t* **\*lv\_obj\_get\_user\_data\_ptr**(const *lv\_obj\_t* \*obj)

Get a pointer to the object' s user data

**Return** pointer to the user data

**Parameters**

- obj: pointer to an object

void **lv\_obj\_set\_user\_data**(*lv\_obj\_t* \*obj, *lv\_obj\_user\_data\_t* data)

Set the object' s user data. The data will be copied.

**Parameters**

- **obj**: pointer to an object
- **data**: user data

void **lv\_obj\_get\_group**(const *lv\_obj\_t* \*obj)

Get the group of the object

**Return** the pointer to group of the object

**Parameters**

- **obj**: pointer to an object

bool **lv\_obj\_is\_focused**(const *lv\_obj\_t* \*obj)

Tell whether the object is the focused object of a group or not.

**Return** true: the object is focused, false: the object is not focused or not in a group

**Parameters**

- **obj**: pointer to an object

lv\_res\_t **lv\_obj\_handle\_get\_type\_signal**(*lv\_obj\_type\_t* \*buf, const char \*name)

Used in the signal callback to handle LV\_SIGNAL\_GET\_TYPE signal

**Return** LV\_RES\_OK

**Parameters**

- **buf**: pointer to *lv\_obj\_type\_t*. (param in the signal callback)
- **name**: name of the object. E.g. "lv\_btn" . (Only the pointer is saved)

**struct lv\_realign\_t**

**Public Members**

const struct *\_lv\_obj\_t* \*base

lv\_coord\_t xofs

lv\_coord\_t yofs

*lv\_align\_t* align

uint8\_t auto\_realign

uint8\_t origo\_align

1: the origo (center of the object) was aligned with lv\_obj\_align\_origo

**struct \_lv\_obj\_t**

**Public Members**

struct *\_lv\_obj\_t* \*par

Pointer to the parent object

lv\_ll\_t child\_ll

Linked list to store the children objects

lv\_area\_t coords

Coordinates of the object (x1, y1, x2, y2)

*lv\_event\_cb\_t* event\_cb

Event callback function

*lv\_signal\_cb\_t* **signal\_cb**  
Object type specific signal function

*lv\_design\_cb\_t* **design\_cb**  
Object type specific design function

void **\*ext\_attr**  
Object type specific extended data

const lv\_style\_t **\*style\_p**  
Pointer to the object' s style

void **\*group\_p**  
Pointer to the group of the object

uint8\_t **ext\_click\_pad\_hor**  
Extra click padding in horizontal direction

uint8\_t **ext\_click\_pad\_ver**  
Extra click padding in vertical direction

lv\_area\_t **ext\_click\_pad**  
Extra click padding area.

uint8\_t **click**  
1: Can be pressed by an input device

uint8\_t **drag**  
1: Enable the dragging

uint8\_t **drag\_throw**  
1: Enable throwing with drag

uint8\_t **drag\_parent**  
1: Parent will be dragged instead

uint8\_t **hidden**  
1: Object is hidden

uint8\_t **top**  
1: If the object or its children is clicked it goes to the foreground

uint8\_t **opa\_scale\_en**  
1: opa\_scale is set

uint8\_t **parent\_event**  
1: Send the object' s events to the parent too.

*lv\_drag\_dir\_t* **drag\_dir**  
Which directions the object can be dragged in

lv\_bidi\_dir\_t **base\_dir**  
Base direction of texts related to this object

uint8\_t **reserved**  
Reserved for future use

uint8\_t **protect**  
Automatically happening actions can be prevented. 'OR' ed values from lv\_protect\_t

*lv\_opa\_t* **opa\_scale**  
Scale down the opacity by this factor. Effects all children as well

`lv_coord_t` **ext\_draw\_pad**  
EXTtend the size in every direction for drawing.

`lv_realign_t` **realign**  
Information about the last call to `lv_obj_align`.

`lv_obj_user_data_t` **user\_data**  
Custom user data for object.

## struct lv\_obj\_type\_t

`#include <lv_obj.h>` Used by `lv_obj_get_type()`. The object's and its ancestor types are stored here

### Public Members

**const** char \***type**[LV\_MAX\_ANCESTOR\_NUM]  
[0]: the actual type, [1]: ancestor, [2] #1's ancestor ...[x]: "lv\_obj"

## Arc (lv\_arc)

### Vue d' ensemble

L' objet *arc* trace un arc entre les angles de début et de fin dans une certaine épaisseur.

### Angles

To set the angles, use the `lv_arc_set_angles(arc, start_angle, end_angle)` function. The zero degree is at the bottom of the object and the degrees are increasing in a counter-clockwise direction. Les angles doivent être compris dans l' intervalle [0;360].

### Notes

Les **largeur et hauteur** de l' *arc* doivent être **identiques**.

Actuellement, l' objet *arc* **ne prend pas en charge** l' anticrénelage.

### Styles

To set the style of an *Arc* object, use `lv_arc_set_style(arc, LV_ARC_STYLE_MAIN, &style)`

- **line.rounded** - make the endpoints rounded (opacity won't work properly if set to 1)
- **line.width** - the thickness of the arc
- **line.color** - the color of the arc.

### Événements

Seuls les événements génériques sont envoyés par ce type d' objet.

Apprenez-en plus sur les *événements*.

## Touches

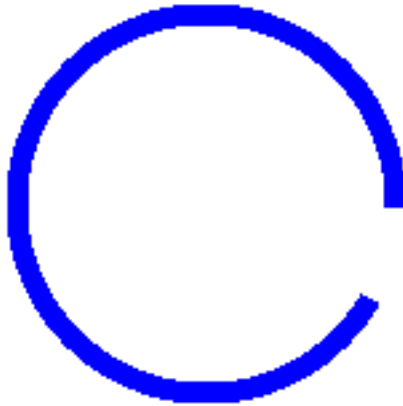
Aucune *touche* n' est traitée par ce type d' objet.

Apprenez-en plus sur les *touches*.

## Exemple

### C

#### Simple Arc



code

```
#include "lvgl/lvgl.h"

void lv_ex_arc_1(void)
{
    /*Create style for the Arcs*/
    static lv_style_t style;
    lv_style_copy(&style, &lv_style_plain);
    style.line.color = LV_COLOR_BLUE;           /*Arc color*/
    style.line.width = 8;                       /*Arc width*/

    /*Create an Arc*/
    lv_obj_t * arc = lv_arc_create(lv_scr_act(), NULL);
    lv_arc_set_style(arc, LV_ARC_STYLE_MAIN, &style);           /*Use the new style*/
    lv_arc_set_angles(arc, 90, 60);
    lv_obj_set_size(arc, 150, 150);
    lv_obj_align(arc, NULL, LV_ALIGN_CENTER, 0, 0);
}
```

## Loader with Arc



code

```
#include "lvgl/lvgl.h"

/**
 * An `lv_task` to call periodically to set the angles of the arc
 * @param t
 */
static void arc_loader(lv_task_t * t)
{
    static int16_t a = 0;

    a+=5;
    if(a >= 359) a = 359;

    if(a < 180) lv_arc_set_angles(t->user_data, 180-a ,180);
    else lv_arc_set_angles(t->user_data, 540-a ,180);

    if(a == 359) {
        lv_task_del(t);
        return;
    }
}

/**
 * Create an arc which acts as a loader.
 */
void lv_ex_arc_2(void)
{
    /*Create style for the Arcs*/
    static lv_style_t style;
    lv_style_copy(&style, &lv_style_plain);
    style.line.color = LV_COLOR_NAVY;          /*Arc color*/
}
```

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```

style.line.width = 8;                                /*Arc width*/

/*Create an Arc*/
lv_obj_t * arc = lv_arc_create(lv_scr_act(), NULL);
lv_arc_set_angles(arc, 180, 180);
lv_arc_set_style(arc, LV_ARC_STYLE_MAIN, &style);
lv_obj_align(arc, NULL, LV_ALIGN_CENTER, 0, 0);

/* Create an `lv_task` to update the arc.
 * Store the `arc` in the user data*/
lv_task_create(arc_loader, 20, LV_TASK_PRIO_LOWEST, arc);
}

```

## MicroPython

### Simple Arc



code

```

# Create style for the Arcs
style = lv.style_t()
lv.style_copy(style, lv.style_plain)
style.line.color = lv.color_make(0,0,255) # Arc color
style.line.width = 8                      # Arc width

# Create an Arc
arc = lv.arc(lv.scr_act())
arc.set_style(lv.arc.STYLE.MAIN, style)  # Use the new style
arc.set_angles(90, 60)
arc.set_size(150, 150)
arc.align(None, lv.ALIGN.CENTER, 0, 0)

```



## Loader with Arc



code

```
# Create an arc which acts as a loader.
class loader_arc(lv.arc):

    def __init__(self, parent, color=lv.color_hex(0x000080),
                  width=8, style=lv.style_plain, rate=20):
        super().__init__(parent)

        self.a = 0
        self.rate = rate

        # Create style for the Arcs
        self.style = lv.style_t()
        lv.style_copy(self.style, style)
        self.style.line.color = color
        self.style.line.width = width

        # Create an Arc
        self.set_angles(180, 180);
        self.set_style(self.STYLE.MAIN, self.style);

        # Spin the Arc
        self.spin()

    def spin(self):
        # Create an `lv_task` to update the arc.
        lv.task_create(self.task_cb, self.rate, lv.TASK_PRIO.LOWEST, {})

        # An `lv_task` to call periodically to set the angles of the arc
    def task_cb(self, task):
        self.a+=5;
```

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```

    if self.a >= 359: self.a = 359

    if self.a < 180: self.set_angles(180-self.a, 180)
    else: self.set_angles(540-self.a, 180)

    if self.a == 359:
        self.a = 0
        lv.task_del(task)

# Create a loader arc
loader_arc = loader_arc(lv.scr_act())
loader_arc.align(None, lv.ALIGN.CENTER, 0, 0)

```

## API

### Typedefs

**typedef** uint8\_t **lv\_arc\_style\_t**

### Enums

**enum** [anonymous]

*Values:*

**LV\_ARC\_STYLE\_MAIN**

### Functions

*lv\_obj\_t* \***lv\_arc\_create**(*lv\_obj\_t* \*par, **const** *lv\_obj\_t* \*copy)

Create a arc objects

**Return** pointer to the created arc

#### Parameters

- **par**: pointer to an object, it will be the parent of the new arc
- **copy**: pointer to a arc object, if not NULL then the new object will be copied from it

**void** **lv\_arc\_set\_angles**(*lv\_obj\_t* \*arc, uint16\_t start, uint16\_t end)

Set the start and end angles of an arc. 0 deg: bottom, 90 deg: right etc.

#### Parameters

- **arc**: pointer to an arc object
- **start**: the start angle [0..360]
- **end**: the end angle [0..360]

**void** **lv\_arc\_set\_style**(*lv\_obj\_t* \*arc, *lv\_arc\_style\_t* type, **const** *lv\_style\_t* \*style)

Set a style of a arc.

#### Parameters

- **arc**: pointer to arc object
- **type**: which style should be set

- **style**: pointer to a style

uint16\_t **lv\_arc\_get\_angle\_start**(lv\_obj\_t \*arc)

Get the start angle of an arc.

**Return** the start angle [0..360]

#### Parameters

- **arc**: pointer to an arc object

uint16\_t **lv\_arc\_get\_angle\_end**(lv\_obj\_t \*arc)

Get the end angle of an arc.

**Return** the end angle [0..360]

#### Parameters

- **arc**: pointer to an arc object

const lv\_style\_t \***lv\_arc\_get\_style**(const lv\_obj\_t \*arc, lv\_arc\_style\_t type)

Get style of a arc.

**Return** style pointer to the style

#### Parameters

- **arc**: pointer to arc object
- **type**: which style should be get

**struct lv\_arc\_ext\_t**

#### Public Members

lv\_coord\_t **angle\_start**

lv\_coord\_t **angle\_end**

## Barre (lv\_bar)

### Vue d' ensemble

The 'Bar' objects have got two main parts:

1. a **background** which is the object itself.
2. an **indicator** which shape is similar to the background but its width/height can be adjusted.

The orientation of the bar can be vertical or horizontal according to the width/height ratio. Logically, on horizontal bars, the indicator's width can be changed. Similarly, on vertical bars, the indicator's height can be changed.

### Valeur et intervalle

A new value can be set by **lv\_bar\_set\_value**(bar, new\_value, LV\_ANIM\_ON/OFF). The value is interpreted in a range (minimum and maximum values) which can be modified with **lv\_bar\_set\_range**(bar, min, max). L' intervalle par défaut est 1..100.

The new value in `lv_bar_set_value` can be set with or without an animation depending on the last parameter (`LV_ANIM_ON/OFF`). The time of the animation can be adjusted by `lv_bar_set_anim_time(bar, 100)`. The time is in milliseconds unit.

## Symétrique

The bar can be drawn symmetrical to zero (drawn from zero, left to right), if it's enabled with `lv_bar_set_sym(bar, true)`

## Styles

To set the style of an *Bar* object, use `lv_bar_set_style(arc, LV_BAR_STYLE_MAIN, &style)`:

- `LV_BAR_STYLE_BG` - is a *Base object*, therefore, it uses its style elements. Its default style is: `lv_style_pretty`.
- `LV_BAR_STYLE_INDIC` - is similar to the background. It uses the *left*, *right*, *top* and *bottom* paddings to keeps some space form the edges of the background. Its default style is: `lv_style_pretty_color`.

## Événements

Les *événements génériques* sont les seuls à être envoyés par ce type d' objet.

Apprenez-en plus sur les *événements*.

## Touches

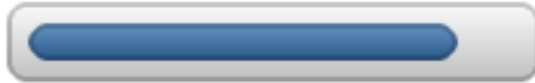
Aucune *touche* n' est traitée par ce type d' objet.

Apprenez-en plus sur les *touches*.

## Exemple

### C

## Simple Bar



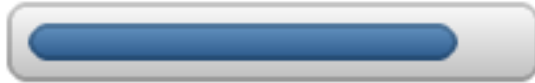
code

```
#include "lvgl/lvgl.h"

void lv_ex_bar_1(void)
{
    lv_obj_t * bar1 = lv_bar_create(lv_scr_act(), NULL);
    lv_obj_set_size(bar1, 200, 30);
    lv_obj_align(bar1, NULL, LV_ALIGN_CENTER, 0, 0);
    lv_bar_set_anim_time(bar1, 1000);
    lv_bar_set_value(bar1, 100, LV_ANIM_ON);
}
```

## MicroPython

## Simple Bar



code

```
bar1 = lv.bar(lv.scr_act())
bar1.set_size(200, 30)
bar1.align(None, lv.ALIGN.CENTER, 0, 0)
bar1.set_anim_time(1000)
bar1.set_value(100, lv.ANIM.ON)
```

## API

### Typedefs

**typedef** uint8\_t **lv\_bar\_style\_t**

### Enums

**enum** [anonymous]

Bar styles.

*Values:*

**LV\_BAR\_STYLE\_BG**

**LV\_BAR\_STYLE\_INDIC**

Bar background style.

### Functions

**LV\_EXPORT\_CONST\_INT**(LV\_BAR\_ANIM\_STATE\_START)

**LV\_EXPORT\_CONST\_INT**(LV\_BAR\_ANIM\_STATE\_END)

**LV\_EXPORT\_CONST\_INT**(LV\_BAR\_ANIM\_STATE\_INV)

**LV\_EXPORT\_CONST\_INT**(LV\_BAR\_ANIM\_STATE\_NORM)

*lv\_obj\_t* \***lv\_bar\_create**(*lv\_obj\_t* \**par*, **const** *lv\_obj\_t* \**copy*)

Create a bar objects

**Return** pointer to the created bar

**Parameters**

- **par**: pointer to an object, it will be the parent of the new bar
- **copy**: pointer to a bar object, if not NULL then the new object will be copied from it

void **lv\_bar\_set\_value**(*lv\_obj\_t* \**bar*, int16\_t *value*, *lv\_anim\_enable\_t* *anim*)

Set a new value on the bar

**Parameters**

- **bar**: pointer to a bar object
- **value**: new value
- **anim**: LV\_ANIM\_ON: set the value with an animation; LV\_ANIM\_OFF: change the value immediately

void **lv\_bar\_set\_range**(*lv\_obj\_t* \**bar*, int16\_t *min*, int16\_t *max*)

Set minimum and the maximum values of a bar

**Parameters**

- **bar**: pointer to the bar object
- **min**: minimum value
- **max**: maximum value

void **lv\_bar\_set\_sym**(*lv\_obj\_t* \**bar*, bool *en*)

Make the bar symmetric to zero. The indicator will grow from zero instead of the minimum position.

**Parameters**

- **bar**: pointer to a bar object
- **en**: true: enable disable symmetric behavior; false: disable

void **lv\_bar\_set\_anim\_time**(*lv\_obj\_t* \**bar*, uint16\_t *anim\_time*)

Set the animation time of the bar

**Parameters**

- **bar**: pointer to a bar object
- **anim\_time**: the animation time in milliseconds.

void **lv\_bar\_set\_style**(*lv\_obj\_t* \**bar*, *lv\_bar\_style\_t* *type*, **const** *lv\_style\_t* \**style*)

Set a style of a bar

**Parameters**

- **bar**: pointer to a bar object
- **type**: which style should be set
- **style**: pointer to a style

int16\_t **lv\_bar\_get\_value**(**const** *lv\_obj\_t* \**bar*)

Get the value of a bar

**Return** the value of the bar

**Parameters**

- **bar**: pointer to a bar object

`int16_t lv_bar_get_min_value(const lv_obj_t *bar)`

Get the minimum value of a bar

**Return** the minimum value of the bar

**Parameters**

- **bar**: pointer to a bar object

`int16_t lv_bar_get_max_value(const lv_obj_t *bar)`

Get the maximum value of a bar

**Return** the maximum value of the bar

**Parameters**

- **bar**: pointer to a bar object

`bool lv_bar_get_sym(lv_obj_t *bar)`

Get whether the bar is symmetric or not.

**Return** true: symmetric is enabled; false: disable

**Parameters**

- **bar**: pointer to a bar object

`uint16_t lv_bar_get_anim_time(lv_obj_t *bar)`

Get the animation time of the bar

**Return** the animation time in milliseconds.

**Parameters**

- **bar**: pointer to a bar object

`const lv_style_t *lv_bar_get_style(const lv_obj_t *bar, lv_bar_style_t type)`

Get a style of a bar

**Return** style pointer to a style

**Parameters**

- **bar**: pointer to a bar object
- **type**: which style should be get

`struct lv_bar_ext_t`

*#include <lv\_bar.h>* Data of bar

**Public Members**

`int16_t cur_value`

`int16_t min_value`

`int16_t max_value`

`lv_anim_value_t anim_start`

`lv_anim_value_t anim_end`



```

lv_anim_value_t anim_state
lv_anim_value_t anim_time
uint8_t sym
const lv_style_t *style_indic

```

## Bouton (lv\_btn)

### Vue d' ensemble

Buttons are simple rectangle-like objects, but they change their style and state when they are pressed or released.

### Etats

Les boutons peuvent prendre l' un des 5 états possibles :

- **LV\_BTN\_STATE\_REL** - Released state
- **LV\_BTN\_STATE\_PR** - Pressed state
- **LV\_BTN\_STATE\_TGL\_REL** - Toggled released state
- **LV\_BTN\_STATE\_TGL\_PR** - Toggled pressed state
- **LV\_BTN\_STATE\_INA** - Inactive state

The state from `..._REL` to `..._PR` will be changed automatically when the button is pressed or released.

L' état peut être défini par programmation avec `lv_btn_set_state(btn, LV_BTN_STATE_...)`.

### Bascule

You can configure the buttons as *toggle button* with `lv_btn_set_toggle(btn, true)`. In this case, on release, the button goes to *toggled released* state.

### Mise en page et adaptation

Similarly to *Containers*, buttons also have layout and fit attributes.

- `lv_btn_set_layout(btn, LV_LAYOUT_...)` set a layout. The default is `LV_LAYOUT_CENTER`. So, if you add a label, then it will be automatically aligned to the middle and can't be moved with `lv_obj_set_pos()`. You can disable the layout with `lv_btn_set_layout(btn, LV_LAYOUT_OFF)`.
- `lv_btn_set_fit/fit2/fit4(btn, LV_FIT_...)` permet d' adapter automatiquement la largeur et/ou la hauteur du bouton en fonction des enfants, du parent et du type d' adaptation.

## Effet d' encre

You can enable a special animation on buttons: when a button is pressed, the pressed state will be drawn in a growing circle starting from the point of pressing. It' s similar in appearance and functionality to the Material Design ripple effect.

Another way to think about it is like an ink droplet dropped into water. When the button is released, the released state will be reverted by fading. It' s like the ink is fully mixed with a lot of water and becomes invisible.

To control this animation, use the following functions:

- `lv_btn_set_ink_in_time(btn, time_ms)` - time of circle growing.
- `lv_btn_set_ink_wait_time(btn, time_ms)` - minim time to keep the fully covering (pressed) state.
- `lv_btn_set_ink_out_time(btn, time_ms)` - time fade back to releases state.

Cette fonctionnalité doit être activée avec `LV_BTN_INK_EFFECT 1` dans `lv_conf.h`.

## Styles

A button can have 5 independent styles for the 5 states. You can set them via: `lv_btn_set_style(btn, LV_BTN_STYLE_..., &style)`. The styles use the `style.body` properties.

- `LV_BTN_STYLE_REL` - style of the released state. Default: `lv_style_btn_rel`.
- `LV_BTN_STYLE_PR` - style of the pressed state. Default: `lv_style_btn_pr`.
- `LV_BTN_STYLE_TGL_REL` - style of the toggled released state. Default: `lv_style_btn_tgl_rel`.
- `LV_BTN_STYLE_TGL_PR` - style of the toggled pressed state. Default: `lv_style_btn_tgl_pr`.
- `LV_BTN_STYLE_INA` - style of the inactive state. Default: `lv_style_btn_ina`.

When you create a label on a button, it' s a good practice to set the button' s `style.text` properties too. Because labels have `style = NULL` by default, they inherit the parent' s (button) style. Hence you don' t need to create a new style for the label.

## Événements

Outre les [événements génériques](/overview/event.html #evenements-generiques), les événements spéciaux suivants sont envoyés par les boutons :

- `LV_EVENT_VALUE_CHANGED` - sent when the button is toggled.

Note that, the generic input device-related events (like `LV_EVENT_PRESSED`) are sent in the inactive state too. You need to check the state with `lv_btn_get_state(btn)` to ignore the events from inactive buttons.

Apprenez-en plus sur les *événements*.

## Touches

Les *touches* suivantes sont traitées par les boutons:

- **LV\_KEY\_RIGHT/UP** - Go to toggled state if toggling is enabled.
- **LV\_KEY\_LEFT/DOWN** - Go to non-toggled state if toggling is enabled.

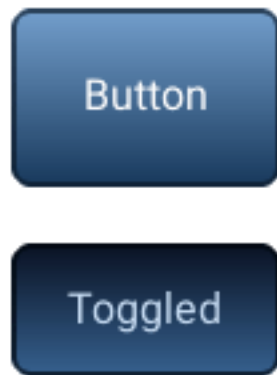
Note that, by default, the state of **LV\_KEY\_ENTER** is translated to **LV\_EVENT\_PRESSED/PRESSING/RELEASED** etc.

Apprenez-en plus sur les *touches*.

## Exemple

### C

#### Simple Buttons



code

```
#include "lvgl/lvgl.h"
#include <stdio.h>

static void event_handler(lv_obj_t * obj, lv_event_t event)
{
    if(event == LV_EVENT_CLICKED) {
        printf("Clicked\n");
    }
    else if(event == LV_EVENT_VALUE_CHANGED) {
        printf("Toggled\n");
    }
}

void lv_ex_btn_1(void)
{
    lv_obj_t * label;

    lv_obj_t * btn1 = lv_btn_create(lv_scr_act(), NULL);
```

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```
lv_obj_set_event_cb(btn1, event_handler);
lv_obj_align(btn1, NULL, LV_ALIGN_CENTER, 0, -40);

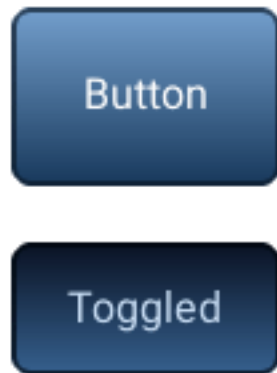
label = lv_label_create(btn1, NULL);
lv_label_set_text(label, "Button");

lv_obj_t * btn2 = lv_btn_create(lv_scr_act(), NULL);
lv_obj_set_event_cb(btn2, event_handler);
lv_obj_align(btn2, NULL, LV_ALIGN_CENTER, 0, 40);
lv_btn_set_toggle(btn2, true);
lv_btn_toggle(btn2);
lv_btn_set_fit2(btn2, LV_FIT_NONE, LV_FIT_TIGHT);

label = lv_label_create(btn2, NULL);
lv_label_set_text(label, "Toggled");
}
```

## MicroPython

### Simple Buttons



code

```
def event_handler(obj, event):
    if event == lv.EVENT.CLICKED:
        print("Clicked")

btn1 = lv.btn(lv.scr_act())
btn1.set_event_cb(event_handler)
btn1.align(None, lv.ALIGN.CENTER, 0, -40)

label = lv.label(btn1)
label.set_text("Button")
```

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```
btn2 = lv.btn(lv.scr_act())
# callback can be lambda:
btn2.set_event_cb(lambda obj, event: print("Toggled") if event == lv.EVENT.VALUE_
    ↳CHANGED else None)
btn2.align(None, lv.ALIGN.CENTER, 0, 40)
btn2.set_toggle(True)
btn2.toggle()
btn2.set_fit2(lv.FIT.NONE, lv.FIT.TIGHT)

label = lv.label(btn2)
label.set_text("Toggled")
```

## API

### Typedefs

**typedef** uint8\_t **lv\_btn\_state\_t**

**typedef** uint8\_t **lv\_btn\_style\_t**

### Enums

**enum** [anonymous]

Possible states of a button. It can be used not only by buttons but other button-like objects too

*Values:*

**LV\_BTN\_STATE\_REL**

Released

**LV\_BTN\_STATE\_PR**

Pressed

**LV\_BTN\_STATE\_TGL\_REL**

Toggled released

**LV\_BTN\_STATE\_TGL\_PR**

Toggled pressed

**LV\_BTN\_STATE\_INA**

Inactive

**\_LV\_BTN\_STATE\_NUM**

Number of states

**enum** [anonymous]

Styles

*Values:*

**LV\_BTN\_STYLE\_REL**

Release style

**LV\_BTN\_STYLE\_PR**

Pressed style

**LV\_BTN\_STYLE\_TGL\_REL**

Toggle released style

**LV\_BTN\_STYLE\_TGL\_PR**

Toggle pressed style

**LV\_BTN\_STYLE\_INA**

Inactive style

## Functions

*lv\_obj\_t* \***lv\_btn\_create**(*lv\_obj\_t* \*par, const *lv\_obj\_t* \*copy)

Create a button object

**Return** pointer to the created button

**Parameters**

- **par**: pointer to an object, it will be the parent of the new button
- **copy**: pointer to a button object, if not NULL then the new object will be copied from it

void **lv\_btn\_set\_toggle**(*lv\_obj\_t* \*btn, bool tgl)

Enable the toggled states. On release the button will change from/to toggled state.

**Parameters**

- **btn**: pointer to a button object
- **tgl**: true: enable toggled states, false: disable

void **lv\_btn\_set\_state**(*lv\_obj\_t* \*btn, *lv\_btn\_state\_t* state)

Set the state of the button

**Parameters**

- **btn**: pointer to a button object
- **state**: the new state of the button (from *lv\_btn\_state\_t* enum)

void **lv\_btn\_toggle**(*lv\_obj\_t* \*btn)

Toggle the state of the button (ON->OFF, OFF->ON)

**Parameters**

- **btn**: pointer to a button object

**static** void **lv\_btn\_set\_layout**(*lv\_obj\_t* \*btn, *lv\_layout\_t* layout)

Set the layout on a button

**Parameters**

- **btn**: pointer to a button object
- **layout**: a layout from 'lv\_cont\_layout\_t'

**static** void **lv\_btn\_set\_fit4**(*lv\_obj\_t* \*btn, *lv\_fit\_t* left, *lv\_fit\_t* right, *lv\_fit\_t* top, *lv\_fit\_t* bottom)

Set the fit policy in all 4 directions separately. It tells how to change the button size automatically.

**Parameters**

- **btn**: pointer to a button object
- **left**: left fit policy from *lv\_fit\_t*

- **right**: right fit policy from `lv_fit_t`
- **top**: top fit policy from `lv_fit_t`
- **bottom**: bottom fit policy from `lv_fit_t`

**static void lv\_btn\_set\_fit2**(*lv\_obj\_t* \*btn, *lv\_fit\_t* hor, *lv\_fit\_t* ver)

Set the fit policy horizontally and vertically separately. It tells how to change the button size automatically.

**Parameters**

- **btn**: pointer to a button object
- **hor**: horizontal fit policy from `lv_fit_t`
- **ver**: vertical fit policy from `lv_fit_t`

**static void lv\_btn\_set\_fit**(*lv\_obj\_t* \*btn, *lv\_fit\_t* fit)

Set the fit policy in all 4 direction at once. It tells how to change the button size automatically.

**Parameters**

- **btn**: pointer to a button object
- **fit**: fit policy from `lv_fit_t`

**void lv\_btn\_set\_ink\_in\_time**(*lv\_obj\_t* \*btn, *uint16\_t* time)

Set time of the ink effect (draw a circle on click to animate in the new state)

**Parameters**

- **btn**: pointer to a button object
- **time**: the time of the ink animation

**void lv\_btn\_set\_ink\_wait\_time**(*lv\_obj\_t* \*btn, *uint16\_t* time)

Set the wait time before the ink disappears

**Parameters**

- **btn**: pointer to a button object
- **time**: the time of the ink animation

**void lv\_btn\_set\_ink\_out\_time**(*lv\_obj\_t* \*btn, *uint16\_t* time)

Set time of the ink out effect (animate to the released state)

**Parameters**

- **btn**: pointer to a button object
- **time**: the time of the ink animation

**void lv\_btn\_set\_style**(*lv\_obj\_t* \*btn, *lv\_btn\_style\_t* type, **const** *lv\_style\_t* \*style)

Set a style of a button.

**Parameters**

- **btn**: pointer to button object
- **type**: which style should be set
- **style**: pointer to a style

*lv\_btn\_state\_t* **lv\_btn\_get\_state**(**const** *lv\_obj\_t* \*btn)

Get the current state of the button

**Return** the state of the button (from `lv_btn_state_t` enum)

#### Parameters

- **btn**: pointer to a button object

bool **lv\_btn\_get\_toggle**(const *lv\_obj\_t* \*btn)

Get the toggle enable attribute of the button

**Return** true: toggle enabled, false: disabled

#### Parameters

- **btn**: pointer to a button object

static *lv\_layout\_t* **lv\_btn\_get\_layout**(const *lv\_obj\_t* \*btn)

Get the layout of a button

**Return** the layout from 'lv\_cont\_layout\_t'

#### Parameters

- **btn**: pointer to button object

static *lv\_fit\_t* **lv\_btn\_get\_fit\_left**(const *lv\_obj\_t* \*btn)

Get the left fit mode

**Return** an element of *lv\_fit\_t*

#### Parameters

- **btn**: pointer to a button object

static *lv\_fit\_t* **lv\_btn\_get\_fit\_right**(const *lv\_obj\_t* \*btn)

Get the right fit mode

**Return** an element of *lv\_fit\_t*

#### Parameters

- **btn**: pointer to a button object

static *lv\_fit\_t* **lv\_btn\_get\_fit\_top**(const *lv\_obj\_t* \*btn)

Get the top fit mode

**Return** an element of *lv\_fit\_t*

#### Parameters

- **btn**: pointer to a button object

static *lv\_fit\_t* **lv\_btn\_get\_fit\_bottom**(const *lv\_obj\_t* \*btn)

Get the bottom fit mode

**Return** an element of *lv\_fit\_t*

#### Parameters

- **btn**: pointer to a button object

uint16\_t **lv\_btn\_get\_ink\_in\_time**(const *lv\_obj\_t* \*btn)

Get time of the ink in effect (draw a circle on click to animate in the new state)

**Return** the time of the ink animation

#### Parameters

- **btn**: pointer to a button object

uint16\_t **lv\_btn\_get\_ink\_wait\_time**(const *lv\_obj\_t* \*btn)

Get the wait time before the ink disappears



**Return** the time of the ink animation

**Parameters**

- **btn**: pointer to a button object

`uint16_t lv_btn_get_ink_out_time(const lv_obj_t *btn)`

Get time of the ink out effect (animate to the releases state)

**Return** the time of the ink animation

**Parameters**

- **btn**: pointer to a button object

`const lv_style_t *lv_btn_get_style(const lv_obj_t *btn, lv_btn_style_t type)`

Get style of a button.

**Return** style pointer to the style

**Parameters**

- **btn**: pointer to button object
- **type**: which style should be get

`struct lv_btn_ext_t`

*#include <lv\_btn.h>* Extended data of button

**Public Members**

`lv_cont_ext_t cont`

Ext. of ancestor

`const lv_style_t *styles[_LV_BTN_STATE_NUM]`

Styles in each state

`uint16_t ink_in_time`

[ms] Time of ink fill effect (0: disable ink effect)

`uint16_t ink_wait_time`

[ms] Wait before the ink disappears

`uint16_t ink_out_time`

[ms] Time of ink disappearing

`lv_btn_state_t state`

Current state of the button from 'lv\_btn\_state\_t' enum

`uint8_t toggle`

1: Toggle enabled

**Matrice de boutons (lv\_btm)**

**Vue d' ensemble**

The Button Matrix objects can display **multiple buttons** in rows and columns.

The main reasons for wanting to use a button matrix instead of a container and individual button objects are:

- The button matrix is simpler to use for grid-based button layouts.

- The button matrix consumes a lot less memory per button.

### Texte du bouton

There is a text on each button. To specify them a descriptor string array, called *map*, needs to be used. The map can be set with `lv_btnm_set_map(btnm, my_map)`. The declaration of a map should look like `const char * map[] = {"btn1", "btn2", "btn3", ""}`. Notez que le dernier élément doit être une chaîne vide !

Use `"\n"` in the map to make **line break**. E.g. `{"btn1", "btn2", "\n", "btn3", ""}`. Each line's buttons have their width calculated automatically.

### Contrôle des boutons

The **buttons width** can be set relative to the other button in the same line with `lv_btnm_set_btn_width(btnm, btn_id, width)` E.g. in a line with two buttons: *btnA*, *width = 1* and *btnB*, *width = 2*, *btnA* will have 33 % width and *btnB* will have 66 % width. It's similar to how the **flex-grow** property works in CSS.

In addition to width, each button can be customized with the following parameters:

- **LV\_BTNM\_CTRL\_HIDDEN** - make a button hidden (hidden buttons still take up space in the layout, they are just not visible or clickable)
- **LV\_BTNM\_CTRL\_NO\_REPEAT** - disable repeating when the button is long pressed
- **LV\_BTNM\_CTRL\_INACTIVE** - make a button inactive
- **LV\_BTNM\_CTRL\_TGL\_ENABLE** - enable toggling of a button
- **LV\_BTNM\_CTRL\_TGL\_STATE** - set the toggle state
- **LV\_BTNM\_CTRL\_CLICK\_TRIG** - if 0, the button will react on press, if 1, will react on release

The set or clear a button's control attribute, use `lv_btnm_set_btn_ctrl(btnm, btn_id, LV_BTNM_CTRL_...)` and `lv_btnm_clear_btn_ctrl(btnm, btn_id, LV_BTNM_CTRL_...)` respectively. More **LV\_BTNM\_CTRL\_...** values can be *Ored*

The set/clear the same control attribute for all buttons of a button matrix, use `lv_btnm_set_btn_ctrl_all(btnm, btn_id, LV_BTNM_CTRL_...)` and `lv_btnm_clear_btn_ctrl_all(btnm, btn_id, LV_BTNM_CTRL_...)`.

The set a control map for a button matrix (similarly to the map for the text), use `lv_btnm_set_ctrl_map(btnm, ctrl_map)`. Un élément de **ctrl\_map** devrait ressembler à `ctrl_map[0] = width | LV_BTNM_CTRL_NO_REPEAT | LV_BTNM_CTRL_TGL_ENABLE`. Le nombre d'éléments doit être égal au nombre de boutons (en excluant les caractères de saut de ligne).

### Une bascule

The “One toggle” feature can be enabled with `lv_btnm_set_one_toggle(btnm, true)` to allow only one button to be toggled at once.

### Recolorer

The **texts** on the button can be **recolor**ed similarly to the recolor feature for *Label* object. To enable it, use `lv_btnm_set_recolor(btnm, true)`. After that a button with `#FF0000 Red#` text will be red.

## Notes

L' objet Matrice de boutons est très léger, car les boutons ne sont pas créés mais simplement dessinés à la volée. This way, 1 button use only 8 extra bytes instead of the ~100-150 byte size of a normal *Button* object (plus the size of its container and a label for each button).

The disadvantage of this setup is that the ability to style individual buttons to be different from others is limited (aside from the toggling feature). If you require that ability, using individual buttons is very likely to be a better approach.

## Styles

The Button matrix works with 6 styles: a background and 5 button styles for each state. You can set the styles with `lv_btnm_set_style(btn, LV_BTNM_STYLE_..., &style)`. L' arrière-plan et les boutons utilisent les propriétés `style.body`. Les étiquettes utilisent les propriétés `style.text` des styles de bouton.

- **LV\_BTNM\_STYLE\_BG** - Background style. Uses all *style.body* properties including *padding*. Default: *lv\_style\_pretty*
- **LV\_BTNM\_STYLE\_BTN\_REL** - style of the released buttons. Default: *lv\_style\_btn\_rel*
- **LV\_BTNM\_STYLE\_BTN\_PR** - style of the pressed buttons. Default: *lv\_style\_btn\_pr*
- **LV\_BTNM\_STYLE\_BTN\_TGL\_REL** - style of the toggled released buttons. Default: *lv\_style\_btn\_tgl\_rel*
- **LV\_BTNM\_STYLE\_BTN\_TGL\_PR** - style of the toggled pressed buttons. Default: *lv\_style\_btn\_tgl\_pr*
- **LV\_BTNM\_STYLE\_BTN\_INA** - style of the inactive buttons. Default: *lv\_style\_btn\_ina*

## Événements

Besides the *Generic events*, the following *Special events* are sent by the button matrices:

- **LV\_EVENT\_VALUE\_CHANGED** - sent when the button is pressed/released or repeated after long press. The event data is set to the ID of the pressed/released button.

Apprenez-en plus sur les *événements*.

## Keys

Les *touches* suivantes sont traitées par les boutons :

- **LV\_KEY\_RIGHT/UP/LEFT/RIGHT** - To navigate among the buttons to select one
- **LV\_KEY\_ENTER** - To press/release the selected button

Apprenez-en plus sur les *touches*.

## Exemple

## C

## Simple Button matrix



code

```
#include "lvgl/lvgl.h"
#include <stdio.h>

static void event_handler(lv_obj_t * obj, lv_event_t event)
{
    if(event == LV_EVENT_VALUE_CHANGED) {
        const char * txt = lv_btm_get_active_btm_text(obj);

        printf("%s was pressed\n", txt);
    }
}

static const char * btm_map[] = {"1", "2", "3", "4", "5", "\n",
                                  "6", "7", "8", "9", "0", "\n",
                                  "Action1", "Action2", ""};

void lv_ex_btm_1(void)
{
    lv_obj_t * btm1 = lv_btm_create(lv_scr_act(), NULL);
    lv_btm_set_map(btm1, btm_map);
    lv_btm_set_btm_width(btm1, 10, 2);      /*Make "Action1" twice as wide as
↪ "Action2"*/
    lv_obj_align(btm1, NULL, LV_ALIGN_CENTER, 0, 0);
    lv_obj_set_event_cb(btm1, event_handler);
}
```

## MicroPython

## Simple Button matrix



code

```
def event_handler(obj, event):
    if event == lv.EVENT.VALUE_CHANGED:
        txt = obj.get_active_btn_text()
        print("%s was pressed" % txt)

btnm_map = ["1", "2", "3", "4", "5", "\n",
            "6", "7", "8", "9", "0", "\n",
            "Action1", "Action2", ""]

btnm1 = lv.btnm(lv.scr_act())
btnm1.set_map(btnm_map)
btnm1.set_btn_width(10, 2)      # Make "Action1" twice as wide as "Action2"
btnm1.align(None, lv.ALIGN.CENTER, 0, 0)
btnm1.set_event_cb(event_handler)
```

## API

### Typedefs

**typedef** uint16\_t **lv\_btnm\_ctrl\_t**

**typedef** uint8\_t **lv\_btnm\_style\_t**

### Enums

**enum** [anonymous]

Type to store button control bits (disabled, hidden etc.)

*Values:*

**LV\_BTNM\_CTRL\_HIDDEN** = 0x0008

Button hidden

**LV\_BTNM\_CTRL\_NO\_REPEAT** = 0x0010

Do not repeat press this button.

**LV\_BTNM\_CTRL\_INACTIVE** = 0x0020

Disable this button.

**LV\_BTNM\_CTRL\_TGL\_ENABLE** = 0x0040

Button *can* be toggled.

**LV\_BTNM\_CTRL\_TGL\_STATE** = 0x0080

Button is currently toggled (e.g. checked).

**LV\_BTNM\_CTRL\_CLICK\_TRIG** = 0x0100

1: Send LV\_EVENT\_SELECTED on CLICK, 0: Send LV\_EVENT\_SELECTED on PRESS

**enum** [anonymous]

*Values:*

**LV\_BTNM\_STYLE\_BG**

**LV\_BTNM\_STYLE\_BTN\_REL**

**LV\_BTNM\_STYLE\_BTN\_PR**

**LV\_BTNM\_STYLE\_BTN\_TGL\_REL**

**LV\_BTNM\_STYLE\_BTN\_TGL\_PR**

**LV\_BTNM\_STYLE\_BTN\_INA**

## Functions

**LV\_EXPORT\_CONST\_INT**(LV\_BTNM\_BTN\_NONE)

*lv\_obj\_t* \***lv\_btnm\_create**(*lv\_obj\_t* \*par, const *lv\_obj\_t* \*copy)

Create a button matrix objects

**Return** pointer to the created button matrix

**Parameters**

- **par**: pointer to an object, it will be the parent of the new button matrix
- **copy**: pointer to a button matrix object, if not NULL then the new object will be copied from it

void **lv\_btnm\_set\_map**(const *lv\_obj\_t* \*btnm, const char \*map[])

Set a new map. Buttons will be created/deleted according to the map. The button matrix keeps a reference to the map and so the string array must not be deallocated during the life of the matrix.

**Parameters**

- **btnm**: pointer to a button matrix object
- **map**: pointer a string array. The last string has to be: "" . Use "\n" to make a line break.

void **lv\_btnm\_set\_ctrl\_map**(const *lv\_obj\_t* \*btnm, const *lv\_btnm\_ctrl\_t* ctrl\_map[])

Set the button control map (hidden, disabled etc.) for a button matrix. The control map array will be copied and so may be deallocated after this function returns.

**Parameters**

- **btnm**: pointer to a button matrix object
- **ctrl\_map**: pointer to an array of `lv_btn_ctrl_t` control bytes. The length of the array and position of the elements must match the number and order of the individual buttons (i.e. excludes newline entries). An element of the map should look like e.g.: `ctrl_map[0] = width | LV_BTNM_CTRL_NO_REPEAT | LV_BTNM_CTRL_TGL_ENABLE`

void **lv\_btnm\_set\_pressed**(const *lv\_obj\_t* \**btnm*, uint16\_t *id*)

Set the pressed button i.e. visually highlight it. Mainly used a when the btnm is in a group to show the selected button

#### Parameters

- **btnm**: pointer to button matrix object
- **id**: index of the currently pressed button (`LV_BTNM_BTN_NONE` to unpress)

void **lv\_btnm\_set\_style**(*lv\_obj\_t* \**btnm*, *lv\_btnm\_style\_t* *type*, const *lv\_style\_t* \**style*)

Set a style of a button matrix

#### Parameters

- **btnm**: pointer to a button matrix object
- **type**: which style should be set
- **style**: pointer to a style

void **lv\_btnm\_set\_recolor**(const *lv\_obj\_t* \**btnm*, bool *en*)

Enable recoloring of button' s texts

#### Parameters

- **btnm**: pointer to button matrix object
- **en**: true: enable recoloring; false: disable

void **lv\_btnm\_set\_btn\_ctrl**(const *lv\_obj\_t* \**btnm*, uint16\_t *btn\_id*, *lv\_btnm\_ctrl\_t* *ctrl*)

Set the attributes of a button of the button matrix

#### Parameters

- **btnm**: pointer to button matrix object
- **btn\_id**: 0 based index of the button to modify. (Not counting new lines)

void **lv\_btnm\_clear\_btn\_ctrl**(const *lv\_obj\_t* \**btnm*, uint16\_t *btn\_id*, *lv\_btnm\_ctrl\_t* *ctrl*)

Clear the attributes of a button of the button matrix

#### Parameters

- **btnm**: pointer to button matrix object
- **btn\_id**: 0 based index of the button to modify. (Not counting new lines)

void **lv\_btnm\_set\_btn\_ctrl\_all**(*lv\_obj\_t* \**btnm*, *lv\_btnm\_ctrl\_t* *ctrl*)

Set the attributes of all buttons of a button matrix

#### Parameters

- **btnm**: pointer to a button matrix object
- **ctrl**: attribute(s) to set from `lv_btnm_ctrl_t`. Values can be ORed.

void **lv\_btnm\_clear\_btn\_ctrl\_all**(*lv\_obj\_t* \**btnm*, *lv\_btnm\_ctrl\_t* *ctrl*)

Clear the attributes of all buttons of a button matrix

#### Parameters

- **btnm**: pointer to a button matrix object
- **ctrl**: attribute(s) to set from `lv_btnm_ctrl_t`. Values can be ORed.
- **en**: true: set the attributes; false: clear the attributes

void **lv\_btnm\_set\_btn\_width**(const *lv\_obj\_t* \**btnm*, uint16\_t *btn\_id*, uint8\_t *width*)

Set a single buttons relative width. This method will cause the matrix be regenerated and is a relatively expensive operation. It is recommended that initial width be specified using `lv_btnm_set_ctrl_map` and this method only be used for dynamic changes.

#### Parameters

- **btnm**: pointer to button matrix object
- **btn\_id**: 0 based index of the button to modify.
- **width**: Relative width compared to the buttons in the same row. [1..7]

void **lv\_btnm\_set\_one\_toggle**(*lv\_obj\_t* \**btnm*, bool *one\_toggle*)

Make the button matrix like a selector widget (only one button may be toggled at a time).

Toggling must be enabled on the buttons you want to be selected with `lv_btnm_set_ctrl` or `lv_btnm_set_btn_ctrl_all`.

#### Parameters

- **btnm**: Button matrix object
- **one\_toggle**: Whether “one toggle” mode is enabled

const char \*\***lv\_btnm\_get\_map\_array**(const *lv\_obj\_t* \**btnm*)

Get the current map of a button matrix

**Return** the current map

#### Parameters

- **btnm**: pointer to a button matrix object

bool **lv\_btnm\_get\_recolor**(const *lv\_obj\_t* \**btnm*)

Check whether the button’ s text can use recolor or not

**Return** true: text recolor enable; false: disabled

#### Parameters

- **btnm**: pointer to button matrix object

uint16\_t **lv\_btnm\_get\_active\_btn**(const *lv\_obj\_t* \**btnm*)

Get the index of the lastly “activated” button by the user (pressed, released etc) Useful in the the `event_cb` to get the text of the button, check if hidden etc.

**Return** index of the last released button (LV\_BTNM\_BTN\_NONE: if unset)

#### Parameters

- **btnm**: pointer to button matrix object

const char \***lv\_btnm\_get\_active\_btn\_text**(const *lv\_obj\_t* \**btnm*)

Get the text of the lastly “activated” button by the user (pressed, released etc) Useful in the the `event_cb`

**Return** text of the last released button (NULL: if unset)

#### Parameters



- **btnm**: pointer to button matrix object

uint16\_t **lv\_btnm\_get\_pressed\_btn**(const lv\_obj\_t \*btnm)

Get the pressed button's index. The button be really pressed by the user or manually set to pressed with `lv_btnm_set_pressed`

**Return** index of the pressed button (LV\_BTNM\_BTN\_NONE: if unset)

#### Parameters

- **btnm**: pointer to button matrix object

const char \***lv\_btnm\_get\_btn\_text**(const lv\_obj\_t \*btnm, uint16\_t btn\_id)

Get the button's text

**Return** text of btn\_index' button

#### Parameters

- **btnm**: pointer to button matrix object
- **btn\_id**: the index a button not counting new line characters. (The return value of `lv_btnm_get_pressed/released`)

bool **lv\_btnm\_get\_btn\_ctrl**(lv\_obj\_t \*btnm, uint16\_t btn\_id, lv\_btnm\_ctrl\_t ctrl)

Get the whether a control value is enabled or disabled for button of a button matrix

**Return** true: long press repeat is disabled; false: long press repeat enabled

#### Parameters

- **btnm**: pointer to a button matrix object
- **btn\_id**: the index a button not counting new line characters. (E.g. the return value of `lv_btnm_get_pressed/released`)
- **ctrl**: control values to check (ORed value can be used)

const lv\_style\_t \***lv\_btnm\_get\_style**(const lv\_obj\_t \*btnm, lv\_btnm\_style\_t type)

Get a style of a button matrix

**Return** style pointer to a style

#### Parameters

- **btnm**: pointer to a button matrix object
- **type**: which style should be get

bool **lv\_btnm\_get\_one\_toggle**(const lv\_obj\_t \*btnm)

Find whether "one toggle" mode is enabled.

**Return** whether "one toggle" mode is enabled

#### Parameters

- **btnm**: Button matrix object

struct **lv\_btnm\_ext\_t**

#### Public Members

const char \*\***map\_p**

lv\_area\_t \***button\_areas**

lv\_btnm\_ctrl\_t \***ctrl\_bits**

```
const lv_style_t *styles_btn[_LV_BTN_STATE_NUM]
uint16_t btn_cnt
uint16_t btn_id_pr
uint16_t btn_id_act
uint8_t recolor
uint8_t one_toggle
```

## Calendrier (lv\_calendar)

### Vue d' ensemble

L' objet calendrier est un calendrier classique qui peut :

- mettre en évidence le jour et la semaine en cours,
- mettre en évidence les dates définies par l' utilisateur,
- afficher le nom des jours,
- aller au mois suivant/précédent en cliquant sur un bouton,
- mettre en évidence le jour cliqué.

To set and get dates in the calendar, the `lv_calendar_date_t` type is used which is a structure with `year`, `month` and `day` fields.

### Date courante

To set the current date (today), use the `lv_calendar_set_today_date(calendar, &today_date)` function.

### Date affichée

To set the shown date, use `lv_calendar_set_shown_date(calendar, &shown_date);`

### Jours mis en évidence

The list of highlighted dates should be stored in a `lv_calendar_date_t` array loaded by `lv_calendar_set_highlighted_dates(calendar, &highlighted_dates)`. Only the arrays pointer will be saved so the array should be a static or global variable.

### Nom des jours

Le nom des jours peut être spécifié avec `lv_calendar_set_day_names(calendar, day_names)` où `day_names` ressemble à `const char * day_names [7] = { "Di", "Lu", ... };`

## Nom des mois

Similarly to `day_names`, the name of the month can be set with `lv_calendar_set_month_names(calendar, month_names_array)`.

## Styles

You can set the styles with `lv_calendar_set_style(btn, LV_CALENDAR_STYLE_..., &style)`.

- **LV\_CALENDAR\_STYLE\_BG** - Style of the background using the **body** properties and the style of the date numbers using the **text** properties. **body.padding.left/right/bottom** padding will be added on the edges around the date numbers.
- **LV\_CALENDAR\_STYLE\_HEADER** - Style of the header where the current year and month is displayed. **body** and **text** properties are used.
- **LV\_CALENDAR\_STYLE\_HEADER\_PR** - Pressed header style, used when the next/prev. month button is being pressed. **text** properties are used by the arrows.
- **LV\_CALENDAR\_STYLE\_DAY\_NAMES** - Style of the day names. **text** properties are used by the ‘day’ texts and **body.padding.top** determines the space above the day names.
- **LV\_CALENDAR\_STYLE\_HIGHLIGHTED\_DAYS** - **text** properties are used to adjust the style of the highlights days.
- **LV\_CALENDAR\_STYLE\_INACTIVE\_DAYS** - **text** properties are used to adjust the style of the visible days of previous/next month.
- **LV\_CALENDAR\_STYLE\_WEEK\_BOX** - **body** properties are used to set the style of the week box.
- **LV\_CALENDAR\_STYLE\_TODAY\_BOX** - **body** and **text** properties are used to set the style of the today box.

## Événements

Besides the [Generic events](#), the following [Special events](#) are sent by the calendars: **LV\_EVENT\_VALUE\_CHANGED** est envoyé lorsque le mois en cours a changé.

In *Input device related* events, `lv_calendar_get_pressed_date(calendar)` tells which day is currently being pressed or return **NULL** if no date is pressed.

## Touches

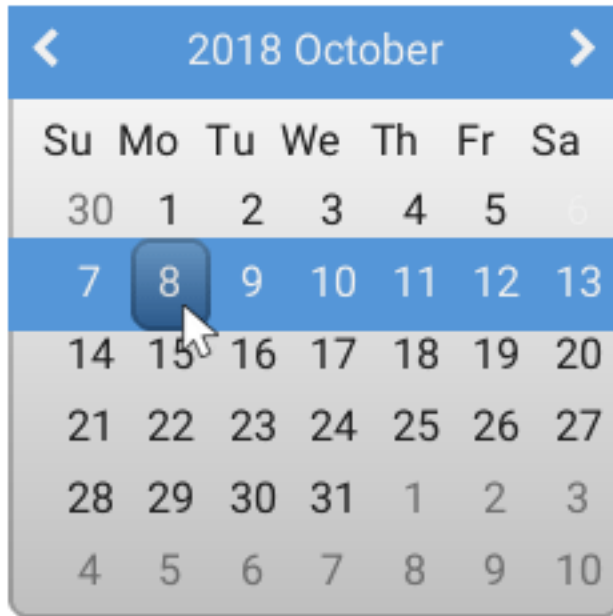
Aucune *touche* n’ est traitée par ce type d’ objet.

Apprenez-en plus sur les [touches](#).

## Exemple

### C

## Calendar with day select



code

```
#include "lvgl/lvgl.h"

static void event_handler(lv_obj_t * obj, lv_event_t event)
{
    if(event == LV_EVENT_CLICKED) {
        lv_calendar_date_t * date = lv_calendar_get_pressed_date(obj);
        if(date) {
            lv_calendar_set_today_date(obj, date);
        }
    }
}

void lv_ex_calendar_1(void)
{
    lv_obj_t * calendar = lv_calendar_create(lv_scr_act(), NULL);
    lv_obj_set_size(calendar, 230, 230);
    lv_obj_align(calendar, NULL, LV_ALIGN_CENTER, 0, 0);
    lv_obj_set_event_cb(calendar, event_handler);

    /*Set the today*/
    lv_calendar_date_t today;
    today.year = 2018;
    today.month = 10;
    today.day = 23;

    lv_calendar_set_today_date(calendar, &today);
    lv_calendar_set_showed_date(calendar, &today);

    /*Highlight some days*/
    static lv_calendar_date_t highlighted_days[3];          /*Only it's pointer will be saved so should be static*/
    /*Only it's pointer will be saved so should be static*/
}
```

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```

highlighted_days[0].year = 2018;
highlighted_days[0].month = 10;
highlighted_days[0].day = 6;

highlighted_days[1].year = 2018;
highlighted_days[1].month = 10;
highlighted_days[1].day = 11;

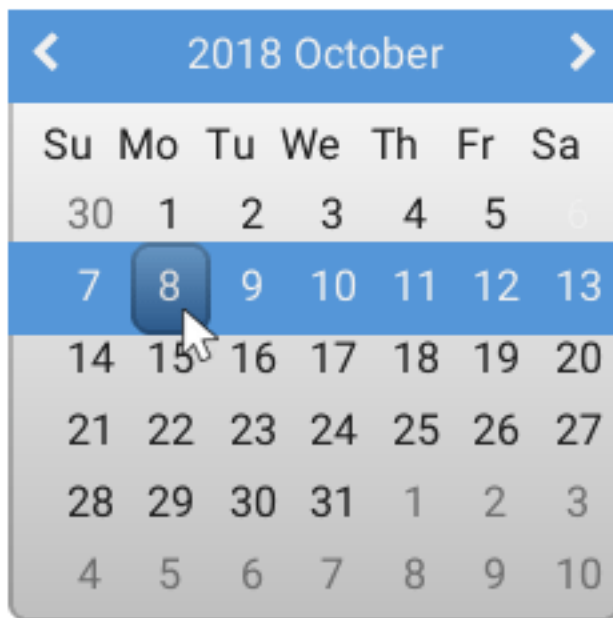
highlighted_days[2].year = 2018;
highlighted_days[2].month = 11;
highlighted_days[2].day = 22;

lv_calendar_set_highlighted_dates(calendar, highlighted_days, 3);
}

```

## MicroPython

### Calendar with day select



code

```

def event_handler(obj, event):
    if event == lv.EVENT.CLICKED:
        date = obj.get_pressed_date()
        if date is not None:
            obj.set_today_date(date)

calendar = lv.calendar(lv.scr_act())
calendar.set_size(230, 230)
calendar.align(None, lv.ALIGN.CENTER, 0, 0)
calendar.set_event_cb(event_handler)

```

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```
# Set the today
today = lv.calendar_date_t()
today.year = 2018
today.month = 10
today.day = 23

calendar.set_today_date(today)
calendar.set_showed_date(today)

highlighted_days = [
    lv.calendar_date_t({'year':2018, 'month':10, 'day':6}),
    lv.calendar_date_t({'year':2018, 'month':10, 'day':11}),
    lv.calendar_date_t({'year':2018, 'month':11, 'day':22})
]

calendar.set_highlighted_dates(highlighted_days, len(highlighted_days))
```

## API

### Typedefs

**typedef** uint8\_t **lv\_calendar\_style\_t**

### Enums

**enum** [anonymous]  
Calendar styles

*Values:*

- LV\_CALENDAR\_STYLE\_BG**  
Background and “normal” date numbers style
- LV\_CALENDAR\_STYLE\_HEADER**
- LV\_CALENDAR\_STYLE\_HEADER\_PR**  
Calendar header style
- LV\_CALENDAR\_STYLE\_DAY\_NAMES**  
Calendar header style (when pressed)
- LV\_CALENDAR\_STYLE\_HIGHLIGHTED\_DAYS**  
Day name style
- LV\_CALENDAR\_STYLE\_INACTIVE\_DAYS**  
Highlighted day style
- LV\_CALENDAR\_STYLE\_WEEK\_BOX**  
Inactive day style
- LV\_CALENDAR\_STYLE\_TODAY\_BOX**  
Week highlight style

## Functions

*lv\_obj\_t* \***lv\_calendar\_create**(*lv\_obj\_t* \*par, **const** *lv\_obj\_t* \*copy)

Create a calendar objects

**Return** pointer to the created calendar

### Parameters

- **par**: pointer to an object, it will be the parent of the new calendar
- **copy**: pointer to a calendar object, if not NULL then the new object will be copied from it

void **lv\_calendar\_set\_today\_date**(*lv\_obj\_t* \*calendar, *lv\_calendar\_date\_t* \*today)

Set the today's date

### Parameters

- **calendar**: pointer to a calendar object
- **today**: pointer to an *lv\_calendar\_date\_t* variable containing the date of today. The value will be saved it can be local variable too.

void **lv\_calendar\_set\_showed\_date**(*lv\_obj\_t* \*calendar, *lv\_calendar\_date\_t* \*showed)

Set the currently showed

### Parameters

- **calendar**: pointer to a calendar object
- **showed**: pointer to an *lv\_calendar\_date\_t* variable containing the date to show. The value will be saved it can be local variable too.

void **lv\_calendar\_set\_highlighted\_dates**(*lv\_obj\_t* \*calendar, *lv\_calendar\_date\_t* highlighted[], uint16\_t date\_num)

Set the the highlighted dates

### Parameters

- **calendar**: pointer to a calendar object
- **highlighted**: pointer to an *lv\_calendar\_date\_t* array containing the dates. ONLY A POINTER WILL BE SAVED! CAN' T BE LOCAL ARRAY.
- **date\_num**: number of dates in the array

void **lv\_calendar\_set\_day\_names**(*lv\_obj\_t* \*calendar, **const** char \*\*day\_names)

Set the name of the days

### Parameters

- **calendar**: pointer to a calendar object
- **day\_names**: pointer to an array with the names. E.g. **const** char \* days[7] = {"Sun", "Mon", ...} Only the pointer will be saved so this variable can' t be local which will be destroyed later.

void **lv\_calendar\_set\_month\_names**(*lv\_obj\_t* \*calendar, **const** char \*\*month\_names)

Set the name of the month

### Parameters

- **calendar**: pointer to a calendar object

- **month\_names**: pointer to an array with the names. E.g. `const char * days[12] = {"Jan", "Feb", ...}` Only the pointer will be saved so this variable can't be local which will be destroyed later.

void **lv\_calendar\_set\_style**(*lv\_obj\_t* \*calendar, *lv\_calendar\_style\_t* type, **const** *lv\_style\_t* \*style)

Set a style of a calendar.

#### Parameters

- **calendar**: pointer to calendar object
- **type**: which style should be set
- **style**: pointer to a style

*lv\_calendar\_date\_t* \***lv\_calendar\_get\_today\_date**(**const** *lv\_obj\_t* \*calendar)

Get the today's date

**Return** return pointer to an *lv\_calendar\_date\_t* variable containing the date of today.

#### Parameters

- **calendar**: pointer to a calendar object

*lv\_calendar\_date\_t* \***lv\_calendar\_get\_showed\_date**(**const** *lv\_obj\_t* \*calendar)

Get the currently showed

**Return** pointer to an *lv\_calendar\_date\_t* variable containing the date is being shown.

#### Parameters

- **calendar**: pointer to a calendar object

*lv\_calendar\_date\_t* \***lv\_calendar\_get\_pressed\_date**(**const** *lv\_obj\_t* \*calendar)

Get the the pressed date.

**Return** pointer to an *lv\_calendar\_date\_t* variable containing the pressed date. **NULL** if not date pressed (e.g. the header)

#### Parameters

- **calendar**: pointer to a calendar object

*lv\_calendar\_date\_t* \***lv\_calendar\_get\_highlighted\_dates**(**const** *lv\_obj\_t* \*calendar)

Get the the highlighted dates

**Return** pointer to an *lv\_calendar\_date\_t* array containing the dates.

#### Parameters

- **calendar**: pointer to a calendar object

uint16\_t **lv\_calendar\_get\_highlighted\_dates\_num**(**const** *lv\_obj\_t* \*calendar)

Get the number of the highlighted dates

**Return** number of highlighted days

#### Parameters

- **calendar**: pointer to a calendar object

**const** char \*\***lv\_calendar\_get\_day\_names**(**const** *lv\_obj\_t* \*calendar)

Get the name of the days

**Return** pointer to the array of day names

#### Parameters



- **calendar**: pointer to a calendar object

**const** char **\*\*lv\_calendar\_get\_month\_names**(**const** lv\_obj\_t \*calendar)

Get the name of the month

**Return** pointer to the array of month names

**Parameters**

- **calendar**: pointer to a calendar object

**const** lv\_style\_t **\*lv\_calendar\_get\_style**(**const** lv\_obj\_t \*calendar, lv\_calendar\_style\_t type)

Get style of a calendar.

**Return** style pointer to the style

**Parameters**

- **calendar**: pointer to calendar object
- **type**: which style should be get

**struct lv\_calendar\_date\_t**

*#include <lv\_calendar.h>* Represents a date on the calendar object (platform-agnostic).

**Public Members**

uint16\_t **year**

int8\_t **month**

int8\_t **day**

**struct lv\_calendar\_ext\_t**

**Public Members**

lv\_calendar\_date\_t **today**

lv\_calendar\_date\_t **showed\_date**

lv\_calendar\_date\_t \***highlighted\_dates**

int8\_t **btn\_pressing**

uint16\_t **highlighted\_dates\_num**

lv\_calendar\_date\_t **pressed\_date**

**const** char **\*\*day\_names**

**const** char **\*\*month\_names**

**const** lv\_style\_t **\*style\_header**

**const** lv\_style\_t **\*style\_header\_pr**

**const** lv\_style\_t **\*style\_day\_names**

**const** lv\_style\_t **\*style\_highlighted\_days**

**const** lv\_style\_t **\*style\_inactive\_days**

**const** lv\_style\_t **\*style\_week\_box**

```
const lv_style_t *style_today_box
```

## Canvas (lv\_canvas)

### Vue d' ensemble

A Canvas is like an *Image* where the user can draw anything.

### Tampon

The Canvas needs a buffer which stores the drawn image. To assign a buffer to a Canvas, use `lv_canvas_set_buffer(canvas, buffer, width, height, LV_IMG_CF_...)`. `buffer` is a static buffer (not just a local variable) to hold the image of the canvas. For example, `static lv_color_t buffer[LV_CANVAS_BUF_SIZE_TRUE_COLOR(width, height)]`. Les macros `LV_CANVAS_BUF_SIZE_...` aident à calculer la taille du tampon pour différents formats de couleur.

The canvas supports all the built-in color formats like `LV_IMG_CF_TRUE_COLOR` or `LV_IMG_CF_INDEXED_2BIT`. See the full list in the [Color formats](#) section.

### Palette

For `LV_IMG_CF_INDEXED_...` color formats, a palette needs to be initialized with `lv_canvas_set_palette(canvas, 3, LV_COLOR_RED)`. It sets pixels with `index=3` to red.

### Dessin

To set a pixel on the canvas, use `lv_canvas_set_px(canvas, x, y, LV_COLOR_RED)`. With `LV_IMG_CF_INDEXED_...` or `LV_IMG_CF_ALPHA_...`, the index of the color or the alpha value needs to be passed as color. E.g. `lv_color_t c; c.full = 3;`

`lv_canvas_fill_bg(canvas, LV_COLOR_BLUE)` remplit tout le canvas en bleu.

Un tableau de pixels peut être copié sur le canvas avec `lv_canvas_copy_buf(canvas, buffer_to_copy, x, y, width, height)`. Le format de couleur du tampon et du canevas doivent correspondre.

Pour dessiner sur le canvas, utilisez

- `lv_canvas_draw_rect(canvas, x, y, width, height, &style),`
- `lv_canvas_draw_text(canvas, x, y, max_width, &style, txt, LV_LABEL_ALIGN_LEFT/CENTER/RIGHT),`
- `lv_canvas_draw_img(canvas, x, y, &img_src, &style),`
- `lv_canvas_draw_line(canvas, point_array, point_cnt, &style),`
- `lv_canvas_draw_polygon(canvas, points_array, point_cnt, &style),`
- `lv_canvas_draw_arc(canvas, x, y, radius, start_angle, end_angle, &style).`

Ces fonctions ne peuvent dessiner que dans des tampons `LV_IMG_CF_TRUE_COLOR`, `LV_IMG_CF_TRUE_COLOR_CHROMA_KEYED` et `LV_IMG_CF_TRUE_COLOR_ALPHA`. `LV_IMG_CF_TRUE_COLOR_ALPHA` fonctionne uniquement avec `LV_COLOR_DEPTH 32`.

## Rotation

A rotated image can be added to canvas with `lv_canvas_rotate(canvas, &imd_dsc, angle, x, y, pivot_x, pivot_y)`. L' image spécifiée par `img_dsc` est transformé par rotation autour du pivot puis copiée dans le canvas aux coordonnées `x, y`. Instead of `img_dsc`, the buffer of another canvas also can be used by `lv_canvas_get_img(canvas)`.

Notez que la rotation d' un canvas ne peut se faire sur lui-même. Vous avez besoin d' une source, image ou canevas, et d' un canvas de destination.

## Styles

You can set the styles with `lv_canvas_set_style(btn, LV_CANVAS_STYLE_MAIN, &style)`. `style.image.color` is used to tell the base color with `LV_IMG_CF_ALPHA...` color format.

## Evénements

Seuls les [événements génériques](#) sont envoyés par ce type d' objet.

Apprenez-en plus sur les [événements](#).

## Touches

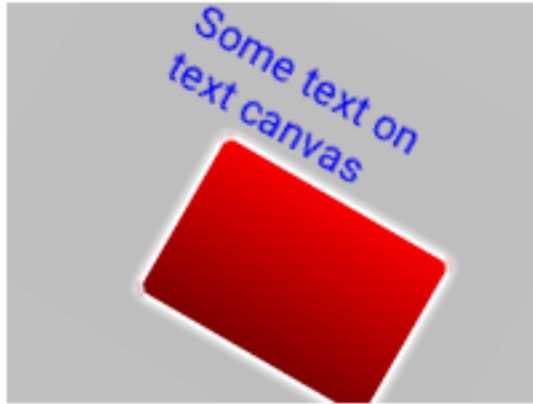
Aucune *touche* n' est traitée par ce type d' objet.

Apprenez-en plus sur les [touches](#).

## Exemple

### C

## Drawing on the Canvas and rotate



code

```
#include "lvgl/lvgl.h"

#define CANVAS_WIDTH 200
#define CANVAS_HEIGHT 150

void lv_ex_canvas_1(void)
{
    static lv_style_t style;
    lv_style_copy(&style, &lv_style_plain);
    style.body.main_color = LV_COLOR_RED;
    style.body.grad_color = LV_COLOR_MAROON;
    style.body.radius = 4;
    style.body.border.width = 2;
    style.body.border.color = LV_COLOR_WHITE;
    style.body.shadow.color = LV_COLOR_WHITE;
    style.body.shadow.width = 4;
    style.line.width = 2;
    style.line.color = LV_COLOR_BLACK;
    style.text.color = LV_COLOR_BLUE;

    static lv_color_t cbuf[LV_CANVAS_BUF_SIZE_TRUE_COLOR(CANVAS_WIDTH, CANVAS_
↪HEIGHT)];

    lv_obj_t * canvas = lv_canvas_create(lv_scr_act(), NULL);
    lv_canvas_set_buffer(canvas, cbuf, CANVAS_WIDTH, CANVAS_HEIGHT, LV_IMG_CF_TRUE_
↪COLOR);
    lv_obj_align(canvas, NULL, LV_ALIGN_CENTER, 0, 0);
    lv_canvas_fill_bg(canvas, LV_COLOR_SILVER);

    lv_canvas_draw_rect(canvas, 70, 60, 100, 70, &style);
}
```

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```
lv_canvas_draw_text(canvas, 40, 20, 100, &style, "Some text on text canvas", LV_
↪ LABEL_ALIGN_LEFT);

/* Test the rotation. It requires an other buffer where the original image is
↪ stored.
 * So copy the current image to buffer and rotate it to the canvas */
lv_color_t cbuf_tmp[CANVAS_WIDTH * CANVAS_HEIGHT];
memcpy(cbuf_tmp, cbuf, sizeof(cbuf_tmp));
lv_img_dsc_t img;
img.data = (void *)cbuf_tmp;
img.header.cf = LV_IMG_CF_TRUE_COLOR;
img.header.w = CANVAS_WIDTH;
img.header.h = CANVAS_HEIGHT;

lv_canvas_fill_bg(canvas, LV_COLOR_SILVER);
lv_canvas_rotate(canvas, &img, 30, 0, 0, CANVAS_WIDTH / 2, CANVAS_HEIGHT / 2);
}
```

### Transparent Canvas with chroma keying



code

```
#include "lvgl/lvgl.h"

#define CANVAS_WIDTH 50
#define CANVAS_HEIGHT 50

/**
 * Create a transparent canvas with Chroma keying and indexed color format (palette).
 */
void lv_ex_canvas_2(void)
{
```

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```

/*Create a button to better see the transparency*/
lv_btn_create(lv_scr_act(), NULL);

/*Create a buffer for the canvas*/
static lv_color_t cbuf[LV_CANVAS_BUF_SIZE_INDEXED_1BIT(CANVAS_WIDTH, CANVAS_
↪HEIGHT)];

/*Create a canvas and initialize its the palette*/
lv_obj_t * canvas = lv_canvas_create(lv_scr_act(), NULL);
lv_canvas_set_buffer(canvas, cbuf, CANVAS_WIDTH, CANVAS_HEIGHT, LV_IMG_CF_INDEXED_
↪1BIT);
lv_canvas_set_palette(canvas, 0, LV_COLOR_TRANSP);
lv_canvas_set_palette(canvas, 1, LV_COLOR_RED);

/*Create colors with the indices of the palette*/
lv_color_t c0;
lv_color_t c1;

c0.full = 0;
c1.full = 1;

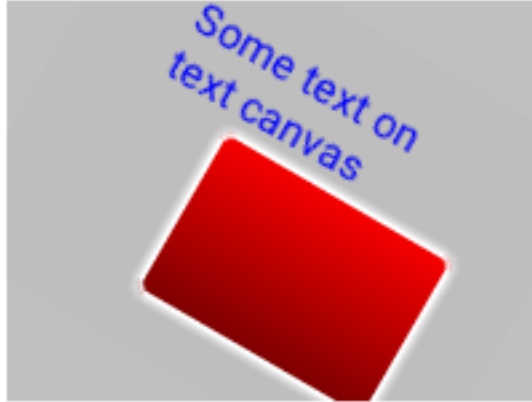
/*Transparent background*/
lv_canvas_fill_bg(canvas, c1);

/*Create hole on the canvas*/
uint32_t x;
uint32_t y;
for( y = 10; y < 30; y++) {
    for( x = 5; x < 20; x++) {
        lv_canvas_set_px(canvas, x, y, c0);
    }
}
}

```

## MicroPython

## Drawing on the Canvas and rotate



code

```
CANVAS_WIDTH  = 200
CANVAS_HEIGHT = 150

style = lv.style_t()
lv.style_copy(style, lv.style_plain)
style.body.main_color = lv.color_make(0xFF,0,0)
style.body.grad_color = lv.color_make(0x80,0,0)
style.body.radius = 4
style.body.border.width = 2
style.body.border.color = lv.color_make(0xFF,0xFF,0xFF)
style.body.shadow.color = lv.color_make(0xFF,0xFF,0xFF)
style.body.shadow.width = 4
style.line.width = 2
style.line.color = lv.color_make(0,0,0)
style.text.color = lv.color_make(0,0,0xFF)

# CF.TRUE_COLOR requires 4 bytes per pixel
cbuf = bytearray(CANVAS_WIDTH * CANVAS_HEIGHT * 4)

canvas = lv.canvas(lv.scr_act())
canvas.set_buffer(cbuf, CANVAS_WIDTH, CANVAS_HEIGHT, lv.img.CF.TRUE_COLOR)
canvas.align(None, lv.ALIGN.CENTER, 0, 0)
canvas.fill_bg(lv.color_make(0xC0, 0xC0, 0xC0))

canvas.draw_rect(70, 60, 100, 70, style)

canvas.draw_text(40, 20, 100, style, "Some text on text canvas", lv.label.ALIGN.LEFT)

# Test the rotation. It requires an other buffer where the original image is stored.
# So copy the current image to buffer and rotate it to the canvas
img = lv.img_dsc_t()
```

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```
img.data = cbuf[:]
img.header.cf = lv.img.CF.TRUE_COLOR
img.header.w = CANVAS_WIDTH
img.header.h = CANVAS_HEIGHT

canvas.fill_bg(lv.color_make(0xC0, 0xC0, 0xC0))
canvas.rotate(img, 30, 0, 0, CANVAS_WIDTH // 2, CANVAS_HEIGHT // 2)
```

### Transparent Canvas with chroma keying



code

```
# Create a transparent canvas with Chroma keying and indexed color format (palette).

CANVAS_WIDTH  = 50
CANVAS_HEIGHT = 50

def bufsize(w, h, bits, indexed=False):
    """this function determines required buffer size
    depending on the color depth"""
    size = (w * bits // 8 + 1) * h
    if indexed:
        # + 4 bytes per palette color
        size += 4 * (2**bits)
    return size

# Create a button to better see the transparency
lv.btn(lv.scr_act())

# Create a buffer for the canvas
cbuf = bytearray(bufsize(CANVAS_WIDTH, CANVAS_HEIGHT, 1, indexed=True))
```

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```
# Create a canvas and initialize its the palette
canvas = lv.canvas(lv.scr_act())
canvas.set_buffer(cbuf, CANVAS_WIDTH, CANVAS_HEIGHT, lv.img.CF.INDEXED_1BIT)
# transparent color can be defined in lv_conf.h and set to pure green by default
canvas.set_palette(0, lv.color_make(0x00, 0xFF, 0x00))
canvas.set_palette(1, lv.color_make(0xFF, 0x00, 0x00))

# Create colors with the indices of the palette
c0 = lv.color_t()
c1 = lv.color_t()

c0.full = 0
c1.full = 1

# Transparent background
canvas.fill_bg(c1)

# Create hole on the canvas
for y in range(10,30):
    for x in range(5, 20):
        canvas.set_px(x, y, c0)
```

## API

### Typedefs

**typedef** uint8\_t **lv\_canvas\_style\_t**

### Enums

**enum** [anonymous]

Values:

**LV\_CANVAS\_STYLE\_MAIN**

### Functions

*lv\_obj\_t* \***lv\_canvas\_create**(*lv\_obj\_t* \*par, const *lv\_obj\_t* \*copy)

Create a canvas object

**Return** pointer to the created canvas

**Parameters**

- **par**: pointer to an object, it will be the parent of the new canvas
- **copy**: pointer to a canvas object, if not NULL then the new object will be copied from it

void **lv\_canvas\_set\_buffer**(*lv\_obj\_t* \*canvas, void \*buf, lv\_coord\_t w, lv\_coord\_t h,  
*lv\_img\_cf\_t* cf)

Set a buffer for the canvas.

**Parameters**

- **buf**: a buffer where the content of the canvas will be. The required size is  $(lv\_img\_color\_format\_get\_px\_size(cf) * w * h) / 8$ . It can be allocated with `lv_mem_alloc()` or it can be statically allocated array (e.g. `static lv_color_t buf[100*50]`) or it can be an address in RAM or external SRAM
- **canvas**: pointer to a canvas object
- **w**: width of the canvas
- **h**: height of the canvas
- **cf**: color format. `LV_IMG_CF_...`

void **lv\_canvas\_set\_px**(*lv\_obj\_t* \*canvas, lv\_coord\_t x, lv\_coord\_t y, *lv\_color\_t* c)  
Set the color of a pixel on the canvas

#### Parameters

- **canvas**:
- **x**: x coordinate of the point to set
- **y**: y coordinate of the point to set
- **c**: color of the point

void **lv\_canvas\_set\_palette**(*lv\_obj\_t* \*canvas, uint8\_t id, *lv\_color\_t* c)  
Set the palette color of a canvas with index format. Valid only for `LV_IMG_CF_INDEXED1/2/4/8`

#### Parameters

- **canvas**: pointer to canvas object
- **id**: the palette color to set:
  - for `LV_IMG_CF_INDEXED1`: 0..1
  - for `LV_IMG_CF_INDEXED2`: 0..3
  - for `LV_IMG_CF_INDEXED4`: 0..15
  - for `LV_IMG_CF_INDEXED8`: 0..255
- **c**: the color to set

void **lv\_canvas\_set\_style**(*lv\_obj\_t* \*canvas, *lv\_canvas\_style\_t* type, **const** lv\_style\_t \*style)  
Set a style of a canvas.

#### Parameters

- **canvas**: pointer to canvas object
- **type**: which style should be set
- **style**: pointer to a style

*lv\_color\_t* **lv\_canvas\_get\_px**(*lv\_obj\_t* \*canvas, lv\_coord\_t x, lv\_coord\_t y)  
Get the color of a pixel on the canvas

**Return** color of the point

#### Parameters

- **canvas**:
- **x**: x coordinate of the point to set
- **y**: y coordinate of the point to set

*lv\_img\_dsc\_t* \***lv\_canvas\_get\_img**(*lv\_obj\_t* \**canvas*)

Get the image of the canvas as a pointer to an *lv\_img\_dsc\_t* variable.

**Return** pointer to the image descriptor.

**Parameters**

- **canvas**: pointer to a canvas object

**const** *lv\_style\_t* \***lv\_canvas\_get\_style**(**const** *lv\_obj\_t* \**canvas*, *lv\_canvas\_style\_t* *type*)

Get style of a canvas.

**Return** style pointer to the style

**Parameters**

- **canvas**: pointer to canvas object
- **type**: which style should be get

**void** **lv\_canvas\_copy\_buf**(*lv\_obj\_t* \**canvas*, **const** *void* \**to\_copy*, *lv\_coord\_t* *x*, *lv\_coord\_t* *y*,  
*lv\_coord\_t* *w*, *lv\_coord\_t* *h*)

Copy a buffer to the canvas

**Parameters**

- **canvas**: pointer to a canvas object
- **to\_copy**: buffer to copy. The color format has to match with the canvas' s buffer color format
- **x**: left side of the destination position
- **y**: top side of the destination position
- **w**: width of the buffer to copy
- **h**: height of the buffer to copy

**void** **lv\_canvas\_rotate**(*lv\_obj\_t* \**canvas*, *lv\_img\_dsc\_t* \**img*, *int16\_t* *angle*, *lv\_coord\_t* *offset\_x*, *lv\_coord\_t* *offset\_y*, *int32\_t* *pivot\_x*, *int32\_t* *pivot\_y*)

Rotate and image and store the result on a canvas.

**Parameters**

- **canvas**: pointer to a canvas object
- **img**: pointer to an image descriptor. Can be the image descriptor of an other canvas too (*lv\_canvas\_get\_img()*).
- **angle**: the angle of rotation (0..360);
- **offset\_x**: offset X to tell where to put the result data on destination canvas
- **offset\_y**: offset Y to tell where to put the result data on destination canvas
- **pivot\_x**: pivot X of rotation. Relative to the source canvas Set to **source width / 2** to rotate around the center
- **pivot\_y**: pivot Y of rotation. Relative to the source canvas Set to **source height / 2** to rotate around the center

**void** **lv\_canvas\_fill\_bg**(*lv\_obj\_t* \**canvas*, *lv\_color\_t* *color*)

Fill the canvas with color

**Parameters**

- **canvas**: pointer to a canvas

- **color**: the background color

```
void lv_canvas_draw_rect(lv_obj_t *canvas, lv_coord_t x, lv_coord_t y, lv_coord_t w,
                        lv_coord_t h, const lv_style_t *style)
```

Draw a rectangle on the canvas

#### Parameters

- **canvas**: pointer to a canvas object
- **x**: left coordinate of the rectangle
- **y**: top coordinate of the rectangle
- **w**: width of the rectangle
- **h**: height of the rectangle
- **style**: style of the rectangle (**body** properties are used except **padding**)

```
void lv_canvas_draw_text(lv_obj_t *canvas, lv_coord_t x, lv_coord_t y, lv_coord_t max_w,
                        const lv_style_t *style, const char *txt, lv_label_align_t align)
```

Draw a text on the canvas.

#### Parameters

- **canvas**: pointer to a canvas object
- **x**: left coordinate of the text
- **y**: top coordinate of the text
- **max\_w**: max width of the text. The text will be wrapped to fit into this size
- **style**: style of the text (**text** properties are used)
- **txt**: text to display
- **align**: align of the text (LV\_LABEL\_ALIGN\_LEFT/RIGHT/CENTER)

```
void lv_canvas_draw_img(lv_obj_t *canvas, lv_coord_t x, lv_coord_t y, const void *src,
                        const lv_style_t *style)
```

Draw an image on the canvas

#### Parameters

- **canvas**: pointer to a canvas object
- **src**: image source. Can be a pointer an *lv\_img\_dsc\_t* variable or a path an image.
- **style**: style of the image (**image** properties are used)

```
void lv_canvas_draw_line(lv_obj_t *canvas, const lv_point_t *points, uint32_t point_cnt,
                        const lv_style_t *style)
```

Draw a line on the canvas

#### Parameters

- **canvas**: pointer to a canvas object
- **points**: point of the line
- **point\_cnt**: number of points
- **style**: style of the line (**line** properties are used)

```
void lv_canvas_draw_polygon(lv_obj_t *canvas, const lv_point_t *points, uint32_t
                           point_cnt, const lv_style_t *style)
```

Draw a polygon on the canvas

### Parameters

- **canvas**: pointer to a canvas object
- **points**: point of the polygon
- **point\_cnt**: number of points
- **style**: style of the polygon (**body.main\_color** and **body.opa** is used)

void **lv\_canvas\_draw\_arc**(*lv\_obj\_t* \**canvas*, lv\_coord\_t *x*, lv\_coord\_t *y*, lv\_coord\_t *r*, int32\_t *start\_angle*, int32\_t *end\_angle*, **const** lv\_style\_t \**style*)

Draw an arc on the canvas

### Parameters

- **canvas**: pointer to a canvas object
- **x**: origo x of the arc
- **y**: origo y of the arc
- **r**: radius of the arc
- **start\_angle**: start angle in degrees
- **end\_angle**: end angle in degrees
- **style**: style of the polygon (**body.main\_color** and **body.opa** is used)

**struct lv\_canvas\_ext\_t**

### Public Members

*lv\_img\_ext\_t* **img**

*lv\_img\_dsc\_t* **dsc**

## Case à cocher (lv\_cb)

### Vue d' ensemble

Les objets case à cocher sont construits à partir d' un *bouton* en arrière-plan qui contient un second bouton (la marque) et une *étiquette* pour créer une case à cocher classique.

### Texte

Le texte peut être modifié par la fonction **lv\_cb\_set\_text(cb, "Nouveau texte")**. Le texte est alloué dynamiquement.

Pour définir un texte statique utilisez **lv\_cb\_set\_static\_text(cb, txt)**. De cette façon, seul un pointeur vers **txt** sera sauvegardé et il ne doit pas être désalloué tant que la case à cocher existe.

### Cocher/décocher

Vous pouvez manuellement cocher/décocher la case à cocher via **lv\_cb\_set\_checked(cb, true/false)**. La valeur **true** coche la case à cocher, la valeur **false** la décoche.

## Désactiver

Pour désactiver la case à cocher utilisez `lv_cb_set_inactive(cb, true)`.

## Styles

Les styles de case à cocher peuvent être modifiés avec `lv_cb_set_style(cb, LV_CB_STYLE_..., &style)`.

- **LV\_CB\_STYLE\_BG** - Style d'arrière-plan. Utilise toutes les propriétés `style.body`. Le style de l'étiquette provient de `style.text`. Défaut : `lv_style_transp`.
- **LV\_CB\_STYLE\_BOX\_REL** - Style de la marque décochée relâchée. Utilise les propriétés `style.body`. Défaut : `lv_style_btn_rel`.
- **LV\_CB\_STYLE\_BOX\_PR** - Style de la marque décochée pressée. Utilise les propriétés `style.body`. Défaut : `lv_style_btn_pr`.
- **LV\_CB\_STYLE\_BOX\_TGL\_REL** - Style de la marque cochée relâchée. Utilise les propriétés `style.body`. Défaut : `lv_style_btn_tgl_rel`.
- **LV\_CB\_STYLE\_BOX\_TGL\_PR** - Style de la marque cochée pressée. Utilise les propriétés `style.body`. Défaut : `lv_style_btn_tgl_pr`.
- **LV\_CB\_STYLE\_BOX\_INA** - Style de la marque désactivée. Utilise les propriétés `style.body`. Défaut : `lv_style_btn_ina`.

## Événements

Outre les [événements génériques](/overview/event.html #evenements-generiques), les événements spéciaux suivants sont envoyés par les case à cocher :

- **LV\_EVENT\_VALUE\_CHANGED** - Envoyé lorsque le bouton image est basculé.

Notez que les événements génériques liés au périphérique d'entrée (tels que `LV_EVENT_PRESSED`) sont également envoyés dans l'état désactivé. Vous devez vérifier l'état avec `lv_cb_is_inactive(cb)` pour ignorer les événements des cases à cocher désactivées.

Apprenez-en plus sur les *événements*.

## Touches

Les *touches* suivantes sont traitées par les 'boutons' :

- **LV\_KEY\_RIGHT/UP** - Passe à l'état bascule pressé si le mode bascule est actif
- **LV\_KEY\_LEFT/DOWN** - Passe à l'état bascule relâché si le mode bascule est actif

Notez que, comme d'habitude, l'état de `LV_KEY_ENTER` est traduit en `LV_EVENT_PRESSED/PRESSING/RELEASED` etc.

Apprenez-en plus sur les *touches*.

## Exemple

### C

#### Simple Checkbox



code

```
#include "lvgl/lvgl.h"
#include <stdio.h>

static void event_handler(lv_obj_t * obj, lv_event_t event)
{
    if(event == LV_EVENT_VALUE_CHANGED) {
        printf("State: %s\n", lv_cb_is_checked(obj) ? "Checked" : "Unchecked");
    }
}

void lv_ex_cb_1(void)
{
    lv_obj_t * cb = lv_cb_create(lv_scr_act(), NULL);
    lv_cb_set_text(cb, "I agree to terms and conditions.");
    lv_obj_align(cb, NULL, LV_ALIGN_CENTER, 0, 0);
    lv_obj_set_event_cb(cb, event_handler);
}
```

### MicroPython

## Simple Checkbox



code

```
def event_handler(obj, event):
    if event == lv.EVENT.VALUE_CHANGED:
        print("State: %s" % ("Checked" if obj.is_checked() else "Unchecked"))

cb = lv.cb(lv.scr_act())
cb.set_text("I agree to terms and conditions.")
cb.align(None, lv.ALIGN.CENTER, 0, 0)
cb.set_event_cb(event_handler)
```

## API

### Typedefs

**typedef** uint8\_t **lv\_cb\_style\_t**

### Enums

**enum** [anonymous]  
Checkbox styles.

*Values:*

**LV\_CB\_STYLE\_BG**  
Style of object background.

**LV\_CB\_STYLE\_BOX\_REL**  
Style of box (released).

**LV\_CB\_STYLE\_BOX\_PR**  
Style of box (pressed).



## LV\_CB\_STYLE\_BOX\_TGL\_REL

Style of box (released but checked).

## LV\_CB\_STYLE\_BOX\_TGL\_PR

Style of box (pressed and checked).

## LV\_CB\_STYLE\_BOX\_INA

Style of disabled box

## Functions

*lv\_obj\_t* \***lv\_cb\_create**(*lv\_obj\_t* \**par*, **const** *lv\_obj\_t* \**copy*)

Create a check box objects

**Return** pointer to the created check box

### Parameters

- **par**: pointer to an object, it will be the parent of the new check box
- **copy**: pointer to a check box object, if not NULL then the new object will be copied from it

void **lv\_cb\_set\_text**(*lv\_obj\_t* \**cb*, **const** char \**txt*)

Set the text of a check box. **txt** will be copied and may be deallocated after this function returns.

### Parameters

- **cb**: pointer to a check box
- **txt**: the text of the check box. NULL to refresh with the current text.

void **lv\_cb\_set\_static\_text**(*lv\_obj\_t* \**cb*, **const** char \**txt*)

Set the text of a check box. **txt** must not be deallocated during the life of this checkbox.

### Parameters

- **cb**: pointer to a check box
- **txt**: the text of the check box. NULL to refresh with the current text.

**static** void **lv\_cb\_set\_checked**(*lv\_obj\_t* \**cb*, bool *checked*)

Set the state of the check box

### Parameters

- **cb**: pointer to a check box object
- **checked**: true: make the check box checked; false: make it unchecked

**static** void **lv\_cb\_set\_inactive**(*lv\_obj\_t* \**cb*)

Make the check box inactive (disabled)

### Parameters

- **cb**: pointer to a check box object

void **lv\_cb\_set\_style**(*lv\_obj\_t* \**cb*, *lv\_cb\_style\_t* *type*, **const** *lv\_style\_t* \**style*)

Set a style of a check box

### Parameters

- **cb**: pointer to check box object
- **type**: which style should be set
- **style**: pointer to a style

**const** char \***lv\_cb\_get\_text**(const *lv\_obj\_t* \*cb)

Get the text of a check box

**Return** pointer to the text of the check box

**Parameters**

- **cb**: pointer to check box object

**static** bool **lv\_cb\_is\_checked**(const *lv\_obj\_t* \*cb)

Get the current state of the check box

**Return** true: checked; false: not checked

**Parameters**

- **cb**: pointer to a check box object

**static** bool **lv\_cb\_is\_inactive**(const *lv\_obj\_t* \*cb)

Get whether the check box is inactive or not.

**Return** true: inactive; false: not inactive

**Parameters**

- **cb**: pointer to a check box object

**const** *lv\_style\_t* \***lv\_cb\_get\_style**(const *lv\_obj\_t* \*cb, *lv\_cb\_style\_t* type)

Get a style of a button

**Return** style pointer to the style

**Parameters**

- **cb**: pointer to check box object
- **type**: which style should be get

**struct** **lv\_cb\_ext\_t**

**Public Members**

*lv\_btn\_ext\_t* **bg\_btn**

*lv\_obj\_t* \***bullet**

*lv\_obj\_t* \***label**

**Graphique (lv\_chart)**

**Vue d' ensemble**

Charts consist of the following:

- A background
- Horizontal and vertical division lines
- Data series, which can be represented with points, lines, columns, or filled areas.

## Série de données

You can add any number of series to the charts by `lv_chart_add_series(chart, color)`. It allocates data for a `lv_chart_series_t` structure which contains the chosen `color` and an array for the data points.

## Type de série

The following **data display types** exist:

- **LV\_CHART\_TYPE\_NONE** - Do not display any data. It can be used to hide a series.
- **LV\_CHART\_TYPE\_LINE** - Draw lines between the points.
- **LV\_CHART\_TYPE\_COL** - Draw columns.
- **LV\_CHART\_TYPE\_POINT** - Draw points.
- **LV\_CHART\_TYPE\_AREA** - Draw areas (fill the area below the lines).
- **LV\_CHART\_TYPE\_VERTICAL\_LINE** - Draw only vertical lines to connect the points. Useful if the chart width is equal to the number of points, because it can redraw much faster than the **LV\_CHART\_TYPE\_AREA**.

Vous pouvez spécifier le type de données avec `lv_chart_set_type(chart, LV_CHART_TYPE_...)`. Les types peuvent être combinés par 'OU' (comme `LV_CHART_TYPE_LINE | LV_CHART_TYPE_POINT`).

## Modifier le données

Vous avez plusieurs possibilités pour définir les données de la série :

1. Définir les valeurs manuellement dans le tableau comme `ser1->points[3] = 7` et actualiser le graphique avec `lv_chart_refresh(chart)`.
2. Use the `lv_chart_set_next(chart, ser, value)`.
3. Initialiser tous les points avec une valeur donnée : `lv_chart_init_points(chart, ser, value)`.
4. Définir tous les points à partir d'un tableau : `lv_chart_set_points(chart, ser, value_array)`.

Use `LV_CHART_POINT_DEF` as value to make the library skip drawing that point, column, or line segment.

## Modes de mise à jour

`lv_chart_set_next` can behave in two ways depending on *update mode*:

- **LV\_CHART\_UPDATE\_MODE\_SHIFT** - Shift old data to the left and add the new one on the right.
- **LV\_CHART\_UPDATE\_MODE\_CIRCULAR** - Circularly add the new data (Like an ECG diagram).

The update mode can be changed with `lv_chart_set_update_mode(chart, LV_CHART_UPDATE_MODE_...)`.

## Nombre de points

Le nombre de points de la série peut être modifié par `lv_chart_set_point_count(chart, point_num)`. La valeur par défaut est 10.

## Plage verticale

You can specify the minimum and maximum values in y-direction with `lv_chart_set_range(chart, y_min, y_max)`. The value of the points will be scaled proportionally. The default range is: 0..100.

## Quadrillage

Le nombre de lignes horizontales et verticales du quadrillage peut être modifié par `lv_chart_set_div_line_count(chart, hdiv_num, vdiv_num)`. Les valeurs par défaut sont 3 lignes horizontales et 5 lignes verticales.

Apparence de la série To set the **line width** and **point radius** of the series, use the `lv_chart_set_series_width(chart, size)` function. The default value is 2.

The **opacity of the data lines** can be specified by `lv_chart_set_series_opa(chart, opa)`. The default value is `LV_OPA_COVER`.

You can apply a **dark color fade** on the bottom of columns and points by `lv_chart_set_series_darking(chart, effect)` function. The default dark level is `LV_OPA_50`.

## Graduation et étiquettes

Ticks and labels beside them can be added.

**`lv_chart_set_margin(chart, 20)`** needs to be used to add some extra space around the chart for the ticks and texts. Otherwise, you will not see them at all. You may need to adjust the number 20 depending on your requirements.

`lv_chart_set_x_tick_text(chart, list_of_values, num_tick_marks, LV_CHART_AXIS_...)` définit les graduations et les textes sur l'axe des x. `list_of_values` est une chaîne de textes pour les graduations délimités par des `'\n'` (excepté le dernier). P.ex. `const char * list_of_values = "premier\ndeuxième\ntroisième"`. `list_of_values` peut être `NULL`. Si `list_of_values` est défini alors `num_tick_marks` indique le nombre de graduations entre deux étiquettes. Si `list_of_values` est `NULL` alors il spécifie le nombre total de graduations.

*Major tick lines* are drawn where text is placed, and *minor tick lines* are drawn elsewhere. `lv_chart_set_x_tick_length(chart, major_tick_len, minor_tick_len)` sets the length of tick lines on the x-axis.

The same functions exists for the y axis too: `lv_chart_set_y_tick_text` and `lv_chart_set_y_tick_length`.

## Styles

Vous pouvez définir les styles avec `lv_chart_set_style(btn, LV_CHART_STYLE_MAIN, &style)`.

- **style.body** - properties set the background's appearance.
- **style.line** - properties set the division lines' appearance.

- `style.text` - properties set the axis labels' appearance.

## Événements

Seuls les *événements génériques* sont envoyés par ce type d' objet.

Apprenez-en plus sur les *événements*.

## Touches

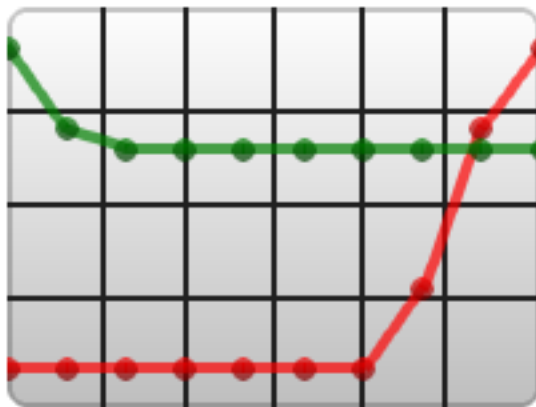
Aucune *touche* n' est traitée par ce type d' objet.

Apprenez-en plus sur les *touches*.

## Exemple

### C

#### Line Chart



code

```
#include "lvgl/lvgl.h"

void lv_ex_chart_1(void)
{
    /*Create a chart*/
    lv_obj_t * chart;
    chart = lv_chart_create(lv_scr_act(), NULL);
    lv_obj_set_size(chart, 200, 150);
}
```

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```

lv_obj_align(chart, NULL, LV_ALIGN_CENTER, 0, 0);
lv_chart_set_type(chart, LV_CHART_TYPE_POINT | LV_CHART_TYPE_LINE);  /*Show
↪lines and points too*/
lv_chart_set_series_opa(chart, LV_OPA_70);                          /*Opacity
↪of the data series*/
lv_chart_set_series_width(chart, 4);                                /*Line
↪width and point radius*/

lv_chart_set_range(chart, 0, 100);

/*Add two data series*/
lv_chart_series_t * ser1 = lv_chart_add_series(chart, LV_COLOR_RED);
lv_chart_series_t * ser2 = lv_chart_add_series(chart, LV_COLOR_GREEN);

/*Set the next points on 'dl1'*/
lv_chart_set_next(chart, ser1, 10);
lv_chart_set_next(chart, ser1, 10);
lv_chart_set_next(chart, ser1, 10);
lv_chart_set_next(chart, ser1, 10);
lv_chart_set_next(chart, ser1, 10);
lv_chart_set_next(chart, ser1, 10);
lv_chart_set_next(chart, ser1, 10);
lv_chart_set_next(chart, ser1, 30);
lv_chart_set_next(chart, ser1, 70);
lv_chart_set_next(chart, ser1, 90);

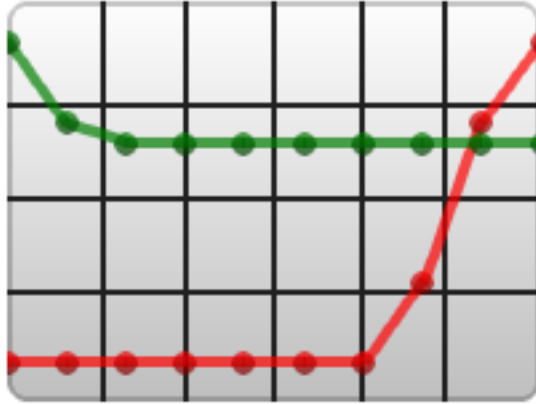
/*Directly set points on 'dl2'*/
ser2->points[0] = 90;
ser2->points[1] = 70;
ser2->points[2] = 65;
ser2->points[3] = 65;
ser2->points[4] = 65;
ser2->points[5] = 65;
ser2->points[6] = 65;
ser2->points[7] = 65;
ser2->points[8] = 65;
ser2->points[9] = 65;

lv_chart_refresh(chart); /*Required after direct set*/
}

```

## MicroPython

## Line Chart



code

```
# Create a chart
chart = lv.chart(lv.scr_act())
chart.set_size(200, 150)
chart.align(None, lv.ALIGN.CENTER, 0, 0)
chart.set_type(lv.chart.TYPE.POINT | lv.chart.TYPE.LINE) # Show lines and points too
chart.set_series_opa(lv.OPA._70) # Opacity of the data
↪series
chart.set_series_width(4) # Line width and point
↪radius

chart.set_range(0, 100)

# Add two data series
ser1 = chart.add_series(lv.color_make(0xFF,0,0))
ser2 = chart.add_series(lv.color_make(0,0x80,0))

# Set points on 'dl1'
chart.set_points(ser1, [10, 10, 10, 10, 10, 10, 10, 30, 70, 90])

# Set points on 'dl2'
chart.set_points(ser2, [90, 70, 65, 65, 65, 65, 65, 65, 65, 65])
```

## API

### Typedefs

```
typedef uint8_t lv_chart_type_t
```

```
typedef uint8_t lv_chart_update_mode_t
```

```
typedef uint8_t lv_chart_axis_options_t
typedef uint8_t lv_chart_style_t
```

## Enums

**enum** [anonymous]

Chart types

*Values:*

**LV\_CHART\_TYPE\_NONE** = 0x00

Don't draw the series

**LV\_CHART\_TYPE\_LINE** = 0x01

Connect the points with lines

**LV\_CHART\_TYPE\_COLUMN** = 0x02

Draw columns

**LV\_CHART\_TYPE\_POINT** = 0x04

Draw circles on the points

**LV\_CHART\_TYPE\_VERTICAL\_LINE** = 0x08

Draw vertical lines on points (useful when chart width == point count)

**LV\_CHART\_TYPE\_AREA** = 0x10

Draw area chart

**enum** [anonymous]

Chart update mode for `lv_chart_set_next`

*Values:*

**LV\_CHART\_UPDATE\_MODE\_SHIFT**

Shift old data to the left and add the new one on the right

**LV\_CHART\_UPDATE\_MODE\_CIRCULAR**

Add the new data in a circular way

**enum** [anonymous]

Data of axis

*Values:*

**LV\_CHART\_AXIS\_SKIP\_LAST\_TICK** = 0x00

don't draw the last tick

**LV\_CHART\_AXIS\_DRAW\_LAST\_TICK** = 0x01

draw the last tick

**LV\_CHART\_AXIS\_INVERSE\_LABELS\_ORDER** = 0x02

draw tick labels in an inversed order

**enum** [anonymous]

*Values:*

**LV\_CHART\_STYLE\_MAIN**



## Functions

**LV\_EXPORT\_CONST\_INT**(LV\_CHART\_POINT\_DEF)

**LV\_EXPORT\_CONST\_INT**(LV\_CHART\_TICK\_LENGTH\_AUTO)

*lv\_obj\_t* \***lv\_chart\_create**(*lv\_obj\_t* \*par, const *lv\_obj\_t* \*copy)

Create a chart background objects

**Return** pointer to the created chart background

### Parameters

- **par**: pointer to an object, it will be the parent of the new chart background
- **copy**: pointer to a chart background object, if not NULL then the new object will be copied from it

*lv\_chart\_series\_t* \***lv\_chart\_add\_series**(*lv\_obj\_t* \*chart, *lv\_color\_t* color)

Allocate and add a data series to the chart

**Return** pointer to the allocated data series

### Parameters

- **chart**: pointer to a chart object
- **color**: color of the data series

void **lv\_chart\_clear\_serie**(*lv\_obj\_t* \*chart, *lv\_chart\_series\_t* \*serie)

Clear the point of a serie

### Parameters

- **chart**: pointer to a chart object
- **serie**: pointer to the chart' s serie to clear

void **lv\_chart\_set\_div\_line\_count**(*lv\_obj\_t* \*chart, uint8\_t hdiv, uint8\_t vdiv)

Set the number of horizontal and vertical division lines

### Parameters

- **chart**: pointer to a graph background object
- **hdiv**: number of horizontal division lines
- **vdiv**: number of vertical division lines

void **lv\_chart\_set\_range**(*lv\_obj\_t* \*chart, lv\_coord\_t ymin, lv\_coord\_t ymax)

Set the minimal and maximal y values

### Parameters

- **chart**: pointer to a graph background object
- **ymin**: y minimum value
- **ymax**: y maximum value

void **lv\_chart\_set\_type**(*lv\_obj\_t* \*chart, *lv\_chart\_type\_t* type)

Set a new type for a chart

### Parameters

- **chart**: pointer to a chart object
- **type**: new type of the chart (from 'lv\_chart\_type\_t' enum)

void **lv\_chart\_set\_point\_count**(*lv\_obj\_t* \*chart, uint16\_t point\_cnt)

Set the number of points on a data line on a chart

**Parameters**

- **chart**: pointer to chart object
- **point\_cnt**: new number of points on the data lines

void **lv\_chart\_set\_series\_opa**(*lv\_obj\_t* \*chart, *lv\_opa\_t* opa)

Set the opacity of the data series

**Parameters**

- **chart**: pointer to a chart object
- **opa**: opacity of the data series

void **lv\_chart\_set\_series\_width**(*lv\_obj\_t* \*chart, lv\_coord\_t width)

Set the line width or point radius of the data series

**Parameters**

- **chart**: pointer to a chart object
- **width**: the new width

void **lv\_chart\_set\_series\_darking**(*lv\_obj\_t* \*chart, *lv\_opa\_t* dark\_eff)

Set the dark effect on the bottom of the points or columns

**Parameters**

- **chart**: pointer to a chart object
- **dark\_eff**: dark effect level (LV\_OPA\_TRANSP to turn off)

void **lv\_chart\_init\_points**(*lv\_obj\_t* \*chart, *lv\_chart\_series\_t* \*ser, lv\_coord\_t y)

Initialize all data points with a value

**Parameters**

- **chart**: pointer to chart object
- **ser**: pointer to a data series on 'chart'
- **y**: the new value for all points

void **lv\_chart\_set\_points**(*lv\_obj\_t* \*chart, *lv\_chart\_series\_t* \*ser, lv\_coord\_t y\_array[])

Set the value of points from an array

**Parameters**

- **chart**: pointer to chart object
- **ser**: pointer to a data series on 'chart'
- **y\_array**: array of 'lv\_coord\_t' points (with 'points count' elements)

void **lv\_chart\_set\_next**(*lv\_obj\_t* \*chart, *lv\_chart\_series\_t* \*ser, lv\_coord\_t y)

Shift all data right and set the most right data on a data line

**Parameters**

- **chart**: pointer to chart object
- **ser**: pointer to a data series on 'chart'
- **y**: the new value of the most right data

void **lv\_chart\_set\_update\_mode**(*lv\_obj\_t* \*chart, *lv\_chart\_update\_mode\_t* update\_mode)  
 Set update mode of the chart object.

**Parameters**

- **chart**: pointer to a chart object
- **update**: mode

static void **lv\_chart\_set\_style**(*lv\_obj\_t* \*chart, *lv\_chart\_style\_t* type, const *lv\_style\_t* \*style)

Set the style of a chart

**Parameters**

- **chart**: pointer to a chart object
- **type**: which style should be set (can be only LV\_CHART\_STYLE\_MAIN)
- **style**: pointer to a style

void **lv\_chart\_set\_x\_tick\_length**(*lv\_obj\_t* \*chart, uint8\_t major\_tick\_len, uint8\_t minor\_tick\_len)

Set the length of the tick marks on the x axis

**Parameters**

- **chart**: pointer to the chart
- **major\_tick\_len**: the length of the major tick or LV\_CHART\_TICK\_LENGTH\_AUTO to set automatically (where labels are added)
- **minor\_tick\_len**: the length of the minor tick, LV\_CHART\_TICK\_LENGTH\_AUTO to set automatically (where no labels are added)

void **lv\_chart\_set\_y\_tick\_length**(*lv\_obj\_t* \*chart, uint8\_t major\_tick\_len, uint8\_t minor\_tick\_len)

Set the length of the tick marks on the y axis

**Parameters**

- **chart**: pointer to the chart
- **major\_tick\_len**: the length of the major tick or LV\_CHART\_TICK\_LENGTH\_AUTO to set automatically (where labels are added)
- **minor\_tick\_len**: the length of the minor tick, LV\_CHART\_TICK\_LENGTH\_AUTO to set automatically (where no labels are added)

void **lv\_chart\_set\_secondary\_y\_tick\_length**(*lv\_obj\_t* \*chart, uint8\_t major\_tick\_len, uint8\_t minor\_tick\_len)

Set the length of the tick marks on the secondary y axis

**Parameters**

- **chart**: pointer to the chart
- **major\_tick\_len**: the length of the major tick or LV\_CHART\_TICK\_LENGTH\_AUTO to set automatically (where labels are added)
- **minor\_tick\_len**: the length of the minor tick, LV\_CHART\_TICK\_LENGTH\_AUTO to set automatically (where no labels are added)

void **lv\_chart\_set\_x\_tick\_texts**(*lv\_obj\_t* \*chart, const char \*list\_of\_values, uint8\_t num\_tick\_marks, *lv\_chart\_axis\_options\_t* options)

Set the x-axis tick count and labels of a chart

#### Parameters

- **chart**: pointer to a chart object
- **list\_of\_values**: list of string values, terminated with `,` except the last
- **num\_tick\_marks**: if **list\_of\_values** is NULL: total number of ticks per axis else number of ticks between two value labels
- **options**: extra options

```
void lv_chart_set_secondary_y_tick_texts(lv_obj_t *chart, const char
                                         *list_of_values, uint8_t num_tick_marks,
                                         lv_chart_axis_options_t options)
```

Set the secondary y-axis tick count and labels of a chart

#### Parameters

- **chart**: pointer to a chart object
- **list\_of\_values**: list of string values, terminated with `,` except the last
- **num\_tick\_marks**: if **list\_of\_values** is NULL: total number of ticks per axis else number of ticks between two value labels
- **options**: extra options

```
void lv_chart_set_y_tick_texts(lv_obj_t *chart, const char *list_of_values, uint8_t
                               num_tick_marks, lv_chart_axis_options_t options)
```

Set the y-axis tick count and labels of a chart

#### Parameters

- **chart**: pointer to a chart object
- **list\_of\_values**: list of string values, terminated with `,` except the last
- **num\_tick\_marks**: if **list\_of\_values** is NULL: total number of ticks per axis else number of ticks between two value labels
- **options**: extra options

```
void lv_chart_set_margin(lv_obj_t *chart, uint16_t margin)
```

Set the margin around the chart, used for axes value and ticks

#### Parameters

- **chart**: pointer to an chart object
- **margin**: value of the margin [px]

```
lv_chart_type_t lv_chart_get_type(const lv_obj_t *chart)
```

Get the type of a chart

**Return** type of the chart (from `'lv_chart_t'` enum)

#### Parameters

- **chart**: pointer to chart object

```
uint16_t lv_chart_get_point_cnt(const lv_obj_t *chart)
```

Get the data point number per data line on chart

**Return** point number on each data line

#### Parameters

- **chart**: pointer to chart object

*lv\_opa\_t* **lv\_chart\_get\_series\_opa**(const *lv\_obj\_t* \*chart)

Get the opacity of the data series

**Return** the opacity of the data series

**Parameters**

- **chart**: pointer to chart object

*lv\_coord\_t* **lv\_chart\_get\_series\_width**(const *lv\_obj\_t* \*chart)

Get the data series width

**Return** the width the data series (lines or points)

**Parameters**

- **chart**: pointer to chart object

*lv\_opa\_t* **lv\_chart\_get\_series\_darking**(const *lv\_obj\_t* \*chart)

Get the dark effect level on the bottom of the points or columns

**Return** dark effect level (LV\_OPA\_TRANSP to turn off)

**Parameters**

- **chart**: pointer to chart object

**static const** *lv\_style\_t* \***lv\_chart\_get\_style**(const *lv\_obj\_t* \*chart, *lv\_chart\_style\_t* type)

Get the style of an chart object

**Return** pointer to the chart' s style

**Parameters**

- **chart**: pointer to an chart object
- **type**: which style should be get (can be only LV\_CHART\_STYLE\_MAIN)

*uint16\_t* **lv\_chart\_get\_margin**(*lv\_obj\_t* \*chart)

Get the margin around the chart, used for axes value and labels

**Parameters**

- **chart**: pointer to an chart object
- **return**: value of the margin

**void** **lv\_chart\_refresh**(*lv\_obj\_t* \*chart)

Refresh a chart if its data line has changed

**Parameters**

- **chart**: pointer to chart object

**struct** **lv\_chart\_series\_t**

**Public Members**

*lv\_coord\_t* \***points**

*lv\_color\_t* **color**

*uint16\_t* **start\_point**

**struct** **lv\_chart\_axis\_cfg\_t**

## Public Members

```

const char *list_of_values
lv_chart_axis_options_t options
uint8_t num_tick_marks
uint8_t major_tick_len
uint8_t minor_tick_len
struct lv_chart_ext_t

```

## Public Members

```

lv_ll_t series_ll
lv_coord_t ymin
lv_coord_t ymax
uint8_t hdiv_cnt
uint8_t vdiv_cnt
uint16_t point_cnt
lv_chart_type_t type
lv_chart_axis_cfg_t y_axis
lv_chart_axis_cfg_t x_axis
lv_chart_axis_cfg_t secondary_y_axis
uint16_t margin
uint8_t update_mode
lv_coord_t width
uint8_t num
lv_opa_t opa
lv_opa_t dark
struct lv_chart_ext_t::[anonymous] series

```

## Conteneur (lv\_cont)

### Vue d' ensemble

The containers are essentially a **basic object** with some special features.

### Mise en page

Vous pouvez appliquer une mise en page aux conteneurs pour disposer automatiquement leurs enfants. L'espacement des éléments provient des propriétés `style.body.padding. ...`. Les options de mise en page possibles sont :

- **LV\_LAYOUT\_OFF** - Do not align the children.
- **LV\_LAYOUT\_CENTER** - Align children to the center in column and keep **padding.inner** space between them.
- **LV\_LAYOUT\_COL** - Align children in a left-justified column. Keep **padding.left** space on the left, **padding.top** space on the top and **padding.inner** space between the children.
- **LV\_LAYOUT\_COL\_M** - Align children in centered column. Keep **padding.top** space on the top and **padding.inner** space between the children.
- **LV\_LAYOUT\_COL\_R** - Align children in a right-justified column. Keep **padding.right** space on the right, **padding.top** space on the top and **padding.inner** space between the children.
- **LV\_LAYOUT\_ROW\_T** - Align children in a top justified row. Keep **padding.left** space on the left, **padding.top** space on the top and **padding.inner** space between the children.
- **LV\_LAYOUT\_ROW\_M** - Align children in centered row. Keep **padding.left** space on the left and **padding.inner** space between the children.
- **LV\_LAYOUT\_ROW\_B** - Align children in a bottom justified row. Keep **padding.left** space on the left, **padding.bottom** space on the bottom and **padding.inner** space between the children.
- **LV\_LAYOUT\_PRETTY** - Put as many objects as possible in a row (with at least **padding.inner** space and **padding.left/right** space on the sides). Divide the space in each line equally between the children. Conserve les espaces **padding.top** en haut et **padding.inner** entre les lignes,
- **LV\_LAYOUT\_GRID** - Similar to **LV\_LAYOUT\_PRETTY** but not divide horizontal space equally just let **padding.left/right** on the edges and **padding.inner** space between the elements.

## Autofit

Containers have an autofit feature which can automatically change the size of the container according to its children and/or parent. The following options exist:

- **LV\_FIT\_NONE** - Do not change the size automatically.
- **LV\_FIT\_TIGHT** - Shrink-wrap the container around all of its children, while keeping **padding.top/bottom/left/right** space on the edges.
- **LV\_FIT\_FLOOD** - Set the size to the parent's size minus **padding.top/bottom/left/right** (from the parent's style) space.
- **LV\_FIT\_FILL** - Use **LV\_FIT\_FLOOD** while smaller than the parent and **LV\_FIT\_TIGHT** when larger. It will ensure that the container is, at minimum, the size of its parent.

To set the auto fit mode for all directions, use `lv_cont_set_fit(cont, LV_FIT_...)`. To use different auto fit horizontally and vertically, use `lv_cont_set_fit2(cont, hor_fit_type, ver_fit_type)`. To use different auto fit in all 4 directions, use `lv_cont_set_fit4(cont, left_fit_type, right_fit_type, top_fit_type, bottom_fit_type)`.

## Styles

You can set the styles with `lv_cont_set_style(btn, LV_CONT_STYLE_MAIN, &style)`.

- **style.body** est utilisé.

## Événements

Only the [Generic events](#) are sent by the object type.

Apprenez-en plus sur les [événements](#).

## Touches

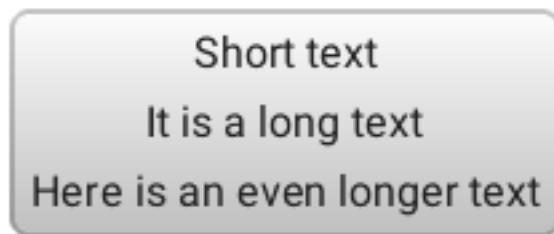
Aucune *touche* n' est traitée par ce type d' objet.

Apprenez-en plus sur les [touches](#).

## Exemple

### C

#### Container with auto-fit



code

```
#include "lvgl/lvgl.h"

void lv_ex_cont_1(void)
{
    lv_obj_t * cont;

    cont = lv_cont_create(lv_scr_act(), NULL);
    lv_obj_set_auto_realign(cont, true);           /*Auto realign when the
↪size changes*/
    lv_obj_align_origo(cont, NULL, LV_ALIGN_CENTER, 0, 0); /*This parametrs will be
↪sued when realigned*/
    lv_cont_set_fit(cont, LV_FIT_TIGHT);
    lv_cont_set_layout(cont, LV_LAYOUT_COL_M);
}
```

(continues on next page)



(continued from previous page)

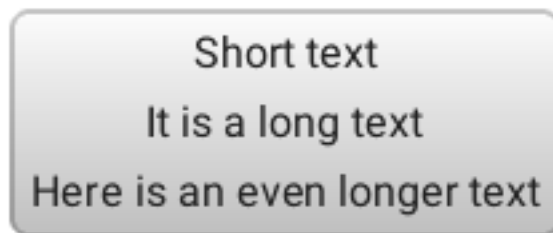
```
lv_obj_t * label;
label = lv_label_create(cont, NULL);
lv_label_set_text(label, "Short text");

label = lv_label_create(cont, NULL);
lv_label_set_text(label, "It is a long text");

label = lv_label_create(cont, NULL);
lv_label_set_text(label, "Here is an even longer text");
}
```

## MicroPython

### Container with auto-fit



code

```
cont = lv.cont(lv.scr_act())
cont.set_auto_realign(True) # Auto realign when the size changes
cont.align_origo(None, lv.ALIGN.CENTER, 0, 0) # This parametrs will be sued when
↪realigned
cont.set_fit(lv.FIT.TIGHT)
cont.set_layout(lv.LAYOUT.COL_M)

label = lv.label(cont)
label.set_text("Short text")

label = lv.label(cont)
label.set_text("It is a long text")

label = lv.label(cont)
label.set_text("Here is an even longer text")
```

## API

### Typedefs

**typedef** uint8\_t **lv\_layout\_t**

**typedef** uint8\_t **lv\_fit\_t**

**typedef** uint8\_t **lv\_cont\_style\_t**

### Enums

**enum** [anonymous]

Container layout options

*Values:*

**LV\_LAYOUT\_OFF** = 0

No layout

**LV\_LAYOUT\_CENTER**

Center objects

**LV\_LAYOUT\_COL\_L**

Column left align

**LV\_LAYOUT\_COL\_M**

Column middle align

**LV\_LAYOUT\_COL\_R**

Column right align

**LV\_LAYOUT\_ROW\_T**

Row top align

**LV\_LAYOUT\_ROW\_M**

Row middle align

**LV\_LAYOUT\_ROW\_B**

Row bottom align

**LV\_LAYOUT\_PRETTY**

Put as many object as possible in row and begin a new row

**LV\_LAYOUT\_GRID**

Align same-sized object into a grid

**\_LV\_LAYOUT\_NUM**

**enum** [anonymous]

How to resize the container around the children.

*Values:*

**LV\_FIT\_NONE**

Do not change the size automatically

**LV\_FIT\_TIGHT**

Shrink wrap around the children

**LV\_FIT\_FLOOD**

Align the size to the parent' s edge

## LV\_FIT\_FILL

Align the size to the parent' s edge first but if there is an object out of it then get larger

## \_LV\_FIT\_NUM

**enum** [anonymous]

Values:

## LV\_CONT\_STYLE\_MAIN

## Functions

*lv\_obj\_t* \***lv\_cont\_create**(*lv\_obj\_t* \*par, const *lv\_obj\_t* \*copy)

Create a container objects

**Return** pointer to the created container

### Parameters

- **par**: pointer to an object, it will be the parent of the new container
- **copy**: pointer to a container object, if not NULL then the new object will be copied from it

void **lv\_cont\_set\_layout**(*lv\_obj\_t* \*cont, *lv\_layout\_t* layout)

Set a layout on a container

### Parameters

- **cont**: pointer to a container object
- **layout**: a layout from 'lv\_cont\_layout\_t'

void **lv\_cont\_set\_fit4**(*lv\_obj\_t* \*cont, *lv\_fit\_t* left, *lv\_fit\_t* right, *lv\_fit\_t* top, *lv\_fit\_t* bottom)

Set the fit policy in all 4 directions separately. It tell how to change the container' s size automatically.

### Parameters

- **cont**: pointer to a container object
- **left**: left fit policy from *lv\_fit\_t*
- **right**: right fit policy from *lv\_fit\_t*
- **top**: top fit policy from *lv\_fit\_t*
- **bottom**: bottom fit policy from *lv\_fit\_t*

**static** void **lv\_cont\_set\_fit2**(*lv\_obj\_t* \*cont, *lv\_fit\_t* hor, *lv\_fit\_t* ver)

Set the fit policy horizontally and vertically separately. It tells how to change the container' s size automatically.

### Parameters

- **cont**: pointer to a container object
- **hor**: horizontal fit policy from *lv\_fit\_t*
- **ver**: vertical fit policy from *lv\_fit\_t*

**static** void **lv\_cont\_set\_fit**(*lv\_obj\_t* \*cont, *lv\_fit\_t* fit)

Set the fit policy in all 4 direction at once. It tells how to change the container' s size automatically.

### Parameters

- **cont**: pointer to a container object
- **fit**: fit policy from *lv\_fit\_t*

**static void lv\_cont\_set\_style**(*lv\_obj\_t* \*cont, *lv\_cont\_style\_t* type, **const** *lv\_style\_t* \*style)

Set the style of a container

**Parameters**

- **cont**: pointer to a container object
- **type**: which style should be set (can be only LV\_CONT\_STYLE\_MAIN)
- **style**: pointer to the new style

*lv\_layout\_t* **lv\_cont\_get\_layout**(**const** *lv\_obj\_t* \*cont)

Get the layout of a container

**Return** the layout from 'lv\_cont\_layout\_t'

**Parameters**

- **cont**: pointer to container object

*lv\_fit\_t* **lv\_cont\_get\_fit\_left**(**const** *lv\_obj\_t* \*cont)

Get left fit mode of a container

**Return** an element of *lv\_fit\_t*

**Parameters**

- **cont**: pointer to a container object

*lv\_fit\_t* **lv\_cont\_get\_fit\_right**(**const** *lv\_obj\_t* \*cont)

Get right fit mode of a container

**Return** an element of *lv\_fit\_t*

**Parameters**

- **cont**: pointer to a container object

*lv\_fit\_t* **lv\_cont\_get\_fit\_top**(**const** *lv\_obj\_t* \*cont)

Get top fit mode of a container

**Return** an element of *lv\_fit\_t*

**Parameters**

- **cont**: pointer to a container object

*lv\_fit\_t* **lv\_cont\_get\_fit\_bottom**(**const** *lv\_obj\_t* \*cont)

Get bottom fit mode of a container

**Return** an element of *lv\_fit\_t*

**Parameters**

- **cont**: pointer to a container object

**static const** *lv\_style\_t* \***lv\_cont\_get\_style**(**const** *lv\_obj\_t* \*cont, *lv\_cont\_style\_t* type)

Get the style of a container

**Return** pointer to the container's style

**Parameters**

- **cont**: pointer to a container object
- **type**: which style should be get (can be only LV\_CONT\_STYLE\_MAIN)

**struct lv\_cont\_ext\_t**

## Public Members

```
uint8_t layout
uint8_t fit_left
uint8_t fit_right
uint8_t fit_top
uint8_t fit_bottom
```

## Color picker (lv\_cpicker)

### Overview

The *color picker* object **draws a color band and knob** that enable users to **choose a color' s hue, saturation, and/or value**.

### Types of color pickers

The color band of a *color picker* can currently be drawn in two ways:

- As a linear bar (LV\_CPICKER\_TYPE\_RECT).
- As a circular ring (LV\_CPICKER\_TYPE\_DISC).

You can switch between these modes with `lv_cpicker_set_type(cpicker, type)`.

### Notes

In circular mode, the **width and height** of the *color picker* should be the **same**.

### Styles

To set the style of a *color picker* object, use `lv_cpicker_set_style(cpicker, LV_CPICKER_STYLE_XXX, &style)`. XXX can either be **MAIN** or **INDICATOR**, which represent the color band and knob, respectively.

- **line.width** - the thickness of the color ring (in **DISC** mode)
- **body.[main/grad]\_color** - the background color of the color picker

### Events

Besides the [Generic events](#) the following [Special events](#) are sent by color pickers:

- **LV\_EVENT\_VALUE\_CHANGED** - sent when the color changes.

Learn more about [Events](#).

## Keys

No *Keys* are processed by the object type.

Learn more about *Keys*.

## Example

There is no official example available for this object type yet, but here is some sample test code:

```
const lv_coord_t pickerSize = 200;

/* Set the style of the color ring */
static lv_style_t styleMain;
lv_style_copy(&styleMain, &lv_style_plain);
styleMain.line.width = 30;
/* Make the background white */
styleMain.body.main_color = styleMain.body.grad_color = LV_COLOR_WHITE;

/* Set the style of the knob */
static lv_style_t styleIndicator;
lv_style_copy(&styleIndicator, &lv_style_pretty);
styleIndicator.body.border.color = LV_COLOR_WHITE;
/* Ensure that the knob is fully opaque */
styleIndicator.body.opa = LV_OPA_COVER;
styleIndicator.body.border.opa = LV_OPA_COVER;

lv_obj_t * scr = lv_scr_act();

lv_obj_t * colorPicker = lv_cpicker_create(scr, NULL);
lv_obj_set_size(colorPicker, pickerSize, pickerSize);
/* Choose the 'DISC' type */
lv_cpicker_set_type(colorPicker, LV_CPICKER_TYPE_DISC);
lv_obj_align(colorPicker, NULL, LV_ALIGN_CENTER, 0, 0);
/* Set the styles */
lv_cpicker_set_style(colorPicker, LV_CPICKER_STYLE_MAIN, &styleMain);
lv_cpicker_set_style(colorPicker, LV_CPICKER_STYLE_INDICATOR, &styleIndicator);
/* Change the knob's color to that of the selected color */
lv_cpicker_set_indic_colored(colorPicker, true);
```

## API

### Typedefs

```
typedef uint8_t lv_cpicker_type_t
typedef uint8_t lv_cpicker_color_mode_t
typedef uint8_t lv_cpicker_style_t
```

### Enums

```
enum [anonymous]
    Values:
```

**LV\_CPICKER\_TYPE\_RECT**

**LV\_CPICKER\_TYPE\_DISC**

**enum** [anonymous]

*Values:*

**LV\_CPICKER\_COLOR\_MODE\_HUE**

**LV\_CPICKER\_COLOR\_MODE\_SATURATION**

**LV\_CPICKER\_COLOR\_MODE\_VALUE**

**enum** [anonymous]

*Values:*

**LV\_CPICKER\_STYLE\_MAIN**

**LV\_CPICKER\_STYLE\_INDICATOR**

## Functions

*lv\_obj\_t* \***lv\_cpicker\_create**(*lv\_obj\_t* \*par, const *lv\_obj\_t* \*copy)

Create a colorpicker objects

**Return** pointer to the created colorpicker

**Parameters**

- **par**: pointer to an object, it will be the parent of the new colorpicker
- **copy**: pointer to a colorpicker object, if not NULL then the new object will be copied from it

void **lv\_cpicker\_set\_type**(*lv\_obj\_t* \*cpicker, *lv\_cpicker\_type\_t* type)

Set a new type for a colorpicker

**Parameters**

- **cpicker**: pointer to a colorpicker object
- **type**: new type of the colorpicker (from 'lv\_cpicker\_type\_t' enum)

void **lv\_cpicker\_set\_style**(*lv\_obj\_t* \*cpicker, *lv\_cpicker\_style\_t* type, *lv\_style\_t* \*style)

Set a style of a colorpicker.

**Parameters**

- **cpicker**: pointer to colorpicker object
- **type**: which style should be set
- **style**: pointer to a style

bool **lv\_cpicker\_set\_hue**(*lv\_obj\_t* \*cpicker, uint16\_t hue)

Set the current hue of a colorpicker.

**Return** true if changed, otherwise false

**Parameters**

- **cpicker**: pointer to colorpicker object
- **hue**: current selected hue [0..360]

bool **lv\_cpicker\_set\_saturation**(*lv\_obj\_t* \*cpicker, uint8\_t saturation)

Set the current saturation of a colorpicker.

**Return** true if changed, otherwise false

**Parameters**

- **cpicker**: pointer to colorpicker object
- **saturation**: current selected saturation [0..100]

bool **lv\_cpicker\_set\_value**(*lv\_obj\_t* \*cpicker, uint8\_t val)  
Set the current value of a colorpicker.

**Return** true if changed, otherwise false

**Parameters**

- **cpicker**: pointer to colorpicker object
- **val**: current selected value [0..100]

bool **lv\_cpicker\_set\_hsv**(*lv\_obj\_t* \*cpicker, *lv\_color\_hsv\_t* hsv)  
Set the current hsv of a colorpicker.

**Return** true if changed, otherwise false

**Parameters**

- **cpicker**: pointer to colorpicker object
- **hsv**: current selected hsv

bool **lv\_cpicker\_set\_color**(*lv\_obj\_t* \*cpicker, *lv\_color\_t* color)  
Set the current color of a colorpicker.

**Return** true if changed, otherwise false

**Parameters**

- **cpicker**: pointer to colorpicker object
- **color**: current selected color

void **lv\_cpicker\_set\_color\_mode**(*lv\_obj\_t* \*cpicker, *lv\_cpicker\_color\_mode\_t* mode)  
Set the current color mode.

**Parameters**

- **cpicker**: pointer to colorpicker object
- **mode**: color mode (hue/sat/val)

void **lv\_cpicker\_set\_color\_mode\_fixed**(*lv\_obj\_t* \*cpicker, bool fixed)  
Set if the color mode is changed on long press on center

**Parameters**

- **cpicker**: pointer to colorpicker object
- **fixed**: color mode cannot be changed on long press

void **lv\_cpicker\_set\_indic\_colored**(*lv\_obj\_t* \*cpicker, bool en)  
Make the indicator to be colored to the current color

**Parameters**

- **cpicker**: pointer to colorpicker object
- **en**: true: color the indicator; false: not color the indicator



void **lv\_cpicker\_set\_preview**(*lv\_obj\_t* \*cpicker, bool en)

Add a color preview in the middle of the DISC type color picker

**Parameters**

- **cpicker**: pointer to colorpicker object
- **en**: true: enable preview; false: disable preview

*lv\_cpicker\_color\_mode\_t* **lv\_cpicker\_get\_color\_mode**(*lv\_obj\_t* \*cpicker)

Get the current color mode.

**Return** color mode (hue/sat/val)

**Parameters**

- **cpicker**: pointer to colorpicker object

bool **lv\_cpicker\_get\_color\_mode\_fixed**(*lv\_obj\_t* \*cpicker)

Get if the color mode is changed on long press on center

**Return** mode cannot be changed on long press

**Parameters**

- **cpicker**: pointer to colorpicker object

const *lv\_style\_t* \***lv\_cpicker\_get\_style**(const *lv\_obj\_t* \*cpicker, *lv\_cpicker\_style\_t* type)

Get style of a colorpicker.

**Return** pointer to the style

**Parameters**

- **cpicker**: pointer to colorpicker object
- **type**: which style should be get

uint16\_t **lv\_cpicker\_get\_hue**(*lv\_obj\_t* \*cpicker)

Get the current hue of a colorpicker.

**Return** current selected hue

**Parameters**

- **cpicker**: pointer to colorpicker object

uint8\_t **lv\_cpicker\_get\_saturation**(*lv\_obj\_t* \*cpicker)

Get the current saturation of a colorpicker.

**Return** current selected saturation

**Parameters**

- **cpicker**: pointer to colorpicker object

uint8\_t **lv\_cpicker\_get\_value**(*lv\_obj\_t* \*cpicker)

Get the current hue of a colorpicker.

**Return** current selected value

**Parameters**

- **cpicker**: pointer to colorpicker object

*lv\_color\_hsv\_t* **lv\_cpicker\_get\_hsv**(*lv\_obj\_t* \*cpicker)

Get the current selected hsv of a colorpicker.

**Return** current selected hsv

#### Parameters

- `cpicker`: pointer to colorpicker object

*lv\_color\_t* **lv\_cpicker\_get\_color**(*lv\_obj\_t* \**cpicker*)

Get the current selected color of a colorpicker.

**Return** current selected color

#### Parameters

- `cpicker`: pointer to colorpicker object

bool **lv\_cpicker\_get\_indic\_colored**(*lv\_obj\_t* \**cpicker*)

Whether the indicator is colored to the current color or not

**Return** true: color the indicator; false: not color the indicator

#### Parameters

- `cpicker`: pointer to colorpicker object

bool **lv\_cpicker\_get\_preview**(*lv\_obj\_t* \**cpicker*)

Whether the preview is enabled or not

**Return** en true: preview is enabled; false: preview is disabled

#### Parameters

- `cpicker`: pointer to colorpicker object

**struct lv\_cpicker\_ext\_t**

#### Public Members

*lv\_color\_hsv\_t* **hsv**

*lv\_style\_t* \***style**

*lv\_point\_t* **pos**

uint8\_t **colored**

**struct** *lv\_cpicker\_ext\_t*::[anonymous] **indic**

uint32\_t **last\_click\_time**

uint32\_t **last\_change\_time**

*lv\_point\_t* **last\_press\_point**

*lv\_cpicker\_color\_mode\_t* **color\_mode**

uint8\_t **color\_mode\_fixed**

*lv\_cpicker\_type\_t* **type**

uint8\_t **preview**

### Drop-down list (lv\_ddlist)

#### Vue d' ensemble

The drop-down list allows the user to select one value from a list. The drop-down list is closed (inactive) by default. When a drop-down list is inactive, it displays a single value. When activated (by click on the

drop-down list), it displays a list of values from which the user may select one. When the user selects a new value, the drop-down list reverts to the inactive state and displays the new value.

### Définir les éléments

The options are passed to the drop-down list as a string with `lv_ddlist_set_options(ddlist, options)`. The options should be separated by `\n`. For example: "First\nSecond\nThird".

Vous pouvez sélectionner un élément manuellement avec `lv_ddlist_set_selected(ddlist, id)`, où *id* est l' index d' un élément.

### Obtenir l' élément sélectionné

To get the currently selected option, use `lv_ddlist_get_selected(ddlist)`. It will return the *index* of the selected option.

`lv_ddlist_get_selected_str(ddlist, buf, buf_size)` copies the name of the selected option to a *buf*.

### Aligner les éléments

To align the label horizontally, use `lv_ddlist_set_align(ddlist, LV_LABEL_ALIGN_LEFT/CENTER/RIGHT)`.

### Hauteur et largeur

By default, the list's height is adjusted automatically to show all options. The `lv_ddlist_set_fix_height(ddlist, height)` sets a fixed height for the opened list. The user can put `0` to use auto height.

The width is also adjusted automatically. To prevent this, apply `lv_ddlist_set_fix_width(ddlist, width)`. The user can put `0` to use auto width.

### Barres de défilement

Similarly to [Page](#) with fix height, the drop-down list supports various scrollbar display modes. It can be set by `lv_ddlist_set_sb_mode(ddlist, LV_SB_MODE_...)`.

### Durée d' animation

The drop-down list's open/close animation time is adjusted by `lv_ddlist_set_anim_time(ddlist, anim_time)`. Zero animation time means no animation.

### Flèche décorative

A down arrow can be added to the left side of the drop-down list with `lv_ddlist_set_draw_arrow(ddlist, true)`.

## Manually open/close

To manually open or close the drop-down list the `lv_ddlist_open/close(ddlist)` function can be used.

## Rester ouvert

You can force the drop-down list to **stay opened**, when an option is selected with `lv_ddlist_set_stay_open(ddlist, true)`.

## Styles

The `lv_ddlist_set_style(ddlist, LV_DDLIST_STYLE_..., &style)` set the styles of a drop-down list.

- **LV\_DDLIST\_STYLE\_BG** - Style of the background. All `style.body` properties are used. `style.text` is used for the option's label. Default: `lv_style_pretty`.
- **LV\_DDLIST\_STYLE\_SEL** - Style of the selected option. The `style.body` properties are used. The selected option will be recolored with `text.color`. Default: `lv_style_plain_color`.
- **LV\_DDLIST\_STYLE\_SB** - Style of the scrollbar. The `style.body` properties are used. Default: `lv_style_plain_color`.

## Événements

Besides the [Generic events](#), the following [Special events](#) are sent by the drop-down list:

- **LV\_EVENT\_VALUE\_CHANGED** - Sent when the new option is selected.

Apprenez-en plus sur les [événements](#).

## Touches

Les *touches* suivantes sont traitées par les listes déroulantes :

- **LV\_KEY\_RIGHT/DOWN** - Select the next option.
- **LV\_KEY\_LEFT/UP** - Select the previous option.
- **LV\_KEY\_ENTER** - Apply the selected option (Send `LV_EVENT_VALUE_CHANGED` event and close the drop-down list).

## Exemple

C

## Simple Drop down list



code

```
#include "lvgl/lvgl.h"
#include <stdio.h>

static void event_handler(lv_obj_t * obj, lv_event_t event)
{
    if(event == LV_EVENT_VALUE_CHANGED) {
        char buf[32];
        lv_ddlist_get_selected_str(obj, buf, sizeof(buf));
        printf("Option: %s\n", buf);
    }
}

void lv_ex_ddlist_1(void)
{
    /*Create a drop down list*/
    lv_obj_t * ddlist = lv_ddlist_create(lv_scr_act(), NULL);
    lv_ddlist_set_options(ddlist, "Apple\n"
        "Banana\n"
        "Orange\n"
        "Melon\n"
        "Grape\n"
        "Raspberry");

    lv_ddlist_set_fix_width(ddlist, 150);
    lv_ddlist_set_draw_arrow(ddlist, true);
    lv_obj_align(ddlist, NULL, LV_ALIGN_IN_TOP_MID, 0, 20);
    lv_obj_set_event_cb(ddlist, event_handler);
}
```

## Drop “up” list



|

code

```
#include "lvgl/lvgl.h"
#include <stdio.h>

/**
 * Create a drop UP list by applying auto realign
 */
void lv_ex_ddlist_2(void)
{
    /*Create a drop down list*/
    lv_obj_t * ddlist = lv_ddlist_create(lv_scr_act(), NULL);
    lv_ddlist_set_options(ddlist, "Apple\n"
        "Banana\n"
        "Orange\n"
        "Melon\n"
        "Grape\n"
        "Raspberry");

    lv_ddlist_set_fix_width(ddlist, 150);
    lv_ddlist_set_fix_height(ddlist, 150);
    lv_ddlist_set_draw_arrow(ddlist, true);

    /* Enable auto-realign when the size changes.
     * It will keep the bottom of the ddlist fixed*/
    lv_obj_set_auto_realign(ddlist, true);

    /*It will be called automatically when the size changes*/
    lv_obj_align(ddlist, NULL, LV_ALIGN_IN_BOTTOM_MID, 0, -20);
}
```

## MicroPython

### Simple Drop down list



code

```
def event_handler(obj, event):
    if event == lv.EVENT.VALUE_CHANGED:
        option = " " * 10 # should be large enough to store the option
        obj.get_selected_str(option, len(option))
        # .strip() removes trailing spaces
        print("Option: \"%s\"" % option.strip())

# Create a drop down list
ddlist = lv.ddlist(lv.scr_act())
ddlist.set_options("\n".join([
    "Apple",
    "Banana",
    "Orange",
    "Melon",
    "Grape",
    "Raspberry"]))

ddlist.set_fix_width(150)
ddlist.set_draw_arrow(True)
ddlist.align(None, lv.ALIGN.IN_TOP_MID, 0, 20)
ddlist.set_event_cb(event_handler)
```

## Drop “up” list



|

code

```
# Create a drop UP list by applying auto realign

# Create a drop down list
ddlist = lv.ddlist(lv.scr_act())
ddlist.set_options("\n".join([
    "Apple",
    "Banana",
    "Orange",
    "Melon",
    "Grape",
    "Raspberry"]))

ddlist.set_fix_width(150)
ddlist.set_fix_height(150)
ddlist.set_draw_arrow(True)

# Enable auto-realign when the size changes.
# It will keep the bottom of the ddlist fixed
ddlist.set_auto_realign(True)

# It will be called automatically when the size changes
ddlist.align(None, lv.ALIGN.IN_BOTTOM_MID, 0, -20)
```

## API

### Typedefs

```
typedef uint8_t lv_ddlist_style_t
```



## Enums

**enum** [anonymous]

*Values:*

**LV\_DDLIST\_STYLE\_BG**  
**LV\_DDLIST\_STYLE\_SEL**  
**LV\_DDLIST\_STYLE\_SB**

## Functions

*lv\_obj\_t* \***lv\_ddlist\_create**(*lv\_obj\_t* \*par, const *lv\_obj\_t* \*copy)

Create a drop down list objects

**Return** pointer to the created drop down list

**Parameters**

- **par**: pointer to an object, it will be the parent of the new drop down list
- **copy**: pointer to a drop down list object, if not NULL then the new object will be copied from it

void **lv\_ddlist\_set\_options**(*lv\_obj\_t* \*ddlist, const char \*options)

Set the options in a drop down list from a string

**Parameters**

- **ddlist**: pointer to drop down list object
- **options**: a string with " separated options. E.g. "One\nTwo\nThree"

void **lv\_ddlist\_set\_selected**(*lv\_obj\_t* \*ddlist, uint16\_t sel\_opt)

Set the selected option

**Parameters**

- **ddlist**: pointer to drop down list object
- **sel\_opt**: id of the selected option (0 ...number of option - 1);

void **lv\_ddlist\_set\_fix\_height**(*lv\_obj\_t* \*ddlist, lv\_coord\_t h)

Set a fix height for the drop down list If 0 then the opened ddlist will be auto. sized else the set height will be applied.

**Parameters**

- **ddlist**: pointer to a drop down list
- **h**: the height when the list is opened (0: auto size)

void **lv\_ddlist\_set\_fix\_width**(*lv\_obj\_t* \*ddlist, lv\_coord\_t w)

Set a fix width for the drop down list

**Parameters**

- **ddlist**: pointer to a drop down list
- **w**: the width when the list is opened (0: auto size)

void **lv\_ddlist\_set\_draw\_arrow**(*lv\_obj\_t* \*ddlist, bool en)

Set arrow draw in a drop down list

**Parameters**

- **ddlist**: pointer to drop down list object
- **en**: enable/disable a arrow draw. E.g. “true” for draw.

void **lv\_ddlist\_set\_stay\_open**(*lv\_obj\_t* \*ddlist, bool en)

Leave the list opened when a new value is selected

#### Parameters

- **ddlist**: pointer to drop down list object
- **en**: enable/disable “stay open” feature

**static** void **lv\_ddlist\_set\_sb\_mode**(*lv\_obj\_t* \*ddlist, *lv\_sb\_mode\_t* mode)

Set the scroll bar mode of a drop down list

#### Parameters

- **ddlist**: pointer to a drop down list object
- **sb\_mode**: the new mode from ‘lv\_page\_sb\_mode\_t’ enum

**static** void **lv\_ddlist\_set\_anim\_time**(*lv\_obj\_t* \*ddlist, *uint16\_t* anim\_time)

Set the open/close animation time.

#### Parameters

- **ddlist**: pointer to a drop down list
- **anim\_time**: open/close animation time [ms]

void **lv\_ddlist\_set\_style**(*lv\_obj\_t* \*ddlist, *lv\_ddlist\_style\_t* type, **const** *lv\_style\_t* \*style)

Set a style of a drop down list

#### Parameters

- **ddlist**: pointer to a drop down list object
- **type**: which style should be set
- **style**: pointer to a style

void **lv\_ddlist\_set\_align**(*lv\_obj\_t* \*ddlist, *lv\_label\_align\_t* align)

Set the alignment of the labels in a drop down list

#### Parameters

- **ddlist**: pointer to a drop down list object
- **align**: alignment of labels

**const** char \***lv\_ddlist\_get\_options**(**const** *lv\_obj\_t* \*ddlist)

Get the options of a drop down list

**Return** the options separated by “ -s (E.g. “Option1\nOption2\nOption3” )

#### Parameters

- **ddlist**: pointer to drop down list object

*uint16\_t* **lv\_ddlist\_get\_selected**(**const** *lv\_obj\_t* \*ddlist)

Get the selected option

**Return** id of the selected option (0 ...number of option - 1);

#### Parameters

- **ddlist**: pointer to drop down list object

void **lv\_ddlist\_get\_selected\_str**(const *lv\_obj\_t* \**ddlist*, char \**buf*, uint16\_t *buf\_size*)  
Get the current selected option as a string

**Parameters**

- *ddlist*: pointer to ddlist object
- *buf*: pointer to an array to store the string
- *buf\_size*: size of *buf* in bytes. 0: to ignore it.

lv\_coord\_t **lv\_ddlist\_get\_fix\_height**(const *lv\_obj\_t* \**ddlist*)  
Get the fix height value.

**Return** the height if the ddlist is opened (0: auto size)

**Parameters**

- *ddlist*: pointer to a drop down list object

bool **lv\_ddlist\_get\_draw\_arrow**(*lv\_obj\_t* \**ddlist*)  
Get arrow draw in a drop down list

**Parameters**

- *ddlist*: pointer to drop down list object

bool **lv\_ddlist\_get\_stay\_open**(*lv\_obj\_t* \**ddlist*)  
Get whether the drop down list stay open after selecting a value or not

**Parameters**

- *ddlist*: pointer to drop down list object

static *lv\_sb\_mode\_t* **lv\_ddlist\_get\_sb\_mode**(const *lv\_obj\_t* \**ddlist*)  
Get the scroll bar mode of a drop down list

**Return** scrollbar mode from ‘lv\_page\_sb\_mode\_t’ enum

**Parameters**

- *ddlist*: pointer to a drop down list object

static uint16\_t **lv\_ddlist\_get\_anim\_time**(const *lv\_obj\_t* \**ddlist*)  
Get the open/close animation time.

**Return** open/close animation time [ms]

**Parameters**

- *ddlist*: pointer to a drop down list

const *lv\_style\_t* \***lv\_ddlist\_get\_style**(const *lv\_obj\_t* \**ddlist*, *lv\_ddlist\_style\_t* *type*)  
Get a style of a drop down list

**Return** style pointer to a style

**Parameters**

- *ddlist*: pointer to a drop down list object
- *type*: which style should be get

*lv\_label\_align\_t* **lv\_ddlist\_get\_align**(const *lv\_obj\_t* \**ddlist*)  
Get the alignment of the labels in a drop down list

**Return** alignment of labels

**Parameters**

- **ddlist**: pointer to a drop down list object

void **lv\_ddlist\_open**(*lv\_obj\_t* \*ddlist, *lv\_anim\_enable\_t* anim)

Open the drop down list with or without animation

#### Parameters

- **ddlist**: pointer to drop down list object
- **anim\_en**: LV\_ANIM\_ON: use animation; LV\_ANOM\_OFF: not use animations

void **lv\_ddlist\_close**(*lv\_obj\_t* \*ddlist, *lv\_anim\_enable\_t* anim)

Close (Collapse) the drop down list

#### Parameters

- **ddlist**: pointer to drop down list object
- **anim\_en**: LV\_ANIM\_ON: use animation; LV\_ANOM\_OFF: not use animations

**struct lv\_ddlist\_ext\_t**

#### Public Members

*lv\_page\_ext\_t* **page**

*lv\_obj\_t* \***label**

**const** lv\_style\_t \***sel\_style**

uint16\_t **option\_cnt**

uint16\_t **sel\_opt\_id**

uint16\_t **sel\_opt\_id\_ori**

uint8\_t **opened**

uint8\_t **force\_sel**

uint8\_t **draw\_arrow**

uint8\_t **stay\_open**

lv\_coord\_t **fix\_height**

### Jauge (lv\_gauge)

#### Vue d' ensemble

La jauge est semi-circulaire, présente une échelle graduée, des étiquettes et des aiguilles.

#### Scale

You can use the **lv\_gauge\_set\_scale**(gauge, angle, line\_num, label\_cnt) function to adjust the scale angle and the number of the scale lines and labels. Les paramètres par défaut sont 220 degrés, 21 graduations et 6 étiquettes.

## Aiguilles

The gauge can show more than one needle. Utilisez la fonction `lv_gauge_set_needle_count(gauge, needle_num, color_array)` pour définir le nombre d' aiguilles et un tableau de couleurs pour chaque aiguille. Le tableau doit être une variable statique ou globale car seul son pointeur est sauvegardé.

Vous pouvez utiliser `lv_gauge_set_value(gauge, needle_id, value)` pour définir une aiguille.

## Plage

La plage de la jauge peut être spécifiée par `lv_gauge_set_range(gauge, min, max)`. La plage par défaut est 0..100.

## Valeur critique

To set a critical value, use `lv_gauge_set_critical_value(gauge, value)`. The scale color will be changed to `line.color` after this value. (default: 80)

## Styles

The gauge uses one style at a time which can be set by `lv_gauge_set_style(gauge, LV_GAUGE_STYLE_MAIN, &style)`. The gauge's properties are derived from the following style attributes:

- **body.main\_color** - Line's color at the beginning of the scale.
- **body.grad\_color** - Line's color at the end of the scale (gradient with main color).
- **body.padding.left** - Line length.
- **body.padding.inner** - Label distance from the scale lines.
- **body.radius** - Radius of needle origin circle.
- **line.width** - Line width.
- **line.color** - Line's color after the critical value.
- **text.font/color/letter\_space** - Label attributes.

## Événements

Seuls les [événements génériques](#) sont envoyés par ce type d' objet.

Apprenez-en plus sur les [événements](#).

## Touches

Aucune *touche* n' est traitée par ce type d' objet.

Apprenez-en plus sur les [touches](#).

## Exemple

### C

#### Simple Gauge



code

```
#include "lvgl/lvgl.h"

void lv_ex_gauge_1(void)
{
    /*Create a style*/
    static lv_style_t style;
    lv_style_copy(&style, &lv_style_pretty_color);
    style.body.main_color = lv_color_hex3(0x666); /*Line color at the beginning*/
    style.body.grad_color = lv_color_hex3(0x666); /*Line color at the end*/
    style.body.padding.left = 10; /*Scale line length*/
    style.body.padding.inner = 8; /*Scale label padding*/
    style.body.border.color = lv_color_hex3(0x333); /*Needle middle circle color*/
    style.line.width = 3;
    style.text.color = lv_color_hex3(0x333);
    style.line.color = LV_COLOR_RED; /*Line color after the critical value*/

    /*Describe the color for the needles*/
    static lv_color_t needle_colors[3];
    needle_colors[0] = LV_COLOR_BLUE;
    needle_colors[1] = LV_COLOR_ORANGE;
    needle_colors[2] = LV_COLOR_PURPLE;

    /*Create a gauge*/
    lv_obj_t * gauge1 = lv_gauge_create(lv_scr_act(), NULL);
```

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```

lv_gauge_set_style(gauge1, LV_GAUGE_STYLE_MAIN, &style);
lv_gauge_set_needle_count(gauge1, 3, needle_colors);
lv_obj_set_size(gauge1, 150, 150);
lv_obj_align(gauge1, NULL, LV_ALIGN_CENTER, 0, 20);

/*Set the values*/
lv_gauge_set_value(gauge1, 0, 10);
lv_gauge_set_value(gauge1, 1, 20);
lv_gauge_set_value(gauge1, 2, 30);
}

```

## MicroPython

### Simple Gauge



code

```

# Create a style
style = lv.style_t()
lv.style_copy(style, lv.style_pretty_color)
style.body.main_color = lv.color_hex3(0x666) # Line color at the beginning
style.body.grad_color = lv.color_hex3(0x666) # Line color at the end
style.body.padding.left = 10 # Scale line length
style.body.padding.inner = 8 # Scale label padding
style.body.border.color = lv.color_hex3(0x333) # Needle middle circle color
style.line.width = 3
style.text.color = lv.color_hex3(0x333)
style.line.color = lv.color_hex3(0xF00) # Line color after the critical value

# Describe the color for the needles
needle_colors = [

```

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```

    lv.color_make(0x00, 0x00, 0xFF),
    lv.color_make(0xFF, 0xA5, 0x00),
    lv.color_make(0x80, 0x00, 0x80)
]

# Create a gauge
gauge1 = lv.gauge(lv.scr_act())
gauge1.set_style(lv.gauge.STYLE.MAIN, style)
gauge1.set_needle_count(len(needle_colors), needle_colors)
gauge1.set_size(150, 150)
gauge1.align(None, lv.ALIGN.CENTER, 0, 20)

# Set the values
gauge1.set_value(0, 10)
gauge1.set_value(1, 20)
gauge1.set_value(2, 30)

```

## API

### Typedefs

**typedef** uint8\_t **lv\_gauge\_style\_t**

### Enums

**enum** [anonymous]

*Values:*

**LV\_GAUGE\_STYLE\_MAIN**

### Functions

*lv\_obj\_t* \***lv\_gauge\_create**(*lv\_obj\_t* \*par, **const** *lv\_obj\_t* \*copy)

Create a gauge objects

**Return** pointer to the created gauge

**Parameters**

- **par**: pointer to an object, it will be the parent of the new gauge
- **copy**: pointer to a gauge object, if not NULL then the new object will be copied from it

void **lv\_gauge\_set\_needle\_count**(*lv\_obj\_t* \*gauge, uint8\_t needle\_cnt, **const** *lv\_color\_t* colors[])

Set the number of needles

**Parameters**

- **gauge**: pointer to gauge object
- **needle\_cnt**: new count of needles
- **colors**: an array of colors for needles (with 'num' elements)

void **lv\_gauge\_set\_value**(*lv\_obj\_t* \*gauge, uint8\_t needle\_id, int16\_t value)

Set the value of a needle



#### Parameters

- **gauge**: pointer to a gauge
- **needle\_id**: the id of the needle
- **value**: the new value

**static void lv\_gauge\_set\_range**(*lv\_obj\_t* \*gauge, int16\_t min, int16\_t max)  
Set minimum and the maximum values of a gauge

#### Parameters

- **gauge**: pointer to the gauge object
- **min**: minimum value
- **max**: maximum value

**static void lv\_gauge\_set\_critical\_value**(*lv\_obj\_t* \*gauge, int16\_t value)  
Set a critical value on the scale. After this value 'line.color' scale lines will be drawn

#### Parameters

- **gauge**: pointer to a gauge object
- **value**: the critical value

**void lv\_gauge\_set\_scale**(*lv\_obj\_t* \*gauge, uint16\_t angle, uint8\_t line\_cnt, uint8\_t label\_cnt)  
Set the scale settings of a gauge

#### Parameters

- **gauge**: pointer to a gauge object
- **angle**: angle of the scale (0..360)
- **line\_cnt**: count of scale lines. The get a given "subdivision" lines between label, **line\_cnt** = (sub\_div + 1) \* (label\_cnt - 1) + 1
- **label\_cnt**: count of scale labels.

**static void lv\_gauge\_set\_style**(*lv\_obj\_t* \*gauge, *lv\_gauge\_style\_t* type, lv\_style\_t \*style)  
Set the styles of a gauge

#### Parameters

- **gauge**: pointer to a gauge object
- **type**: which style should be set (can be only LV\_GAUGE\_STYLE\_MAIN)
- **style**: set the style of the gauge

**int16\_t lv\_gauge\_get\_value**(const *lv\_obj\_t* \*gauge, uint8\_t needle)  
Get the value of a needle

**Return** the value of the needle [min,max]

#### Parameters

- **gauge**: pointer to gauge object
- **needle**: the id of the needle

**uint8\_t lv\_gauge\_get\_needle\_count**(const *lv\_obj\_t* \*gauge)  
Get the count of needles on a gauge

**Return** count of needles

#### Parameters

- `gauge`: pointer to gauge

**static** int16\_t **lv\_gauge\_get\_min\_value**(const lv\_obj\_t \*lmeter)

Get the minimum value of a gauge

**Return** the minimum value of the gauge

#### Parameters

- `gauge`: pointer to a gauge object

**static** int16\_t **lv\_gauge\_get\_max\_value**(const lv\_obj\_t \*lmeter)

Get the maximum value of a gauge

**Return** the maximum value of the gauge

#### Parameters

- `gauge`: pointer to a gauge object

**static** int16\_t **lv\_gauge\_get\_critical\_value**(const lv\_obj\_t \*gauge)

Get a critical value on the scale.

**Return** the critical value

#### Parameters

- `gauge`: pointer to a gauge object

uint8\_t **lv\_gauge\_get\_label\_count**(const lv\_obj\_t \*gauge)

Set the number of labels (and the thicker lines too)

**Return** count of labels

#### Parameters

- `gauge`: pointer to a gauge object

**static** uint16\_t **lv\_gauge\_get\_line\_count**(const lv\_obj\_t \*gauge)

Get the scale number of a gauge

**Return** number of the scale units

#### Parameters

- `gauge`: pointer to a gauge object

**static** uint16\_t **lv\_gauge\_get\_scale\_angle**(const lv\_obj\_t \*gauge)

Get the scale angle of a gauge

**Return** angle of the scale

#### Parameters

- `gauge`: pointer to a gauge object

**static** const lv\_style\_t \***lv\_gauge\_get\_style**(const lv\_obj\_t \*gauge, lv\_gauge\_style\_t type)

Get the style of a gauge

**Return** pointer to the gauge' s style

#### Parameters

- `gauge`: pointer to a gauge object
- `type`: which style should be get (can be only LV\_GAUGE\_STYLE\_MAIN)

## struct lv\_gauge\_ext\_t

### Public Members

```

lv_lmeter_ext_t lmeter
int16_t *values
const lv_color_t *needle_colors
uint8_t needle_count
uint8_t label_count

```

## Image (lv\_img)

### Vue d' ensemble

‘Images’ are the basic object to display images.

### Image source

To provide maximum flexibility, the source of the image can be:

- a variable in the code (a C array with the pixels).
- a file stored externally (like on an SD card).
- a text with *Symbols*.

To set the source of an image, use `lv_img_set_src(img, src)`.

To generate a **pixel array** from a PNG, JPG or BMP image, use the [Online image converter tool](#) and set the converted image with its pointer: `lv_img_set_src(img1, &converted_img_var)`; To make the variable visible in the C file, you need to declare it with `LV_IMG_DECLARE(converted_img_var)`.

To use **external files**, you also need to convert the image files using the online converter tool but now you should select the binary Output format. Vous devez également utiliser le module de système de fichiers de LittlevGL et enregistrer un pilote avec certaines fonctions pour le fonctionnement de base des fichiers. Allez dans *Système de fichiers* pour en savoir plus. To set an image sourced from a file, use `lv_img_set_src(img, "S:folder1/my_img.bin")`.

You can set a **symbol** similarly to *Labels*. In this case, the image will be rendered as text according to the *font* specified in the style. It enables to use of light-weighted mono-color “letters” instead of real images. You can set symbol like `lv_img_set_src(img1, LV_SYMBOL_OK)`.

### Etiquette comme image

Images and labels are sometimes used to convey the same thing. For example, to describe what a button does. Therefore, images and labels are somewhat interchangeable. To handle these images can even display texts by using `LV_SYMBOL_DUMMY` as the prefix of the text. For example, `lv_img_set_src(img, LV_SYMBOL_DUMMY "Some text")`.

## Transparence

Les images internes (variables) et externes prennent en charge 2 méthodes de traitement de la transparence :

- **Chrome keying** - Pixels with `LV_COLOR_TRANSP` (*lv\_conf.h*) color will be transparent.
- **Alpha byte** - An alpha byte is added to every pixel.

## Palette et index alpha

Besides *True color* (RGB) color format, the following formats are also supported:

- **Indexed** - Image has a palette.
- **Alpha indexed** - Only alpha values are stored.

These options can be selected in the font converter. To learn more about the color formats, read the *Images* section.

## Coloration

The images can be re-colored in run-time to any color according to the brightness of the pixels. It is very useful to show different states (selected, inactive, pressed, etc.) of an image without storing more versions of the same image. This feature can be enabled in the style by setting `img.intense` between `LV_OPA_TRANSP` (no recolor, value: 0) and `LV_OPA_COVER` (full recolor, value: 255). La valeur par défaut est `LV_OPA_TRANSP`, cette fonctionnalité est donc désactivée.

## Taille automatique

It is possible to automatically set the size of the image object to the image source' s width and height if enabled by the `lv_img_set_auto_size(image, true)` function. If *auto-size* is enabled, then when a new file is set, the object size is automatically changed. Later, you can modify the size manually. The *auto-size* is enabled by default if the image is not a screen.

## Mosaïque

If the object size is greater than the image size in any directions, then the image will be repeated like a mosaic. It' s a very useful feature to create a large image from only a very narrow source. Par exemple, vous pouvez avoir une image *300 x 1* avec un dégradé spécial et la définir comme fond d' écran à l' aide de la fonction mosaïque.

## Décalage

With `lv_img_set_offset_x(img, x_ofs)` and `lv_img_set_offset_y(img, y_ofs)`, you can add some offset to the displayed image. It is useful if the object size is smaller than the image source size. Using the offset parameter a *Texture atlas* or a “running image” effect can be created by *Animating* the x or y offset.

## Styles

The images uses one style at a time which can be set by `lv_img_set_style(lmeter, LV_IMG_STYLE_MAIN, &style)`. All the `style.image` properties are used:

- **image.intense** - Intensity of recoloring (0..255 or `LV_OPA_...`).
- **image.color** - Color for recoloring or color of the alpha indexed images.
- **image.opa** - Overall opacity of image.

When the image object displays a text then `style.text` properties are used. See [Label](#) for more information.

Le style par défaut des images est `NULL` donc elles **héritent du style du parent**.

## Événements

Seuls les [événements génériques](#) sont envoyés par ce type d' objet.

Apprenez-en plus sur les [événements](#).

## Touches

Aucune *touche* n' est traitée par ce type d' objet.

Apprenez-en plus sur les [touches](#).

## Exemple

## C

## Image from variable and symbol



code

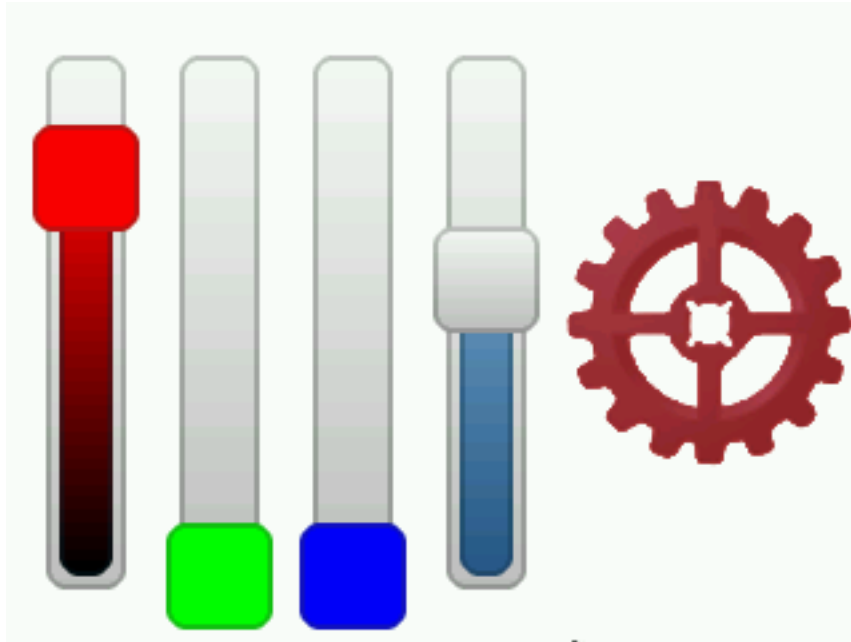
```
#include "lvgl/lvgl.h"

LV_IMG_DECLARE(cogwheel);

void lv_ex_img_1(void)
{
    lv_obj_t * img1 = lv_img_create(lv_scr_act(), NULL);
    lv_img_set_src(img1, &cogwheel);
    lv_obj_align(img1, NULL, LV_ALIGN_CENTER, 0, -20);

    lv_obj_t * img2 = lv_img_create(lv_scr_act(), NULL);
    lv_img_set_src(img2, LV_SYMBOL_OK "Accept");
    lv_obj_align(img2, img1, LV_ALIGN_OUT_BOTTOM_MID, 0, 20);
}
```

## Image recoloring



code

```
/**
 * @file lv_ex_img_2.c
 *
 */

/*****
 *   INCLUDES
 *****/

#include "lvgl/lvgl.h"

/*****
 *   DEFINES
 *****/
#define SLIDER_WIDTH 40

/*****
 *   TYPEDEFS
 *****/

/*****
 *   STATIC PROTOTYPES
 *****/
static void create_sliders(void);
static void slider_event_cb(lv_obj_t * slider, lv_event_t event);

/*****
 *   STATIC VARIABLES
 *****/
static lv_obj_t * red_slider, * green_slider, * blue_slider, * intense_slider;
static lv_obj_t * img1;
```

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```

static lv_style_t img_style;
LV_IMG_DECLARE(cogwheel);

/*****
 *   MACROS
 *****/

/*****
 *   GLOBAL FUNCTIONS
 *****/

void lv_ex_img_2(void)
{
    /*Create 4 sliders to adjust RGB color and re-color intensity*/
    create_sliders();

    /* Now create the actual image */
    img1 = lv_img_create(lv_scr_act(), NULL);
    lv_img_set_src(img1, &cogwheel);
    lv_obj_align(img1, intense_slider, LV_ALIGN_OUT_RIGHT_MID, 10, 0);

    /* Create a message box for information */
    static const char * btns[] ={"OK", ""};

    lv_obj_t * mbox = lv_mbox_create(lv_scr_act(), NULL);

    lv_mbox_set_text(mbox, "Welcome to the image recoloring demo!\nThe first three
↪sliders control the RGB value of the recoloring.\nThe last slider controls the
↪intensity.");
    lv_mbox_add_btns(mbox, btns);
    lv_obj_align(mbox, NULL, LV_ALIGN_CENTER, 0, 0);

    /* Save the image's style so the sliders can modify it */
    lv_style_copy(&img_style, lv_img_get_style(img1, LV_IMG_STYLE_MAIN));
}

/*****
 *   STATIC FUNCTIONS
 *****/

static void slider_event_cb(lv_obj_t * slider, lv_event_t event)
{
    if(event == LV_EVENT_VALUE_CHANGED) {
        /* Recolor the image based on the sliders' values */
        img_style.image.color = lv_color_make(lv_slider_get_value(red_slider), lv
↪slider_get_value(green_slider), lv_slider_get_value(blue_slider));
        img_style.image.intense = lv_slider_get_value(intense_slider);
        lv_img_set_style(img1, LV_IMG_STYLE_MAIN, &img_style);
    }
}

static void create_sliders(void)
{
    /* Create a set of RGB sliders */
    /* Use the red one as a base for all the settings */
    red_slider = lv_slider_create(lv_scr_act(), NULL);

```

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```

lv_slider_set_range(red_slider, 0, 255);
lv_obj_set_size(red_slider, SLIDER_WIDTH, 200); /* Be sure it's a vertical slider
↪*/

lv_obj_set_event_cb(red_slider, slider_event_cb);

/* Create the intensity slider first, as it does not use any custom styles */
intense_slider = lv_slider_create(lv_scr_act(), red_slider);
lv_slider_set_range(intense_slider, LV_OPA_TRANSP, LV_OPA_COVER);

/* Create the slider knob and fill styles */
/* Fill styles are initialized with a gradient between black and the slider's
↪respective color. */
/* Knob styles are simply filled with the slider's respective color. */
static lv_style_t slider_red_fill_style, slider_red_knob_style;

lv_style_copy(&slider_red_fill_style, lv_slider_get_style(red_slider, LV_SLIDER_
↪STYLE_INDIC));
lv_style_copy(&slider_red_knob_style, lv_slider_get_style(red_slider, LV_SLIDER_
↪STYLE_KNOB));

slider_red_fill_style.body.main_color = lv_color_make(255, 0, 0);
slider_red_fill_style.body.grad_color = LV_COLOR_BLACK;

slider_red_knob_style.body.main_color = slider_red_knob_style.body.grad_color =
↪slider_red_fill_style.body.main_color;

static lv_style_t slider_green_fill_style, slider_green_knob_style;
lv_style_copy(&slider_green_fill_style, &slider_red_fill_style);
lv_style_copy(&slider_green_knob_style, &slider_red_knob_style);

slider_green_fill_style.body.main_color = lv_color_make(0, 255, 0);

slider_green_knob_style.body.main_color = slider_green_knob_style.body.grad_color
↪= slider_green_fill_style.body.main_color;

static lv_style_t slider_blue_fill_style, slider_blue_knob_style;
lv_style_copy(&slider_blue_fill_style, &slider_red_fill_style);
lv_style_copy(&slider_blue_knob_style, &slider_red_knob_style);

slider_blue_fill_style.body.main_color = lv_color_make(0, 0, 255);

slider_blue_knob_style.body.main_color = slider_blue_knob_style.body.grad_color =
↪slider_blue_fill_style.body.main_color;

/* Setup the red slider */
lv_slider_set_style(red_slider, LV_SLIDER_STYLE_INDIC, &slider_red_fill_style);
lv_slider_set_style(red_slider, LV_SLIDER_STYLE_KNOB, &slider_red_knob_style);

/* Copy it for the other two sliders */
green_slider = lv_slider_create(lv_scr_act(), red_slider);
lv_slider_set_style(green_slider, LV_SLIDER_STYLE_INDIC, &slider_green_fill_
↪style);
lv_slider_set_style(green_slider, LV_SLIDER_STYLE_KNOB, &slider_green_knob_style);

blue_slider = lv_slider_create(lv_scr_act(), red_slider);

```

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```
lv_slider_set_style(blue_slider, LV_SLIDER_STYLE_INDIC, &slider_blue_fill_style);
lv_slider_set_style(blue_slider, LV_SLIDER_STYLE_KNOB, &slider_blue_knob_style);

lv_obj_align(red_slider, NULL, LV_ALIGN_IN_LEFT_MID, 10, 0);

lv_obj_align(green_slider, red_slider, LV_ALIGN_OUT_RIGHT_MID, 10, 0);

lv_obj_align(blue_slider, green_slider, LV_ALIGN_OUT_RIGHT_MID, 10, 0);

lv_obj_align(intense_slider, blue_slider, LV_ALIGN_OUT_RIGHT_MID, 10, 0);
}
```

## MicroPython

### Image from PNG file



✓ Accept

code

```
from imagetools import get_png_info, open_png

# Register PNG image decoder
decoder = lv.img.decoder_create()
decoder.info_cb = get_png_info
decoder.open_cb = open_png

# Create a screen with a draggable image

with open('cogwheel.png', 'rb') as f:
    png_data = f.read()

png_img_dsc = lv.img_dsc_t({
```

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```
'data_size': len(png_data),
'data': png_data
})

scr = lv.scr_act()

# Create an image on the left using the decoder

# lv.img.cache_set_size(2)
img1 = lv.img(scr)
img1.align(scr, lv.ALIGN.CENTER, 0, -20)
img1.set_src(png_img_dsc)

img2 = lv.img(scr)
img2.set_src(lv.SYMBOL.OK + "Accept")
img2.align(img1, lv.ALIGN.OUT_BOTTOM_MID, 0, 20)
```

## API

### Typedefs

**typedef** uint8\_t **lv\_img\_style\_t**

### Enums

**enum** [anonymous]

*Values:*

**LV\_IMG\_STYLE\_MAIN**

### Functions

*lv\_obj\_t* \***lv\_img\_create**(*lv\_obj\_t* \*par, **const** *lv\_obj\_t* \*copy)

Create an image objects

**Return** pointer to the created image

#### Parameters

- **par**: pointer to an object, it will be the parent of the new button
- **copy**: pointer to a image object, if not NULL then the new object will be copied from it

**void** **lv\_img\_set\_src**(*lv\_obj\_t* \*img, **const** void \*src\_img)

Set the pixel map to display by the image

#### Parameters

- **img**: pointer to an image object
- **data**: the image data

**void** **lv\_img\_set\_auto\_size**(*lv\_obj\_t* \*img, bool autosize\_en)

Enable the auto size feature. If enabled the object size will be same as the picture size.

#### Parameters

- **img**: pointer to an image
- **en**: true: auto size enable, false: auto size disable

void **lv\_img\_set\_offset\_x**(*lv\_obj\_t \*img*, lv\_coord\_t *x*)

Set an offset for the source of an image. so the image will be displayed from the new origin.

#### Parameters

- **img**: pointer to an image
- **x**: the new offset along x axis.

void **lv\_img\_set\_offset\_y**(*lv\_obj\_t \*img*, lv\_coord\_t *y*)

Set an offset for the source of an image. so the image will be displayed from the new origin.

#### Parameters

- **img**: pointer to an image
- **y**: the new offset along y axis.

static void **lv\_img\_set\_style**(*lv\_obj\_t \*img*, *lv\_img\_style\_t type*, const lv\_style\_t \**style*)

Set the style of an image

#### Parameters

- **img**: pointer to an image object
- **type**: which style should be set (can be only LV\_IMG\_STYLE\_MAIN)
- **style**: pointer to a style

const void \***lv\_img\_get\_src**(*lv\_obj\_t \*img*)

Get the source of the image

**Return** the image source (symbol, file name or C array)

#### Parameters

- **img**: pointer to an image object

const char \***lv\_img\_get\_file\_name**(const *lv\_obj\_t \*img*)

Get the name of the file set for an image

**Return** file name

#### Parameters

- **img**: pointer to an image

bool **lv\_img\_get\_auto\_size**(const *lv\_obj\_t \*img*)

Get the auto size enable attribute

**Return** true: auto size is enabled, false: auto size is disabled

#### Parameters

- **img**: pointer to an image

lv\_coord\_t **lv\_img\_get\_offset\_x**(*lv\_obj\_t \*img*)

Get the offset.x attribute of the img object.

**Return** offset.x value.

#### Parameters

- **img**: pointer to an image

```
lv_coord_t lv_img_get_offset_y(lv_obj_t *img)
```

Get the offset.y attribute of the img object.

**Return** offset.y value.

**Parameters**

- **img**: pointer to an image

```
static const lv_style_t *lv_img_get_style(const lv_obj_t *img, lv_img_style_t type)
```

Get the style of an image object

**Return** pointer to the image's style

**Parameters**

- **img**: pointer to an image object
- **type**: which style should be get (can be only LV\_IMG\_STYLE\_MAIN)

```
struct lv_img_ext_t
```

**Public Members**

```
const void *src
```

```
lv_point_t offset
```

```
lv_coord_t w
```

```
lv_coord_t h
```

```
uint8_t src_type
```

```
uint8_t auto_size
```

```
uint8_t cf
```

**Bouton image (lv\_imgbtn)**

**Vue d'ensemble**

The Image button is very similar to the simple 'Button' object. The only difference is that, it displays user-defined images in each state instead of drawing a button. Before reading this section, please read the *Button* section for better understanding.

**Images sources**

To set the image in a state, use the `lv_imgbtn_set_src(imgbtn, LV_BTN_STATE_..., &img_src)`. The image sources works the same as described in the *Image object* except that, "Symbols" are not supported by the Image button.

If `LV_IMGBTN_TILED` is enabled in `lv_conf.h`, then three sources can be set for each state:

- gauche,
- centre,
- droit.

The *center* image will be repeated to fill the width of the object. Therefore with `LV_IMGBTN_TILED`, you can set the width of the Image button. However, without this option, the width will be always the same as the image source's width.

## Etats

The states also work like with Button object. It can be set with `lv_imgbtn_set_state(imgbtn, LV_BTN_STATE_...)`.

## Bascule

La fonctionnalité bascule peut être activée avec `lv_imgbtn_set_toggle(imgbtn, true)`.

## Styles

Similar to normal Buttons, Image buttons also have 5 independent styles for the 5 state. You can set them via: `lv_imgbtn_set_style(btn, LV_IMGBTN_STYLE_..., &style)`. The styles use the `style.image` properties.

- `LV_IMGBTN_STYLE_REL` - Style of the released state. Default: `lv_style_btn_rel`.
- `LV_IMGBTN_STYLE_PR` - Style of the pressed state. Default: `lv_style_btn_pr`.
- `LV_IMGBTN_STYLE_TGL_REL` - Style of the toggled released state. Default: `lv_style_btn_tgl_rel`.
- `LV_IMGBTN_STYLE_TGL_PR` - Style of the toggled pressed state. Default: `lv_style_btn_tgl_pr`.
- `LV_IMGBTN_STYLE_INA` - Style of the inactive state. Default: `lv_style_btn_ina`.

When labels are created on a button, it's a good practice to set the image button's `style.text` properties too. Because labels have `style = NULL`, by default, they inherit the parent's (image button) style. Hence you don't need to create a new style for the label.

## Événements

Beside the [Generic events](#), the following [Special events](#) are sent by the buttons:

- `LV_EVENT_VALUE_CHANGED` - Sent when the button is toggled.

Note that, the generic input device related events (like `LV_EVENT_PRESSED`) are sent in the inactive state too. You need to check the state with `lv_btn_get_state(btn)` to ignore the events from inactive buttons.

Apprenez-en plus sur les [événements](#).

## Touches

Les *touches* suivantes sont traitées par les cases à cocher:

- `LV_KEY_RIGHT/UP` - Go to toggled state if toggling is enabled.
- `LV_KEY_LEFT/DOWN` - Go to non-toggled state if toggling is enabled.

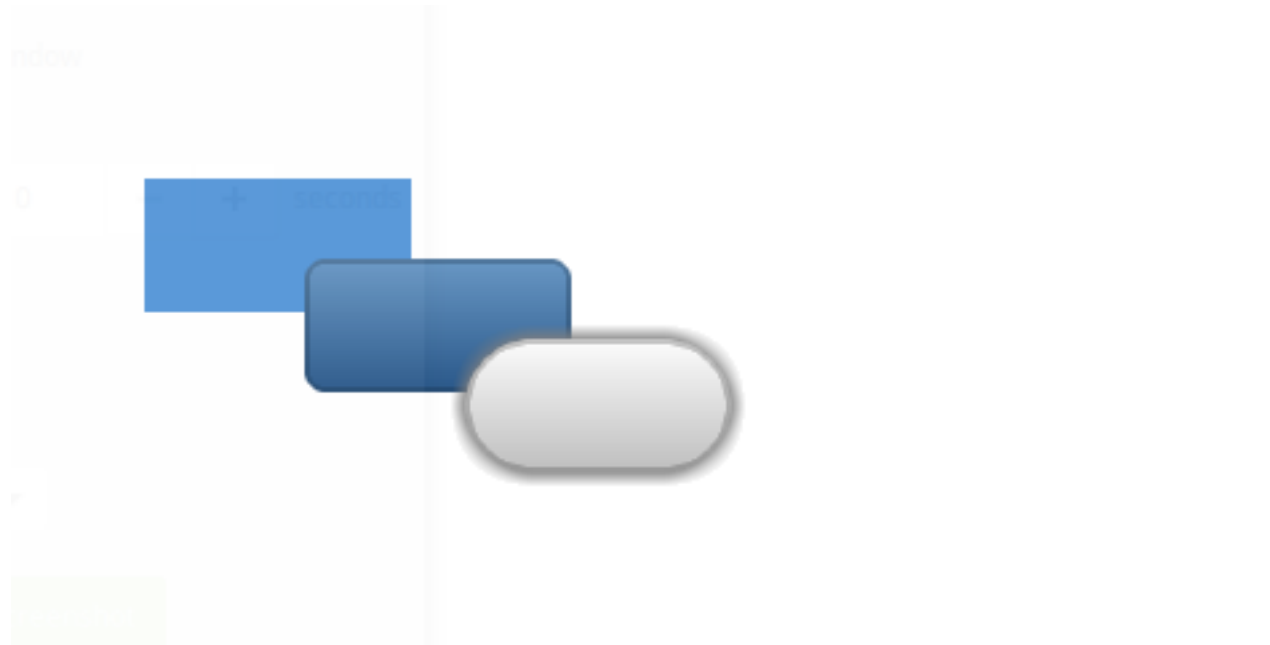
Notez que, comme d'habitude, l'état de `LV_KEY_ENTER` est traduit en `LV_EVENT_PRESSED/PRESSING/RELEASED` etc.

Apprenez-en plus sur les *touches*.

## Exemple

### C

#### Base objects with custom styles



code

```
#include "lvgl/lvgl.h"

void lv_ex_obj_1(void)
{
    lv_obj_t * obj1;
    obj1 = lv_obj_create(lv_scr_act(), NULL);
    lv_obj_set_size(obj1, 100, 50);
    lv_obj_set_style(obj1, &lv_style_plain_color);
    lv_obj_align(obj1, NULL, LV_ALIGN_CENTER, -60, -30);

    /*Copy the previous object and enable drag*/
    lv_obj_t * obj2;
    obj2 = lv_obj_create(lv_scr_act(), obj1);
    lv_obj_set_style(obj2, &lv_style_pretty_color);
    lv_obj_align(obj2, NULL, LV_ALIGN_CENTER, 0, 0);
    lv_obj_set_drag(obj2, true);

    static lv_style_t style_shadow;
    lv_style_copy(&style_shadow, &lv_style_pretty);
    style_shadow.body.shadow.width = 6;
}
```

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```

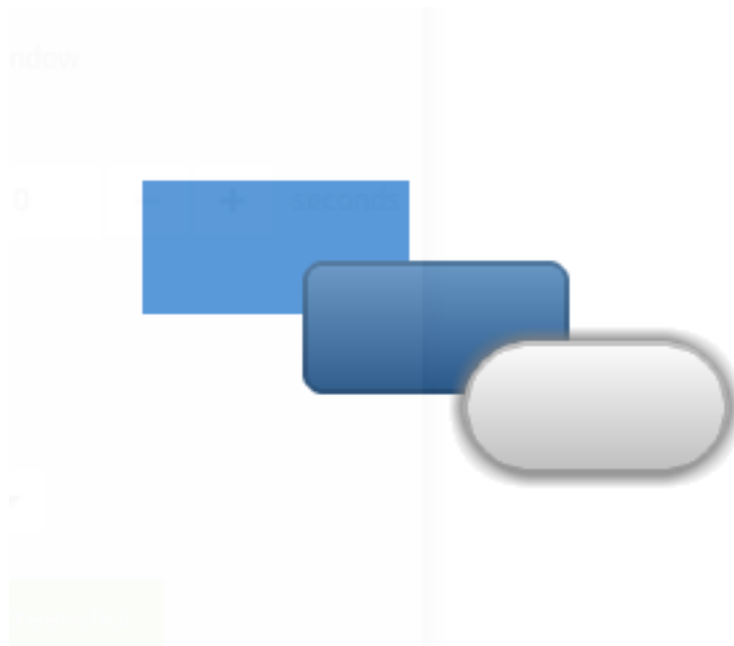
style_shadow.body.radius = LV_RADIUS_CIRCLE;

/*Copy the previous object (drag is already enabled)*/
lv_obj_t * obj3;
obj3 = lv_obj_create(lv_scr_act(), obj2);
lv_obj_set_style(obj3, &style_shadow);
lv_obj_align(obj3, NULL, LV_ALIGN_CENTER, 60, 30);
}

```

## MicroPython

### Base objects with custom styles



code

```

obj1 = lv.obj(lv.scr_act())
obj1.set_size(100, 50)
obj1.set_style(lv.style_plain_color)
obj1.align(None, lv.ALIGN.CENTER, -60, -30)

# Copy the previous object and enable drag
obj2 = lv.obj(lv.scr_act(), obj1)
obj2.set_style(lv.style_pretty_color)
obj2.align(None, lv.ALIGN.CENTER, 0, 0)
obj2.set_drag(True)

style_shadow = lv.style_t()
lv.style_copy(style_shadow, lv.style_pretty)
style_shadow.body.shadow.width = 6
style_shadow.body.radius = 800 # large enough to make it round

```

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```
# Copy the previous object (drag is already enabled)
obj3 = lv.obj(lv.scr_act(), obj2)
obj3.set_style(style_shadow)
obj3.align(None, lv.ALIGN.CENTER, 60, 30)
```

## API

### Typedefs

**typedef** uint8\_t **lv\_imgbtn\_style\_t**

### Enums

**enum** [anonymous]

*Values:*

**LV\_IMGBTN\_STYLE\_REL**

Same meaning as ordinary button styles.

**LV\_IMGBTN\_STYLE\_PR**

**LV\_IMGBTN\_STYLE\_TGL\_REL**

**LV\_IMGBTN\_STYLE\_TGL\_PR**

**LV\_IMGBTN\_STYLE\_INA**

### Functions

*lv\_obj\_t* \***lv\_imgbtn\_create**(*lv\_obj\_t* \*par, **const** *lv\_obj\_t* \*copy)

Create a image button objects

**Return** pointer to the created image button

#### Parameters

- **par**: pointer to an object, it will be the parent of the new image button
- **copy**: pointer to a image button object, if not NULL then the new object will be copied from it

**void** **lv\_imgbtn\_set\_src**(*lv\_obj\_t* \*imgbtn, *lv\_btn\_state\_t* state, **const** void \*src)

Set images for a state of the image button

#### Parameters

- **imgbtn**: pointer to an image button object
- **state**: for which state set the new image (from **lv\_btn\_state\_t**) ‘
- **src**: pointer to an image source (a C array or path to a file)

**void** **lv\_imgbtn\_set\_src**(*lv\_obj\_t* \*imgbtn, *lv\_btn\_state\_t* state, **const** void \*src\_left, **const** void \*src\_mid, **const** void \*src\_right)

Set images for a state of the image button

#### Parameters

- **imgbtn**: pointer to an image button object

- **state**: for which state set the new image (from `lv_btn_state_t`) ‘
- **src\_left**: pointer to an image source for the left side of the button (a C array or path to a file)
- **src\_mid**: pointer to an image source for the middle of the button (ideally 1px wide) (a C array or path to a file)
- **src\_right**: pointer to an image source for the right side of the button (a C array or path to a file)

**static** void **lv\_imgbtn\_set\_toggle**(*lv\_obj\_t* \*imgbtn, bool tgl)

Enable the toggled states. On release the button will change from/to toggled state.

**Parameters**

- **imgbtn**: pointer to an image button object
- **tgl**: true: enable toggled states, false: disable

**static** void **lv\_imgbtn\_set\_state**(*lv\_obj\_t* \*imgbtn, *lv\_btn\_state\_t* state)

Set the state of the image button

**Parameters**

- **imgbtn**: pointer to an image button object
- **state**: the new state of the button (from `lv_btn_state_t` enum)

**static** void **lv\_imgbtn\_toggle**(*lv\_obj\_t* \*imgbtn)

Toggle the state of the image button (ON->OFF, OFF->ON)

**Parameters**

- **imgbtn**: pointer to a image button object

void **lv\_imgbtn\_set\_style**(*lv\_obj\_t* \*imgbtn, *lv\_imgbtn\_style\_t* type, **const** *lv\_style\_t* \*style)

Set a style of a image button.

**Parameters**

- **imgbtn**: pointer to image button object
- **type**: which style should be set
- **style**: pointer to a style

**const** void \***lv\_imgbtn\_get\_src**(*lv\_obj\_t* \*imgbtn, *lv\_btn\_state\_t* state)

Get the images in a given state

**Return** pointer to an image source (a C array or path to a file)

**Parameters**

- **imgbtn**: pointer to an image button object
- **state**: the state where to get the image (from `lv_btn_state_t`) ‘

**const** void \***lv\_imgbtn\_get\_src\_left**(*lv\_obj\_t* \*imgbtn, *lv\_btn\_state\_t* state)

Get the left image in a given state

**Return** pointer to the left image source (a C array or path to a file)

**Parameters**

- **imgbtn**: pointer to an image button object
- **state**: the state where to get the image (from `lv_btn_state_t`) ‘

**const** void \***lv\_imgbtn\_get\_src\_middle**(*lv\_obj\_t* \*imgbtn, *lv\_btn\_state\_t* state)

Get the middle image in a given state

**Return** pointer to the middle image source (a C array or path to a file)

**Parameters**

- **imgbtn**: pointer to an image button object
- **state**: the state where to get the image (from *lv\_btn\_state\_t*) ‘

**const** void \***lv\_imgbtn\_get\_src\_right**(*lv\_obj\_t* \*imgbtn, *lv\_btn\_state\_t* state)

Get the right image in a given state

**Return** pointer to the left image source (a C array or path to a file)

**Parameters**

- **imgbtn**: pointer to an image button object
- **state**: the state where to get the image (from *lv\_btn\_state\_t*) ‘

**static** *lv\_btn\_state\_t* **lv\_imgbtn\_get\_state**(**const** *lv\_obj\_t* \*imgbtn)

Get the current state of the image button

**Return** the state of the button (from *lv\_btn\_state\_t* enum)

**Parameters**

- **imgbtn**: pointer to a image button object

**static** bool **lv\_imgbtn\_get\_toggle**(**const** *lv\_obj\_t* \*imgbtn)

Get the toggle enable attribute of the image button

**Return** ture: toggle enabled, false: disabled

**Parameters**

- **imgbtn**: pointer to a image button object

**const** *lv\_style\_t* \***lv\_imgbtn\_get\_style**(**const** *lv\_obj\_t* \*imgbtn, *lv\_imgbtn\_style\_t* type)

Get style of a image button.

**Return** style pointer to the style

**Parameters**

- **imgbtn**: pointer to image button object
- **type**: which style should be get

**struct** **lv\_imgbtn\_ext\_t**

**Public Members**

*lv\_btn\_ext\_t* **btn**

**const** void \***img\_src**[\_LV\_BTN\_STATE\_NUM]

**const** void \***img\_src\_left**[\_LV\_BTN\_STATE\_NUM]

**const** void \***img\_src\_mid**[\_LV\_BTN\_STATE\_NUM]

**const** void \***img\_src\_right**[\_LV\_BTN\_STATE\_NUM]

*lv\_img\_cf\_t* **act\_cf**

## Clavier (lv\_kb)

### Vue d' ensemble

The Keyboard object is a special *Button matrix* with predefined keymaps and other features to realize a virtual keyboard to write text.

### Modes

Les claviers ont deux modes :

- **LV\_KB\_MODE\_TEXT** - Display letters, number, and special characters.
- **LV\_KB\_MODE\_NUM** - Display numbers, +/- sign, and decimal dot.

To set the mode, use `lv_kb_set_mode(kb, mode)`. The default is *LV\_KB\_MODE\_TEXT*.

### Zone de texte

You can assign a *Text area* to the Keyboard to automatically put the clicked characters there. To assign the text area, use `lv_kb_set_ta(kb, ta)`.

The assigned text area's **cursor can be managed** by the keyboard: when the keyboard is assigned, the previous text area's cursor will be hidden and the new one will be shown. When the keyboard is closed by the *Ok* or *Close* buttons, the cursor also will be hidden. The cursor manager feature is enabled by `lv_kb_set_cursor_manage(kb, true)`. The default is not managed.

### New Keymap

You can specify a new map (layout) for the keyboard with `lv_kb_set_map(kb, map)` and `lv_kb_set_ctrl_map(kb, ctrl_map)`. Learn more about the *Button matrix* object. Keep in mind that, using following keywords will have the same effect as with the original map:

- *LV\_SYMBOL\_OK* - Apply.
- *SYMBOL\_CLOSE* - Close.
- *LV\_SYMBOL\_LEFT* - Move the cursor left.
- *LV\_SYMBOL\_RIGHT* - Move the cursor right.
- “*ABC*” - Load the uppercase map.
- “*abc*” - Load the lower case map.
- “*Enter*” - New line.
- “*Bkps*” - Delete on the left.

### Styles

The Keyboard work with 6 styles: a background and 5 button styles for each state. You can set the styles with `lv_kb_set_style(btn, LV_KB_STYLE_..., &style)`. The background and the buttons use the `style.body` properties. Les étiquettes utilisent les propriétés `style.text` des styles de boutons.

- **LV\_KB\_STYLE\_BG** - Background style. Uses all `style.body` properties including `padding`. Default: `lv_style_pretty`.
- **LV\_KB\_STYLE\_BTN\_REL** - Style of the released buttons. Default: `lv_style_btn_rel`.
- **LV\_KB\_STYLE\_BTN\_PR** - Style of the pressed buttons. Default: `lv_style_btn_pr`.
- **LV\_KB\_STYLE\_BTN\_TGL\_REL** - Style of the toggled released buttons. Default: `lv_style_btn_tgl_rel`.
- **LV\_KB\_STYLE\_BTN\_TGL\_PR** - Style of the toggled pressed buttons. Default: `lv_style_btn_tgl_pr`.
- **LV\_KB\_STYLE\_BTN\_INA** - Style of the inactive buttons. Default: `lv_style_btn_ina`.

## Événements

Besides the [Generic events](#), the following [Special events](#) are sent by the keyboards:

- **LV\_EVENT\_VALUE\_CHANGED** - Sent when the button is pressed/released or repeated after long press. The event data is set to the ID of the pressed/released button.
- **LV\_EVENT\_APPLY** - The *Ok* button is clicked.
- **LV\_EVENT\_CANCEL** - The *Close* button is clicked.

The keyboard has a **default event handler** callback called `lv_kb_def_event_cb`. It handles the button pressing, map changing, the assigned text area, etc. You can completely replace it with your custom event handler however, you can call `lv_kb_def_event_cb` at the beginning of your event handler to handle the same things as before.

Apprenez-en plus sur les [événements](#).

## Touches

The following *Keys* are processed by the buttons:

- **LV\_KEY\_RIGHT/UP/LEFT/RIGHT** - To navigate among the buttons and select one.
- **LV\_KEY\_ENTER** - To press/release the selected button.

Apprenez-en plus sur les [touches](#).

## Exemples

### C

## Keyboard with text area



code

```
#include "lvgl/lvgl.h"

void lv_ex_kb_1(void)
{
    /*Create styles for the keyboard*/
    static lv_style_t rel_style, pr_style;

    lv_style_copy(&rel_style, &lv_style_btn_rel);
    rel_style.body.radius = 0;
    rel_style.body.border.width = 1;

    lv_style_copy(&pr_style, &lv_style_btn_pr);
    pr_style.body.radius = 0;
    pr_style.body.border.width = 1;

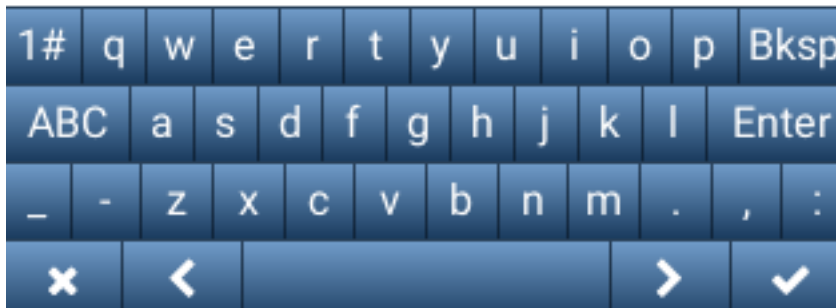
    /*Create a keyboard and apply the styles*/
    lv_obj_t *kb = lv_kb_create(lv_scr_act(), NULL);
    lv_kb_set_cursor_manage(kb, true);
    lv_kb_set_style(kb, LV_KB_STYLE_BG, &lv_style_transp_tight);
    lv_kb_set_style(kb, LV_KB_STYLE_BTN_REL, &rel_style);
    lv_kb_set_style(kb, LV_KB_STYLE_BTN_PR, &pr_style);

    /*Create a text area. The keyboard will write here*/
    lv_obj_t *ta = lv_ta_create(lv_scr_act(), NULL);
    lv_obj_align(ta, NULL, LV_ALIGN_IN_TOP_MID, 0, 10);
    lv_ta_set_text(ta, "");

    /*Assign the text area to the keyboard*/
    lv_kb_set_ta(kb, ta);
}
```

## MicroPython

### Keyboard with text area



code

```
# Create styles for the keyboard
rel_style = lv.style_t()
pr_style = lv.style_t()

lv.style_copy(rel_style, lv.style_btn_rel)
rel_style.body.radius = 0
rel_style.body.border.width = 1

lv.style_copy(pr_style, lv.style_btn_pr)
pr_style.body.radius = 0
pr_style.body.border.width = 1

# Create a keyboard and apply the styles
kb = lv.kb(lv.scr_act())
kb.set_cursor_manage(True)
kb.set_style(lv.kb.STYLE.BG, lv.style_transp_tight)
kb.set_style(lv.kb.STYLE.BTN_REL, rel_style)
kb.set_style(lv.kb.STYLE.BTN_PR, pr_style)

# Create a text area. The keyboard will write here
ta = lv.ta(lv.scr_act())
ta.align(None, lv.ALIGN.IN_TOP_MID, 0, 10)
ta.set_text("")

# Assign the text area to the keyboard
kb.set_ta(ta)
```

## API

### Typedefs

```
typedef uint8_t lv_kb_mode_t
typedef uint8_t lv_kb_style_t
```

### Enums

```
enum [anonymous]
    Current keyboard mode.
    Values:
    LV_KB_MODE_TEXT
    LV_KB_MODE_NUM
    LV_KB_MODE_TEXT_UPPER
enum [anonymous]
    Values:
    LV_KB_STYLE_BG
    LV_KB_STYLE_BTN_REL
    LV_KB_STYLE_BTN_PR
    LV_KB_STYLE_BTN_TGL_REL
    LV_KB_STYLE_BTN_TGL_PR
    LV_KB_STYLE_BTN_INA
```

### Functions

```
lv_obj_t *lv_kb_create(lv_obj_t *par, const lv_obj_t *copy)
```

Create a keyboard objects

**Return** pointer to the created keyboard

#### Parameters

- **par**: pointer to an object, it will be the parent of the new keyboard
- **copy**: pointer to a keyboard object, if not NULL then the new object will be copied from it

```
void lv_kb_set_ta(lv_obj_t *kb, lv_obj_t *ta)
```

Assign a Text Area to the Keyboard. The pressed characters will be put there.

#### Parameters

- **kb**: pointer to a Keyboard object
- **ta**: pointer to a Text Area object to write there

```
void lv_kb_set_mode(lv_obj_t *kb, lv_kb_mode_t mode)
```

Set a new a mode (text or number map)

#### Parameters

- **kb**: pointer to a Keyboard object



- **mode**: the mode from `'lv_kb_mode_t'`

void **lv\_kb\_set\_cursor\_manage**(*lv\_obj\_t* \**kb*, bool *en*)

Automatically hide or show the cursor of the current Text Area

#### Parameters

- **kb**: pointer to a Keyboard object
- **en**: true: show cursor on the current text area, false: hide cursor

**static** void **lv\_kb\_set\_map**(*lv\_obj\_t* \**kb*, const char \**map*[])

Set a new map for the keyboard

#### Parameters

- **kb**: pointer to a Keyboard object
- **map**: pointer to a string array to describe the map. See `'lv_btm_set_map()'` for more info.

**static** void **lv\_kb\_set\_ctrl\_map**(*lv\_obj\_t* \**kb*, const *lv\_btm\_ctrl\_t* *ctrl\_map*[])

Set the button control map (hidden, disabled etc.) for the keyboard. The control map array will be copied and so may be deallocated after this function returns.

#### Parameters

- **kb**: pointer to a keyboard object
- **ctrl\_map**: pointer to an array of *lv\_btm\_ctrl\_t* control bytes. See: `lv_btm_set_ctrl_map` for more details.

void **lv\_kb\_set\_style**(*lv\_obj\_t* \**kb*, *lv\_kb\_style\_t* *type*, const *lv\_style\_t* \**style*)

Set a style of a keyboard

#### Parameters

- **kb**: pointer to a keyboard object
- **type**: which style should be set
- **style**: pointer to a style

*lv\_obj\_t* \***lv\_kb\_get\_ta**(const *lv\_obj\_t* \**kb*)

Assign a Text Area to the Keyboard. The pressed characters will be put there.

**Return** pointer to the assigned Text Area object

#### Parameters

- **kb**: pointer to a Keyboard object

*lv\_kb\_mode\_t* **lv\_kb\_get\_mode**(const *lv\_obj\_t* \**kb*)

Set a new a mode (text or number map)

**Return** the current mode from `'lv_kb_mode_t'`

#### Parameters

- **kb**: pointer to a Keyboard object

bool **lv\_kb\_get\_cursor\_manage**(const *lv\_obj\_t* \**kb*)

Get the current cursor manage mode.

**Return** true: show cursor on the current text area, false: hide cursor

#### Parameters

- **kb**: pointer to a Keyboard object

**static const** char \*\***lv\_kb\_get\_map\_array**(const *lv\_obj\_t* \*kb)

Get the current map of a keyboard

**Return** the current map

**Parameters**

- **kb**: pointer to a keyboard object

**const** *lv\_style\_t* \***lv\_kb\_get\_style**(const *lv\_obj\_t* \*kb, *lv\_kb\_style\_t* type)

Get a style of a keyboard

**Return** style pointer to a style

**Parameters**

- **kb**: pointer to a keyboard object
- **type**: which style should be get

void **lv\_kb\_def\_event\_cb**(*lv\_obj\_t* \*kb, *lv\_event\_t* event)

Default keyboard event to add characters to the Text area and change the map. If a custom **event\_cb** is added to the keyboard this function be called from it to handle the button clicks

**Parameters**

- **kb**: pointer to a keyboard
- **event**: the triggering event

**struct** **lv\_kb\_ext\_t**

**Public Members**

*lv\_btnm\_ext\_t* **btnm**

*lv\_obj\_t* \***ta**

*lv\_kb\_mode\_t* **mode**

uint8\_t **cursor\_mng**

**Etiquette (lv\_label)**

**Vue d' ensemble**

A label is the basic object type that is used to display text.

**Définir le texte**

You can set the text on a label at runtime with **lv\_label\_set\_text**(label, "New text"). It will allocate a buffer dynamically, and the provided string will be copied into that buffer. Therefore, you don't need to keep the text you pass to **lv\_label\_set\_text** in scope after that function returns.

With **lv\_label\_set\_text\_fmt**(label, "Value: %d", 15) **printf formatting** can be used to set the text.

Labels are able to show text from a **static character buffer** which is NUL-terminated. To do so, use `lv_label_set_static_text(label, char_array)`. In this case, the text is not stored in the dynamic memory and the given buffer is used directly instead. This means that the array can't be a local variable which goes out of scope when the function exits. Constant strings are safe to use with `lv_label_set_static_text` (except when used with `LV_LABEL_LONG_DOTS`, as it modifies the buffer in-place), as they are stored in RO memory, which is always accessible.

You can also use a **raw array** as label text. The array doesn't have to be `\0` terminated. In this case, the text will be saved to the dynamic memory like with `lv_label_set_text`. To set a raw character array, use the `lv_label_set_array_text(label, char_array, size)` function.

## Saut de ligne

Line breaks are handled automatically by the label object. You can use `\n` to make a line break. For example: `"line1\nline2\n\nline4"`

## Modes d'adaptation au texte

By default, the width of the label object automatically expands to the text size. Otherwise, the text can be manipulated according to several long mode policies:

- **LV\_LABEL\_LONG\_EXPAND** - Expand the object size to the text size (Default)
- **LV\_LABEL\_LONG\_BREAK** - Keep the object width, break (wrap) the too long lines and expand the object height
- **LV\_LABEL\_LONG\_DOTS** - Keep the object size, break the text and write dots in the last line (not supported when using `lv_label_set_static_text`)
- **LV\_LABEL\_LONG\_SCROLL** - Keep the size and scroll the label back and forth
- **LV\_LABEL\_LONG\_SCROLL\_CIRC** - Keep the size and scroll the label circularly
- **LV\_LABEL\_LONG\_CROP** - Keep the size and crop the text out of it

You can specify the long mode with `lv_label_set_long_mode(label, LV_LABEL_LONG_...)`

It's important to note that, when a label is created and its text is set, the label's size already expanded to the text size. In addition with the default `LV_LABEL_LONG_EXPAND`, *long mode* `lv_obj_set_width/height/size()` has no effect. So you need to change the *long mode* first and then set the size with `lv_obj_set_width/height/size()`.

Another important note is that **LV\_LABEL\_LONG\_DOTS** manipulates the text buffer **in-place** in order to add/remove the dots. When `lv_label_set_text` or `lv_label_set_array_text` are used, a separate buffer is allocated and this implementation detail is unnoticed. This is not the case with `lv_label_set_static_text`! The buffer you pass to `lv_label_set_static_text` must be writable if you plan to use **LV\_LABEL\_LONG\_DOTS**.

## Alignement du texte

The label's text can be aligned to the left, right or middle with `lv_label_set_align(label, LV_LABEL_ALIGN_LEFT/RIGHT/CENTER)`.

Vertical alignment is not supported by the label itself; you should place the label inside a larger container and align the whole label object instead.

## Dessin d' arrière-plan

Vous pouvez activer le dessin de l' arrière-plan de l' étiquette avec `lv_label_set_body_draw(label, draw)`

L' arrière-plan sera plus grand dans toutes les directions de la valeur de `body.padding.top/bottom/left/right`. However, the background is drawn only “virtually” and doesn' t make the label' s logical coordinates any larger. Therefore when the label is positioned, the label' s coordinates will be taken into account and not background' s.

## Coloration du texte

In the text, you can use commands to recolor parts of the text. For example: "Write a `#ff0000` red# word". Cette fonctionnalité peut être activée individuellement pour chaque étiquette à l' aide de la fonction `lv_label_set_recolor()`.

Note that, recoloring work only in a single line. Therefore, `\n` should not use in a recolored text or it should be wrapped by `LV_LABEL_LONG_BREAK` else, the text in the new line won' t be recolored.

## Très long textes

LittlevGL can efficiently handle very long (> 40k characters) by saving some extra data (~12 bytes) to speed up drawing. To enable this feature, set `LV_LABEL_LONG_TXT_HINT 1` in *lv\_conf.h*.

## Symboles

The labels can display symbols alongside letters (or on their own). Read the [Font](#) section to learn more about the symbols.

## Styles

The Label uses one style which can be set by `lv_label_set_style(label, LV_LABEL_STYLE_MAIN, &style)`. From the style the following properties are used:

- All properties from `style.text`
- For background drawing `style.body` properties. `padding` will increase the size only visually, the real object' s size won' t be changed.

The labels' default style is `NULL` so they inherit the parent' s style. It' s useful because it allows the parent to set an appropriate text style for any child labels.

## Événements

Seuls les événements génériques sont envoyés par ce type d' objet.

Apprenez-en plus sur les [événements](#).

## Touches

Aucune *touche* n' est traitée par ce type d' objet.

Apprenez-en plus sur les *touches*.

## Exemple

### C

#### Label recoloring and scrolling

Re-color words of a  
label and wrap long  
text automatically.

It is a circularly scr

code

```
#include "lvgl/lvgl.h"

void lv_ex_label_1(void)
{
    lv_obj_t * label1 = lv_label_create(lv_scr_act(), NULL);
    lv_label_set_long_mode(label1, LV_LABEL_LONG_BREAK); /*Break the long lines*/
    lv_label_set_recolor(label1, true); /*Enable re-coloring by_
↪ commands in the text*/
    lv_label_set_align(label1, LV_LABEL_ALIGN_CENTER); /*Center aligned lines*/
    lv_label_set_text(label1, "#000080 Re-color# #0000ff words# #6666ff of a# label "
        "and wrap long text automatically.");
    lv_obj_set_width(label1, 150);
    lv_obj_align(label1, NULL, LV_ALIGN_CENTER, 0, -30);

    lv_obj_t * label2 = lv_label_create(lv_scr_act(), NULL);
    lv_label_set_long_mode(label2, LV_LABEL_LONG_SCROLL_CIRC); /*Circular scroll*/
    lv_obj_set_width(label2, 150);
    lv_label_set_text(label2, "It is a circularly scrolling text. ");
    lv_obj_align(label2, NULL, LV_ALIGN_CENTER, 0, 30);
}
```

## Text shadow

A simple method to create  
shadows on text  
It even works with  
  
newlines    and spaces.

code

```
#include "lvgl/lvgl.h"

void lv_ex_label_2(void)
{
    /* Create a style for the shadow*/
    static lv_style_t label_style;
    lv_style_copy(&label_style, &lv_style_plain);
    label_style.text.opa = LV_OPA_50;

    /*Create a label for the shadow first (it's in the background) */
    lv_obj_t * shadow_label = lv_label_create(lv_scr_act(), NULL);
    lv_label_set_style(shadow_label, LV_LABEL_STYLE_MAIN, &label_style);

    /* Create the main label */
    lv_obj_t * main_label = lv_label_create(lv_scr_act(), NULL);
    lv_label_set_text(main_label, "A simple method to create\n"
                                   "shadows on text\n"
                                   "It even works with\n\n"
                                   "newlines        and spaces.");

    /*Set the same text for the shadow label*/
    lv_label_set_text(shadow_label, lv_label_get_text(main_label));

    /* Position the main label */
    lv_obj_align(main_label, NULL, LV_ALIGN_CENTER, 0, 0);

    /* Shift the second label down and to the right by 1 pixel */
    lv_obj_align(shadow_label, main_label, LV_ALIGN_IN_TOP_LEFT, 1, 1);
}
```

## Align labels

A text with  
multiple  
lines

A text with  
multiple  
lines

A text with  
multiple  
lines

code

```
#include "lvgl/lvgl.h"

static void text_changer(lv_task_t * t);

lv_obj_t * labels[3];

/**
 * Create three labels to demonstrate the alignments.
 */
void lv_ex_label_3(void)
{
    /*`lv_label_set_align` is not required to align the object itself.
     * It's used only when the text has multiple lines*/

    /* Create a label on the top.
     * No additional alignment so it will be the reference*/
    labels[0] = lv_label_create(lv_scr_act(), NULL);
    lv_obj_align(labels[0], NULL, LV_ALIGN_IN_TOP_MID, 0, 5);
    lv_label_set_align(labels[0], LV_LABEL_ALIGN_CENTER);

    /* Create a label in the middle.
     * `lv_obj_align` will be called every time the text changes
     * to keep the middle position */
    labels[1] = lv_label_create(lv_scr_act(), NULL);
    lv_obj_align(labels[1], NULL, LV_ALIGN_CENTER, 0, 0);
    lv_label_set_align(labels[1], LV_LABEL_ALIGN_CENTER);

    /* Create a label in the bottom.
     * Enable auto realign. */
    labels[2] = lv_label_create(lv_scr_act(), NULL);
    lv_obj_set_auto_realign(labels[2], true);
}
```

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```
lv_obj_align(labels[2], NULL, LV_ALIGN_IN_BOTTOM_MID, 0, -5);
lv_label_set_align(labels[2], LV_LABEL_ALIGN_CENTER);

lv_task_t * t = lv_task_create(text_changer, 1000, LV_TASK_PRIO_MID, NULL);
lv_task_ready(t);
}

static void text_changer(lv_task_t * t)
{
    const char * texts[] = {"Text", "A very long text", "A text with\nmultiple\nlines", NULL};
    static uint8_t i = 0;

    lv_label_set_text(labels[0], texts[i]);
    lv_label_set_text(labels[1], texts[i]);
    lv_label_set_text(labels[2], texts[i]);

    /*Manually realign `labels[1]`*/
    lv_obj_align(labels[1], NULL, LV_ALIGN_CENTER, 0, 0);

    i++;
    if(texts[i] == NULL) i = 0;
}
```

## MicroPython

### Label recoloring and scrolling

Re-color words of a  
label and wrap long  
text automatically.

. It is a circularly scr

code

```
label1 = lv.label(lv.scr_act())
label1.set_long_mode(lv.label.LONG.BREAK)    # Break the long lines
```

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```
label1.set_recolor(True)           # Enable re-coloring by commands in the
↪text
label1.set_align(lv.label.ALIGN.CENTER)    # Center aligned lines
label1.set_text("#000080 Re-color# #0000ff words# #6666ff of a# label " +
               "and wrap long text automatically.")
label1.set_width(150)
label1.align(None, lv.ALIGN.CENTER, 0, -30)

label2 = lv.label(lv.scr_act())
label2.set_long_mode(lv.label.LONG.SROLL_CIRC)    # Circular scroll
label2.set_width(150)
label2.set_text("It is a circularly scrolling text. ")
label2.align(None, lv.ALIGN.CENTER, 0, 30)
```

### Text shadow

A simple method to create  
shadows on text  
It even works with  
  
newlines and spaces.

code

```
# Create a style for the shadow
label_style = lv.style_t()
lv.style_copy(label_style, lv.style_plain)
label_style.text.opa = lv.OPA_50

# Create a label for the shadow first (it's in the background)
shadow_label = lv.label(lv.scr_act())
shadow_label.set_style(lv.label.STYLE.MAIN, label_style)

# Create the main label
main_label = lv.label(lv.scr_act())
main_label.set_text("A simple method to create\n" +
                   "shadows on text\n" +
                   "It even works with\n\n" +
```

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```

                                "newlines    and spaces.")

# Set the same text for the shadow label
shadow_label.set_text(main_label.get_text())

# Position the main label
main_label.align(None, lv.ALIGN.CENTER, 0, 0)

# Shift the second label down and to the right by 1 pixel
shadow_label.align(main_label, lv.ALIGN.IN_TOP_LEFT, 1, 1)

```

## Align labels

A text with  
multiple  
lines

A text with  
multiple  
lines

A text with  
multiple  
lines

code

```

# Create three labels to demonstrate the alignments.
labels = []

# `lv_label_set_align` is not required to align the object itself.
# It's used only when the text has multiple lines

# Create a label on the top.
# No additional alignment so it will be the reference
label = lv.label(lv.scr_act())
label.align(None, lv.ALIGN.IN_TOP_MID, 0, 5)
label.set_align(lv.label.ALIGN.CENTER)
labels.append(label)

# Create a label in the middle.
# `lv_obj_align` will be called every time the text changes
# to keep the middle position
label = lv.label(lv.scr_act())

```

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```

label.align(None, lv.ALIGN.CENTER, 0, 0)
label.set_align(lv.label.ALIGN.CENTER)
labels.append(label)

# Create a label in the bottom.
# Enable auto realign.
label = lv.label(lv.scr_act())
label.set_auto_realign(True)
label.align(None, lv.ALIGN.IN_BOTTOM_MID, 0, -5)
label.set_align(lv.label.ALIGN.CENTER)
labels.append(label)

class TextChanger:
    """Changes texts of all labels every second"""
    def __init__(self, labels,
                 texts=["Text", "A very long text", "A text with\nmultiple\nlines"],
                 rate=1000):
        self.texts = texts
        self.labels = labels
        self.rate = rate
        self.counter = 0

    def start(self):
        lv.task_create(self.task_cb, self.rate, lv.TASK_PRIO.LOWEST, None)

    def task_cb(self, task):
        for label in labels:
            label.set_text(self.texts[self.counter])

        # Manually realalign `labels[1]`
        if len(self.labels) > 1:
            self.labels[1].align(None, lv.ALIGN.CENTER, 0, 0)

        self.counter = (self.counter + 1) % len(self.texts)

text_changer = TextChanger(labels)
text_changer.start()
    
```

## API

### Typedefs

```
typedef uint8_t lv_label_long_mode_t
```

```
typedef uint8_t lv_label_align_t
```

```
typedef uint8_t lv_label_style_t
```

### Enums

```
enum [anonymous]
```

Long mode behaviors. Used in `'lv_label_ext_t'`

Values:

#### **LV\_LABEL\_LONG\_EXPAND**

Expand the object size to the text size

#### **LV\_LABEL\_LONG\_BREAK**

Keep the object width, break the too long lines and expand the object height

#### **LV\_LABEL\_LONG\_DOT**

Keep the size and write dots at the end if the text is too long

#### **LV\_LABEL\_LONG\_SCROLL**

Keep the size and roll the text back and forth

#### **LV\_LABEL\_LONG\_SCROLL\_CIRC**

Keep the size and roll the text circularly

#### **LV\_LABEL\_LONG\_CROP**

Keep the size and crop the text out of it

**enum** [anonymous]

Label align policy

*Values:*

#### **LV\_LABEL\_ALIGN\_LEFT**

Align text to left

#### **LV\_LABEL\_ALIGN\_CENTER**

Align text to center

#### **LV\_LABEL\_ALIGN\_RIGHT**

Align text to right

#### **LV\_LABEL\_ALIGN\_AUTO**

Use LEFT or RIGHT depending on the direction of the text (LTR/RTL)

**enum** [anonymous]

Label styles

*Values:*

#### **LV\_LABEL\_STYLE\_MAIN**

### Functions

**LV\_EXPORT\_CONST\_INT**(LV\_LABEL\_DOT\_NUM)

**LV\_EXPORT\_CONST\_INT**(LV\_LABEL\_POS\_LAST)

**LV\_EXPORT\_CONST\_INT**(LV\_LABEL\_TEXT\_SEL\_OFF)

*lv\_obj\_t* \***lv\_label\_create**(*lv\_obj\_t* \**par*, **const** *lv\_obj\_t* \**copy*)

Create a label objects

**Return** pointer to the created button

**Parameters**

- **par**: pointer to an object, it will be the parent of the new label
- **copy**: pointer to a button object, if not NULL then the new object will be copied from it

**void** **lv\_label\_set\_text**(*lv\_obj\_t* \**label*, **const** char \**text*)

Set a new text for a label. Memory will be allocated to store the text by the label.

**Parameters**

- **label**: pointer to a label object
- **text**: ‘\0’ terminated character string. NULL to refresh with the current text.

void **lv\_label\_set\_text\_fmt**(*lv\_obj\_t* \*label, **const** char \*fmt, ...)

Set a new formatted text for a label. Memory will be allocated to store the text by the label.

#### Parameters

- **label**: pointer to a label object
- **fmt**: printf-like format

void **lv\_label\_set\_array\_text**(*lv\_obj\_t* \*label, **const** char \*array, uint16\_t size)

Set a new text for a label from a character array. The array don’t has to be ‘\0’ terminated. Memory will be allocated to store the array by the label.

#### Parameters

- **label**: pointer to a label object
- **array**: array of characters or NULL to refresh the label
- **size**: the size of ‘array’ in bytes

void **lv\_label\_set\_static\_text**(*lv\_obj\_t* \*label, **const** char \*text)

Set a static text. It will not be saved by the label so the ‘text’ variable has to be ‘alive’ while the label exist.

#### Parameters

- **label**: pointer to a label object
- **text**: pointer to a text. NULL to refresh with the current text.

void **lv\_label\_set\_long\_mode**(*lv\_obj\_t* \*label, *lv\_label\_long\_mode\_t* long\_mode)

Set the behavior of the label with longer text then the object size

#### Parameters

- **label**: pointer to a label object
- **long\_mode**: the new mode from ‘lv\_label\_long\_mode’ enum. In LV\_LONG\_BREAK/LONG/ROLL the size of the label should be set AFTER this function

void **lv\_label\_set\_align**(*lv\_obj\_t* \*label, *lv\_label\_align\_t* align)

Set the align of the label (left or center)

#### Parameters

- **label**: pointer to a label object
- **align**: ‘LV\_LABEL\_ALIGN\_LEFT’ or ‘LV\_LABEL\_ALIGN\_RIGHT’

void **lv\_label\_set\_recolor**(*lv\_obj\_t* \*label, bool en)

Enable the recoloring by in-line commands

#### Parameters

- **label**: pointer to a label object
- **en**: true: enable recoloring, false: disable

void **lv\_label\_set\_body\_draw**(*lv\_obj\_t* \*label, bool en)

Set the label to draw (or not draw) background specified in its style’s body

#### Parameters

- **label**: pointer to a label object
- **en**: true: draw body; false: don't draw body

void **lv\_label\_set\_anim\_speed**(*lv\_obj\_t* \*label, uint16\_t anim\_speed)  
Set the label's animation speed in LV\_LABEL\_LONG\_SCROLL/SCROLL\_CIRC modes

#### Parameters

- **label**: pointer to a label object
- **anim\_speed**: speed of animation in px/sec unit

static void **lv\_label\_set\_style**(*lv\_obj\_t* \*label, *lv\_label\_style\_t* type, const *lv\_style\_t* \*style)

Set the style of an label

#### Parameters

- **label**: pointer to an label object
- **type**: which style should be get (can be only LV\_LABEL\_STYLE\_MAIN)
- **style**: pointer to a style

void **lv\_label\_set\_text\_sel\_start**(*lv\_obj\_t* \*label, uint16\_t index)  
Set the selection start index.

#### Parameters

- **label**: pointer to a label object.
- **index**: index to set. LV\_LABEL\_TXT\_SEL\_OFF to select nothing.

void **lv\_label\_set\_text\_sel\_end**(*lv\_obj\_t* \*label, uint16\_t index)  
Set the selection end index.

#### Parameters

- **label**: pointer to a label object.
- **index**: index to set. LV\_LABEL\_TXT\_SEL\_OFF to select nothing.

char \***lv\_label\_get\_text**(const *lv\_obj\_t* \*label)  
Get the text of a label

**Return** the text of the label

#### Parameters

- **label**: pointer to a label object

*lv\_label\_long\_mode\_t* **lv\_label\_get\_long\_mode**(const *lv\_obj\_t* \*label)  
Get the long mode of a label

**Return** the long mode

#### Parameters

- **label**: pointer to a label object

*lv\_label\_align\_t* **lv\_label\_get\_align**(const *lv\_obj\_t* \*label)  
Get the align attribute

**Return** LV\_LABEL\_ALIGN\_LEFT or LV\_LABEL\_ALIGN\_CENTER

#### Parameters

- **label**: pointer to a label object

bool **lv\_label\_get\_recolor**(const *lv\_obj\_t* \*label)

Get the recoloring attribute

**Return** true: recoloring is enabled, false: disable

**Parameters**

- **label**: pointer to a label object

bool **lv\_label\_get\_body\_draw**(const *lv\_obj\_t* \*label)

Get the body draw attribute

**Return** true: draw body; false: don't draw body

**Parameters**

- **label**: pointer to a label object

uint16\_t **lv\_label\_get\_anim\_speed**(const *lv\_obj\_t* \*label)

Get the label's animation speed in LV\_LABEL\_LONG\_ROLL and SCROLL modes

**Return** speed of animation in px/sec unit

**Parameters**

- **label**: pointer to a label object

void **lv\_label\_get\_letter\_pos**(const *lv\_obj\_t* \*label, uint16\_t index, lv\_point\_t \*pos)

Get the relative x and y coordinates of a letter

**Parameters**

- **label**: pointer to a label object
- **index**: index of the letter [0 ...text length]. Expressed in character index, not byte index (different in UTF-8)
- **pos**: store the result here (E.g. index = 0 gives 0;0 coordinates)

uint16\_t **lv\_label\_get\_letter\_on**(const *lv\_obj\_t* \*label, lv\_point\_t \*pos)

Get the index of letter on a relative point of a label

**Return** the index of the letter on the 'pos\_p' point (E.g. on 0;0 is the 0. letter) Expressed in character index and not byte index (different in UTF-8)

**Parameters**

- **label**: pointer to label object
- **pos**: pointer to point with coordinates on a the label

bool **lv\_label\_is\_char\_under\_pos**(const *lv\_obj\_t* \*label, lv\_point\_t \*pos)

Check if a character is drawn under a point.

**Return** whether a character is drawn under the point

**Parameters**

- **label**: Label object
- **pos**: Point to check for characte under

static const lv\_style\_t \***lv\_label\_get\_style**(const *lv\_obj\_t* \*label, *lv\_label\_style\_t* type)

Get the style of an label object

**Return** pointer to the label's style

#### Parameters

- **label**: pointer to an label object
- **type**: which style should be get (can be only LV\_LABEL\_STYLE\_MAIN)

uint16\_t **lv\_label\_get\_text\_sel\_start**(const lv\_obj\_t \*label)

Get the selection start index.

**Return** selection start index. LV\_LABEL\_TXT\_SEL\_OFF if nothing is selected.

#### Parameters

- **label**: pointer to a label object.

uint16\_t **lv\_label\_get\_text\_sel\_end**(const lv\_obj\_t \*label)

Get the selection end index.

**Return** selection end index. LV\_LABEL\_TXT\_SEL\_OFF if nothing is selected.

#### Parameters

- **label**: pointer to a label object.

void **lv\_label\_ins\_text**(lv\_obj\_t \*label, uint32\_t pos, const char \*txt)

Insert a text to the label. The label text can not be static.

#### Parameters

- **label**: pointer to a label object
- **pos**: character index to insert. Expressed in character index and not byte index (Different in UTF-8) 0: before first char. LV\_LABEL\_POS\_LAST: after last char.
- **txt**: pointer to the text to insert

void **lv\_label\_cut\_text**(lv\_obj\_t \*label, uint32\_t pos, uint32\_t cnt)

Delete characters from a label. The label text can not be static.

#### Parameters

- **label**: pointer to a label object
- **pos**: character index to insert. Expressed in character index and not byte index (Different in UTF-8) 0: before first char.
- **cnt**: number of characters to cut

**struct lv\_label\_ext\_t**

#include <lv\_label.h> Data of label

#### Public Members

char \***text**

char \***tmp\_ptr**

char **tmp**[LV\_LABEL\_DOT\_NUM + 1]

**union** lv\_label\_ext\_t::[anonymous] **dot**

uint16\_t **dot\_end**

lv\_point\_t **offset**



```

lv_draw_label_hint_t hint
uint16_t anim_speed
uint16_t txt_sel_start
uint16_t txt_sel_end
lv_label_long_mode_t long_mode
uint8_t static_txt
uint8_t align
uint8_t recolor
uint8_t expand
uint8_t body_draw
uint8_t dot_tmp_alloc

```

## LED (lv\_led)

### Vue d' ensemble

Les LEDs sont des objets rectangulaires (ou circulaires).

### Luminosité

Vous pouvez régler leur luminosité avec `lv_led_set_bright(led, bright)`. La luminosité doit être comprise entre 0 (plus sombre) et 255 (plus clair).

### Bascule

Use `lv_led_on(led)` and `lv_led_off(led)` to set the brightness to a predefined ON or OFF value. The `lv_led_toggle(led)` toggles between the ON and OFF state.

### Styles

Les LEDs utilisent un style qui peut être défini par `lv_led_set_style(led, LV_LED_STYLE_MAIN, &style)`. To determine the appearance, the `style.body` properties are used.

Les couleurs sont assombries et la largeur de l' ombre est réduite lorsque la luminosité est faible et les valeurs nominales sont utilisées à la luminosité 255 afin de simuler un effet d' éclairage.

The default style is: `lv_style_pretty_color`. Note that, the LED doesn' t look like a LED with the default style so you should create your style. See the example below.

### Événements

Seuls les [événements génériques](#) sont envoyés par ce type d' objet.

Apprenez-en plus sur les [événements](#).

## Touches

Aucune *touche* n' est traitée par ce type d' objet.

Apprenez-en plus sur les *touches*.

## Exemple

### C

#### LED with custom style



code

```
#include "lvgl/lvgl.h"

void lv_ex_led_1(void)
{
    /*Create a style for the LED*/
    static lv_style_t style_led;
    lv_style_copy(&style_led, &lv_style_pretty_color);
    style_led.body.radius = LV_RADIUS_CIRCLE;
    style_led.body.main_color = LV_COLOR_MAKE(0xb5, 0x0f, 0x04);
    style_led.body.grad_color = LV_COLOR_MAKE(0x50, 0x07, 0x02);
    style_led.body.border.color = LV_COLOR_MAKE(0xfa, 0x0f, 0x00);
    style_led.body.border.width = 3;
    style_led.body.border.opa = LV_OPA_30;
    style_led.body.shadow.color = LV_COLOR_MAKE(0xb5, 0x0f, 0x04);
    style_led.body.shadow.width = 5;

    /*Create a LED and switch it OFF*/
    lv_obj_t * led1 = lv_led_create(lv_scr_act(), NULL);
```

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```
lv_led_set_style(led1, LV_LED_STYLE_MAIN, &style_led);
lv_obj_align(led1, NULL, LV_ALIGN_CENTER, -80, 0);
lv_led_off(led1);

/*Copy the previous LED and set a brightness*/
lv_obj_t * led2 = lv_led_create(lv_scr_act(), led1);
lv_obj_align(led2, NULL, LV_ALIGN_CENTER, 0, 0);
lv_led_set_bright(led2, 190);

/*Copy the previous LED and switch it ON*/
lv_obj_t * led3 = lv_led_create(lv_scr_act(), led1);
lv_obj_align(led3, NULL, LV_ALIGN_CENTER, 80, 0);
lv_led_on(led3);
}
```

## MicroPython

### LED with custom style



code

```
# Create a style for the LED
style_led = lv.style_t()
lv.style_copy(style_led, lv.style_pretty_color)
style_led.body.radius = 800 # large enough to draw a circle
style_led.body.main_color = lv.color_make(0xb5, 0x0f, 0x04)
style_led.body.grad_color = lv.color_make(0x50, 0x07, 0x02)
style_led.body.border.color = lv.color_make(0xfa, 0x0f, 0x00)
style_led.body.border.width = 3
style_led.body.border.opa = lv.OPA_30
style_led.body.shadow.color = lv.color_make(0xb5, 0x0f, 0x04)
```

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```
style_led.body.shadow.width = 5

# Create a LED and switch it OFF
led1 = lv.led(lv.scr_act())
led1.set_style(lv.led.STYLE.MAIN, style_led)
led1.align(None, lv.ALIGN.CENTER, -80, 0)
led1.off()

# Copy the previous LED and set a brightness
led2 = lv.led(lv.scr_act(), led1)
led2.align(None, lv.ALIGN.CENTER, 0, 0)
led2.set_bright(190)

# Copy the previous LED and switch it ON
led3 = lv.led(lv.scr_act(), led1)
led3.align(None, lv.ALIGN.CENTER, 80, 0)
led3.on()
```

## API

### Typedefs

**typedef** uint8\_t **lv\_led\_style\_t**

### Enums

**enum** [anonymous]

*Values:*

**LV\_LED\_STYLE\_MAIN**

### Functions

*lv\_obj\_t* \***lv\_led\_create**(*lv\_obj\_t* \*par, **const** *lv\_obj\_t* \*copy)

Create a led objects

**Return** pointer to the created led

**Parameters**

- **par**: pointer to an object, it will be the parent of the new led
- **copy**: pointer to a led object, if not NULL then the new object will be copied from it

void **lv\_led\_set\_bright**(*lv\_obj\_t* \*led, uint8\_t bright)

Set the brightness of a LED object

**Parameters**

- **led**: pointer to a LED object
- **bright**: 0 (max. dark) ...255 (max. light)

void **lv\_led\_on**(*lv\_obj\_t* \*led)

Light on a LED

**Parameters**

- **led**: pointer to a LED object

void **lv\_led\_off**(*lv\_obj\_t \*led*)  
Light off a LED

#### Parameters

- **led**: pointer to a LED object

void **lv\_led\_toggle**(*lv\_obj\_t \*led*)  
Toggle the state of a LED

#### Parameters

- **led**: pointer to a LED object

**static** void **lv\_led\_set\_style**(*lv\_obj\_t \*led*, *lv\_led\_style\_t type*, **const** *lv\_style\_t \*style*)  
Set the style of a led

#### Parameters

- **led**: pointer to a led object
- **type**: which style should be set (can be only LV\_LED\_STYLE\_MAIN)
- **style**: pointer to a style

uint8\_t **lv\_led\_get\_bright**(**const** *lv\_obj\_t \*led*)  
Get the brightness of a LED object

**Return** bright 0 (max. dark) ...255 (max. light)

#### Parameters

- **led**: pointer to LED object

**static const** *lv\_style\_t \****lv\_led\_get\_style**(**const** *lv\_obj\_t \*led*, *lv\_led\_style\_t type*)  
Get the style of an led object

**Return** pointer to the led' s style

#### Parameters

- **led**: pointer to an led object
- **type**: which style should be get (can be only LV\_CHART\_STYLE\_MAIN)

**struct lv\_led\_ext\_t**

#### Public Members

uint8\_t **bright**

### Ligne (lv\_line)

#### Vue d' ensemble

L' objet ligne sert à tracer des lignes droites entre un ensemble de points.

## Ensemble de points

Les points doivent être enregistrés dans un tableau `lv_point_t` et transmis à l'objet par la fonction `lv_line_set_points(line, point_array, point_cnt)`.

## Dimensionnement automatique

Il est possible de définir automatiquement les dimensions de l'objet ligne en fonction de ses points. Vous pouvez l'activer avec la fonction `lv_line_set_auto_size(line, true)`. Si activé, alors lorsque les points sont définis, la largeur et la hauteur de l'objet seront modifiées en fonction des coordonnées x et y maximales des points. Le *dimensionnement automatique* est activé par défaut.

## Y inversé

Par défaut, le point  $y == 0$  est en haut de l'objet, mais vous pouvez inverser les coordonnées y avec `lv_line_set_y_invert(line, true)`. Le *y inversé* est désactivé par défaut.

## Styles

La ligne utilise un style qui peut être défini par `lv_line_set_style(line, LV_LINE_STYLE_MAIN, &style)` et utilise toutes les propriétés `style.line`.

## Événements

Seuls les événements génériques sont envoyés par ce type d'objet.

Apprenez-en plus sur les *événements*.

## Touches

Aucune *touche* n'est traitée par ce type d'objet.

Apprenez-en plus sur les *touches*.

## Exemple

### C

## Simple Line



code

```
#include "lvgl/lvgl.h"

void lv_ex_line_1(void)
{
    /*Create an array for the points of the line*/
    static lv_point_t line_points[] = { {5, 5}, {70, 70}, {120, 10}, {180, 60}, {240, 10} };

    /*Create new style (thick dark blue)*/
    static lv_style_t style_line;
    lv_style_copy(&style_line, &lv_style_plain);
    style_line.line.color = LV_COLOR_MAKE(0x00, 0x3b, 0x75);
    style_line.line.width = 3;
    style_line.line.rounded = 1;

    /*Copy the previous line and apply the new style*/
    lv_obj_t * line1;
    line1 = lv_line_create(lv_scr_act(), NULL);
    lv_line_set_points(line1, line_points, 5); /*Set the points*/
    lv_line_set_style(line1, LV_LINE_STYLE_MAIN, &style_line);
    lv_obj_align(line1, NULL, LV_ALIGN_CENTER, 0, 0);
}
```

## MicroPython

## Simple Line



code

```
# Create an array for the points of the line
line_points = [ {"x":5, "y":5},
                 {"x":70, "y":70},
                 {"x":120, "y":10},
                 {"x":180, "y":60},
                 {"x":240, "y":10}]

# Create new style (thick dark blue)
style_line = lv.style_t()
lv.style_copy(style_line, lv.style_plain)
style_line.line.color = lv.color_make(0x00, 0x3b, 0x75)
style_line.line.width = 3
style_line.line.rounded = 1

# Copy the previous line and apply the new style
line1 = lv.line(lv.scr_act())
line1.set_points(line_points, len(line_points))      # Set the points
line1.set_style(lv.line.STYLE.MAIN, style_line)
line1.align(None, lv.ALIGN.CENTER, 0, 0)
```

## API

### Typedefs

```
typedef uint8_t lv_line_style_t
```



## Enums

**enum** [anonymous]

*Values:*

**LV\_LINE\_STYLE\_MAIN**

## Functions

*lv\_obj\_t* \***lv\_line\_create**(*lv\_obj\_t* \**par*, **const** *lv\_obj\_t* \**copy*)

Create a line objects

**Return** pointer to the created line

### Parameters

- **par**: pointer to an object, it will be the parent of the new line

void **lv\_line\_set\_points**(*lv\_obj\_t* \**line*, **const** *lv\_point\_t* *point\_a*[], *uint16\_t* *point\_num*)

Set an array of points. The line object will connect these points.

### Parameters

- **line**: pointer to a line object
- **point\_a**: an array of points. Only the address is saved, so the array can NOT be a local variable which will be destroyed
- **point\_num**: number of points in 'point\_a'

void **lv\_line\_set\_auto\_size**(*lv\_obj\_t* \**line*, **bool** *en*)

Enable (or disable) the auto-size option. The size of the object will fit to its points. (set width to x max and height to y max)

### Parameters

- **line**: pointer to a line object
- **en**: true: auto size is enabled, false: auto size is disabled

void **lv\_line\_set\_y\_invert**(*lv\_obj\_t* \**line*, **bool** *en*)

Enable (or disable) the y coordinate inversion. If enabled then y will be subtracted from the height of the object, therefore the y=0 coordinate will be on the bottom.

### Parameters

- **line**: pointer to a line object
- **en**: true: enable the y inversion, false:disable the y inversion

**static** void **lv\_line\_set\_style**(*lv\_obj\_t* \**line*, *lv\_line\_style\_t* *type*, **const** *lv\_style\_t* \**style*)

Set the style of a line

### Parameters

- **line**: pointer to a line object
- **type**: which style should be set (can be only LV\_LINE\_STYLE\_MAIN)
- **style**: pointer to a style

**bool** **lv\_line\_get\_auto\_size**(**const** *lv\_obj\_t* \**line*)

Get the auto size attribute

**Return** true: auto size is enabled, false: disabled

#### Parameters

- `line`: pointer to a line object

bool **lv\_line\_get\_y\_invert**(const *lv\_obj\_t* \**line*)

Get the y inversion attribute

**Return** true: y inversion is enabled, false: disabled

#### Parameters

- `line`: pointer to a line object

static const *lv\_style\_t* \***lv\_line\_get\_style**(const *lv\_obj\_t* \**line*, *lv\_line\_style\_t* *type*)

Get the style of an line object

**Return** pointer to the line' s style

#### Parameters

- `line`: pointer to an line object
- `type`: which style should be get (can be only LV\_LINE\_STYLE\_MAIN)

**struct lv\_line\_ext\_t**

#### Public Members

const *lv\_point\_t* \***point\_array**

uint16\_t **point\_num**

uint8\_t **auto\_size**

uint8\_t **y\_inv**

### Liste (lv\_list)

#### Vue d' ensemble

Les listes sont construites à partir d' une *page* d' arrière-plan sur laquelle sont placés des *boutons* on it. Les boutons contiennent une *image* comme icône optionnelle (qui peut être un symbole aussi) et une *étiquette*. Lorsque la liste est suffisamment longue, vous pouvez la faire défiler.

#### Ajouter des boutons

Vous pouvez ajouter de nouveaux éléments de liste avec `lv_list_add_btn(list, &icon_img, "Text")` ou avec symbole `lv_list_add_btn(list, SYMBOL_EDIT, "Edit text")`. Si vous ne souhaitez pas ajouter d' image, utilisez `NULL` comme source d' image. La fonction retourne un pointeur sur le bouton créé pour permettre d' autres configurations.

La largeur des boutons est fixée au maximum de la largeur de l' objet. La hauteur des boutons est ajustée automatiquement en fonction du contenu (*content height + padding.top + padding.bottom*).

Les étiquettes sont créées avec le mode `LV_LABEL_LONG_SCROLL_CIRC` pour faire défiler automatiquement les libellés longs de manière circulaire.

Vous pouvez utiliser `lv_list_get_btn_label(list_btn)` and `lv_list_get_btn_img(list_btn)` pour obtenir le libellé et l' image d' un bouton de liste. Vous pouvez obtenir le texte directement avec `lv_list_get_btn_text(list_btn)`.

## Supprimer des boutons

Pour supprimer un élément de la liste, utilisez simplement `lv_obj_del(btn)` sur la valeur de retour de `lv_list_add_btn()`.

Pour vider la liste (supprimer tous les boutons), utilisez `lv_list_clean(list)`

## Navigation manuelle

Vous pouvez naviguer manuellement dans la liste avec `lv_list_up(list)` et `lv_list_down(list)`.

Vous pouvez accéder directement à un bouton en utilisant `lv_list_focus(btn, LV_ANIM_ON/OFF)`.

La **durée d'animation** des déplacements haut/bas/accès direct peut être définie via : `lv_list_set_anim_time(list, anim_time)`. Zéro supprime les animations.

## Mise en page

Par défaut la liste est verticale. Pour obtenir une liste horizontale, utilisez `lv_list_set_layout(list, LV_LAYOUT_ROW_M)`.

## Mise en évidence du bord

L'animation d'un cercle peut être affichée quand la liste atteint les positions supérieure ou inférieure. `lv_list_set_edge_flash(list, en)` active cette fonctionnalité.

## Propagation du défilement

Si la liste est créée sur un autre objet défilant (comme une [page](#)) et que la liste ne peut pas être défilées plus, le **défilement peut être propagé au parent**. De cette manière, le défilement sera poursuivi sur le parent. Cela peut être activé avec `lv_list_set_scroll_propagation(list, true)`.

SI les bouton ont `lv_btn_set_toggle` activé alors `lv_list_set_single_mode(list, true)` est utilisé pour s'assurer qu'un seul bouton ne peut être dans l'état basculé à un instant donné.

## Styles

La fonction `lv_list_set_style(list, LV_LIST_STYLE ..., &style)` définit les styles d'une liste.

- **LV\_LIST\_STYLE\_BG** style d'arrière-plan de liste. Valeur par défaut : `lv_style_transp_fit`
- **LV\_LIST\_STYLE\_SCRL** style de la partie défilante. Valeur par défaut : `lv_style_pretty`
- **LV\_LIST\_STYLE\_SB** style de la barre de défilement. Valeur par défaut : `lv_style_pretty_color`. Pour plus de détails voir l'objet [page](#)
- **LV\_LIST\_STYLE\_BTN\_REL** style des boutons relâchés. Valeur par défaut : `lv_style_btn_rel`
- **LV\_LIST\_STYLE\_BTN\_PR** style des boutons pressés. Valeur par défaut : `lv_style_btn_pr`
- **LV\_LIST\_STYLE\_BTN\_TGL\_REL** style des boutons bascules relâchés. Valeur par défaut : `lv_style_btn_tgl_rel`,

- **LV\_LIST\_STYLE\_BTN\_TGL\_PR** style des boutons bascules pressés. Valeur par défaut : `lv_style_btn_tgl_pr`
- **LV\_LIST\_STYLE\_BTN\_INA** style des boutons inactifs. Valeur par défaut : `lv_style_btn_ina`.

Étant donné que *BG* a un style transparent par défaut s' il n' y a que quelques boutons, la liste paraîtra plus courte mais pourra défiler lorsque plusieurs éléments de la liste sont ajoutés.

Pour modifier la hauteur des boutons, ajustez les champs `body.padding.top/bottom` des styles relatifs (`LV_LIST_STYLE_BTN_REL/PR/...`).

## Événements

Seuls les [événements génériques](#) sont envoyés par ce type d' objet.

Apprenez-en plus sur les [événements](#).

## Touches

Les *touches* suivantes sont traitées par les listes :

- **LV\_KEY\_RIGHT/DOWN** sélectionne le bouton suivant,
- **LV\_KEY\_LEFT/UP** sélectionne le bouton précédent,

Notez que, comme d' habitude, l' état de **LV\_KEY\_ENTER** est traduit en **LV\_EVENT\_PRESSED/PRESSING/RELEASED** etc.

Les boutons sélectionnés sont dans l' état **LV\_BTN\_STATE\_PR/TG\_PR**.

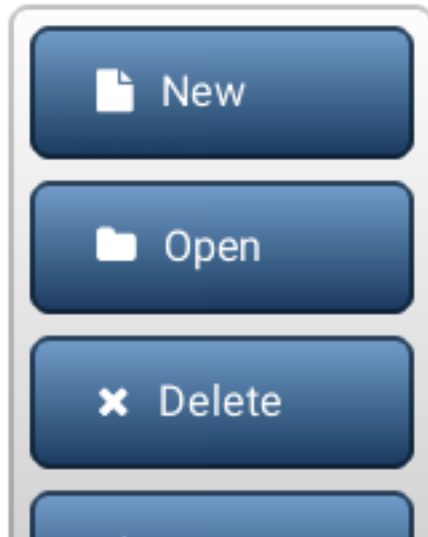
Pour sélectionner manuellement un bouton, utilisez `lv_list_set_btn_selected(list, btn)`. Lorsque la liste est défocalisée et focalisée à nouveau, le dernier bouton sélectionné est restauré.

Apprenez-en plus sur les [touches](#).

## Exemple

### C

## Simple List



code

```
#include "lvgl/lvgl.h"
#include <stdio.h>

static void event_handler(lv_obj_t * obj, lv_event_t event)
{
    if(event == LV_EVENT_CLICKED) {
        printf("Clicked: %s\n", lv_list_get_btn_text(obj));
    }
}

void lv_ex_list_1(void)
{
    /*Create a list*/
    lv_obj_t * list1 = lv_list_create(lv_scr_act(), NULL);
    lv_obj_set_size(list1, 160, 200);
    lv_obj_align(list1, NULL, LV_ALIGN_CENTER, 0, 0);

    /*Add buttons to the list*/

    lv_obj_t * list_btn;

    list_btn = lv_list_add_btn(list1, LV_SYMBOL_FILE, "New");
    lv_obj_set_event_cb(list_btn, event_handler);

    list_btn = lv_list_add_btn(list1, LV_SYMBOL_DIRECTORY, "Open");
    lv_obj_set_event_cb(list_btn, event_handler);

    list_btn = lv_list_add_btn(list1, LV_SYMBOL_CLOSE, "Delete");
    lv_obj_set_event_cb(list_btn, event_handler);

    list_btn = lv_list_add_btn(list1, LV_SYMBOL_EDIT, "Edit");
```

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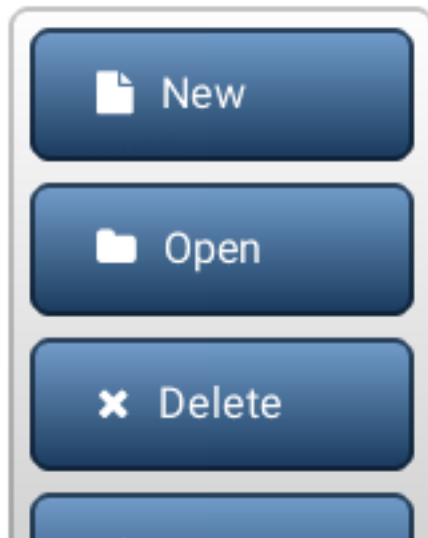
(continued from previous page)

```
lv_obj_set_event_cb(list_btn, event_handler);

list_btn = lv_list_add_btn(list1, LV_SYMBOL_SAVE, "Save");
lv_obj_set_event_cb(list_btn, event_handler);
}
```

## MicroPython

### Simple List



code

```
def event_handler(obj, event):
    if event == lv.EVENT.CLICKED:
        print("Clicked: %s" % lv.list.get_btn_text(obj))

# Create a list
list1 = lv.list(lv.scr_act())
list1.set_size(160, 200)
list1.align(None, lv.ALIGN.CENTER, 0, 0)

# Add buttons to the list

list_btn = list1.add_btn(lv.SYMBOL.FILE, "New")
list_btn.set_event_cb(event_handler)

list_btn = list1.add_btn(lv.SYMBOL.DIRECTORY, "Open")
list_btn.set_event_cb(event_handler)

list_btn = list1.add_btn(lv.SYMBOL.CLOSE, "Delete")
list_btn.set_event_cb(event_handler)
```

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```
list_btn = list1.add_btn(lv.SYMBOL.EDIT, "Edit")
list_btn.set_event_cb(event_handler)

list_btn = list1.add_btn(lv.SYMBOL.SAVE, "Save")
list_btn.set_event_cb(event_handler)
```

## API

### Typedefs

**typedef** uint8\_t **lv\_list\_style\_t**

### Enums

**enum** [anonymous]

List styles.

*Values:*

**LV\_LIST\_STYLE\_BG**

List background style

**LV\_LIST\_STYLE\_SCRL**

List scrollable area style.

**LV\_LIST\_STYLE\_SB**

List scrollbar style.

**LV\_LIST\_STYLE\_EDGE\_FLASH**

List edge flash style.

**LV\_LIST\_STYLE\_BTN\_REL**

Same meaning as the ordinary button styles.

**LV\_LIST\_STYLE\_BTN\_PR**

**LV\_LIST\_STYLE\_BTN\_TGL\_REL**

**LV\_LIST\_STYLE\_BTN\_TGL\_PR**

**LV\_LIST\_STYLE\_BTN\_INA**

### Functions

*lv\_obj\_t* \***lv\_list\_create**(*lv\_obj\_t* \*par, const *lv\_obj\_t* \*copy)

Create a list objects

**Return** pointer to the created list

**Parameters**

- **par**: pointer to an object, it will be the parent of the new list
- **copy**: pointer to a list object, if not NULL then the new object will be copied from it

void **lv\_list\_clean**(*lv\_obj\_t* \*list)

Delete all children of the scrl object, without deleting scrl child.

#### Parameters

- **list**: pointer to an object

*lv\_obj\_t* \***lv\_list\_add\_btn**(*lv\_obj\_t* \**list*, **const** void \**img\_src*, **const** char \**txt*)

Add a list element to the list

**Return** pointer to the new list element which can be customized (a button)

#### Parameters

- **list**: pointer to list object
- **img\_fn**: file name of an image before the text (NULL if unused)
- **txt**: text of the list element (NULL if unused)

bool **lv\_list\_remove**(**const** *lv\_obj\_t* \**list*, uint16\_t *index*)

Remove the index of the button in the list

**Return** true: successfully deleted

#### Parameters

- **list**: pointer to a list object
- **index**: pointer to a the button' s index in the list, index must be  $0 \leq \text{index} < \text{lv\_list\_ext\_t.size}$

void **lv\_list\_set\_single\_mode**(*lv\_obj\_t* \**list*, bool *mode*)

Set single button selected mode, only one button will be selected if enabled.

#### Parameters

- **list**: pointer to the currently pressed list object
- **mode**: enable(true)/disable(false) single selected mode.

void **lv\_list\_set\_btn\_selected**(*lv\_obj\_t* \**list*, *lv\_obj\_t* \**btn*)

Make a button selected

#### Parameters

- **list**: pointer to a list object
- **btn**: pointer to a button to select NULL to not select any buttons

**static** void **lv\_list\_set\_sb\_mode**(*lv\_obj\_t* \**list*, *lv\_sb\_mode\_t* *mode*)

Set the scroll bar mode of a list

#### Parameters

- **list**: pointer to a list object
- **sb\_mode**: the new mode from 'lv\_page\_sb\_mode\_t' enum

**static** void **lv\_list\_set\_scroll\_propagation**(*lv\_obj\_t* \**list*, bool *en*)

Enable the scroll propagation feature. If enabled then the List will move its parent if there is no more space to scroll.

#### Parameters

- **list**: pointer to a List
- **en**: true or false to enable/disable scroll propagation

**static** void **lv\_list\_set\_edge\_flash**(*lv\_obj\_t* \**list*, bool *en*)

Enable the edge flash effect. (Show an arc when the an edge is reached)



#### Parameters

- **list**: pointer to a List
- **en**: true or false to enable/disable end flash

**static void lv\_list\_set\_anim\_time**(*lv\_obj\_t* \*list, uint16\_t anim\_time)  
Set scroll animation duration on 'list\_up()' 'list\_down()' 'list\_focus()'

#### Parameters

- **list**: pointer to a list object
- **anim\_time**: duration of animation [ms]

**void lv\_list\_set\_style**(*lv\_obj\_t* \*list, *lv\_list\_style\_t* type, **const** *lv\_style\_t* \*style)  
Set a style of a list

#### Parameters

- **list**: pointer to a list object
- **type**: which style should be set
- **style**: pointer to a style

**void lv\_list\_set\_layout**(*lv\_obj\_t* \*list, *lv\_layout\_t* layout)  
Set layout of a list

#### Parameters

- **list**: pointer to a list object
- **layout**: which layout should be used

**bool lv\_list\_get\_single\_mode**(*lv\_obj\_t* \*list)  
Get single button selected mode.

#### Parameters

- **list**: pointer to the currently pressed list object.

**const char \*lv\_list\_get\_btn\_text**(**const** *lv\_obj\_t* \*btn)  
Get the text of a list element

**Return** pointer to the text

#### Parameters

- **btn**: pointer to list element

*lv\_obj\_t* \***lv\_list\_get\_btn\_label**(**const** *lv\_obj\_t* \*btn)  
Get the label object from a list element

**Return** pointer to the label from the list element or NULL if not found

#### Parameters

- **btn**: pointer to a list element (button)

*lv\_obj\_t* \***lv\_list\_get\_btn\_img**(**const** *lv\_obj\_t* \*btn)  
Get the image object from a list element

**Return** pointer to the image from the list element or NULL if not found

#### Parameters

- **btn**: pointer to a list element (button)

*lv\_obj\_t* \***lv\_list\_get\_prev\_btn**(const *lv\_obj\_t* \*list, *lv\_obj\_t* \*prev\_btn)

Get the next button from list. (Starts from the bottom button)

**Return** pointer to the next button or NULL when no more buttons

**Parameters**

- **list**: pointer to a list object
- **prev\_btn**: pointer to button. Search the next after it.

*lv\_obj\_t* \***lv\_list\_get\_next\_btn**(const *lv\_obj\_t* \*list, *lv\_obj\_t* \*prev\_btn)

Get the previous button from list. (Starts from the top button)

**Return** pointer to the previous button or NULL when no more buttons

**Parameters**

- **list**: pointer to a list object
- **prev\_btn**: pointer to button. Search the previous before it.

int32\_t **lv\_list\_get\_btn\_index**(const *lv\_obj\_t* \*list, const *lv\_obj\_t* \*btn)

Get the index of the button in the list

**Return** the index of the button in the list, or -1 of the button not in this list

**Parameters**

- **list**: pointer to a list object. If NULL, assumes btn is part of a list.
- **btn**: pointer to a list element (button)

uint16\_t **lv\_list\_get\_size**(const *lv\_obj\_t* \*list)

Get the number of buttons in the list

**Return** the number of buttons in the list

**Parameters**

- **list**: pointer to a list object

*lv\_obj\_t* \***lv\_list\_get\_btn\_selected**(const *lv\_obj\_t* \*list)

Get the currently selected button. Can be used while navigating in the list with a keypad.

**Return** pointer to the selected button

**Parameters**

- **list**: pointer to a list object

*lv\_layout\_t* **lv\_list\_get\_layout**(*lv\_obj\_t* \*list)

Get layout of a list

**Return** layout of the list object

**Parameters**

- **list**: pointer to a list object

static *lv\_sb\_mode\_t* **lv\_list\_get\_sb\_mode**(const *lv\_obj\_t* \*list)

Get the scroll bar mode of a list

**Return** scrollbar mode from 'lv\_page\_sb\_mode\_t' enum

**Parameters**

- **list**: pointer to a list object

**static** bool **lv\_list\_get\_scroll\_propagation**(*lv\_obj\_t \*list*)

Get the scroll propagation property

**Return** true or false

**Parameters**

- **list**: pointer to a List

**static** bool **lv\_list\_get\_edge\_flash**(*lv\_obj\_t \*list*)

Get the scroll propagation property

**Return** true or false

**Parameters**

- **list**: pointer to a List

**static** uint16\_t **lv\_list\_get\_anim\_time**(**const** *lv\_obj\_t \*list*)

Get scroll animation duration

**Return** duration of animation [ms]

**Parameters**

- **list**: pointer to a list object

**const** lv\_style\_t \***lv\_list\_get\_style**(**const** *lv\_obj\_t \*list*, *lv\_list\_style\_t type*)

Get a style of a list

**Return** style pointer to a style

**Parameters**

- **list**: pointer to a list object
- **type**: which style should be get

void **lv\_list\_up**(**const** *lv\_obj\_t \*list*)

Move the list elements up by one

**Parameters**

- **list**: pointer a to list object

void **lv\_list\_down**(**const** *lv\_obj\_t \*list*)

Move the list elements down by one

**Parameters**

- **list**: pointer to a list object

void **lv\_list\_focus**(**const** *lv\_obj\_t \*btn*, *lv\_anim\_enable\_t anim*)

Focus on a list button. It ensures that the button will be visible on the list.

**Parameters**

- **btn**: pointer to a list button to focus
- **anim**: LV\_ANOM\_ON: scroll with animation, LV\_ANIM\_OFF: without animation

**struct** **lv\_list\_ext\_t**

## Public Members

```

lv_page_ext_t page
const lv_style_t *styles_btn[_LV_BTN_STATE_NUM]
const lv_style_t *style_img
uint16_t size
uint8_t single_mode
lv_obj_t *last_sel
lv_obj_t *selected_btn
lv_obj_t *last_clicked_btn

```

## Compteur (lv\_lmeter)

### Vue d' ensemble

L' objet compteur est constitué de quelques lignes radiales qui dessinent une graduation.

### Définir la valeur

Lors de la définition d' une nouvelle valeur avec `lv_lmeter_set_value(lmeter, new_value)`, la partie proportionnelle de la graduation sera recolorée.

### Intervalle et angles

La fonction `lv_lmeter_set_range(lmeter, min, max)` définit l' intervalle du compteur linéaire.

Vous pouvez définir l' angle de la graduation et le nombre de lignes à l' aide de : `lv_lmeter_set_scale(lmeter, angle, line_num)`. L' angle par défaut est 240 et le nombre de ligne par défaut est 31.

### Décalage d' angle

Par défaut, l' angle de la graduation est interprété symétriquement à l' axe y. Il en résulte un compteur de ligne “debout”. Avec `lv_lmeter_set_angle_offset` un décalage peut être ajouté à l' angle de la graduation. Cela peut être utilisé par exemple pour placer un compteur linéaire d' un quart de cercle dans un coin ou d' un demi-cercle sur le côté droit ou gauche.

## Styles

Le compteur utilise un style qui peut être défini par `lv_lmeter_set_style(lmeter, LV_LMETER_STYLE_MAIN, &style)`. Les propriétés du compteur sont dérivées des attributs de style suivants :

- **line.color** la couleur des “lignes inactives” qui sont supérieure à la valeur actuelle
- **body.main\_color** couleur de la “ligne active” au début de l' échelle

- **body.grad\_color** couleur de la “ligne active” à la fin de la graduation (dégradé avec la couleur principale)
- **body.padding.hor** longueur des lignes
- **line.width** largeur des lignes

Le style par défaut est `lv_style_pretty_color`.

## Événements

Seuls les [événements génériques](#) sont envoyés par ce type d’ objet.

Apprenez-en plus sur les [événements](#).

## Touches

Aucune *touche* n’ est traitée par ce type d’ objet.

Apprenez-en plus sur les [touches](#).

## Exemple

### C

#### Simple Line meter



code

```
#include "lvgl/lvgl.h"

void lv_ex_lmeter_1(void)
{
    /*Create a style for the line meter*/
    static lv_style_t style_lmeter;
    lv_style_copy(&style_lmeter, &lv_style_pretty_color);
    style_lmeter.line.width = 2;
    style_lmeter.line.color = LV_COLOR_SILVER;
    style_lmeter.body.main_color = lv_color_hex(0x91bfed);           /*Light blue*/
    style_lmeter.body.grad_color = lv_color_hex(0x04386c);          /*Dark blue*/
    style_lmeter.body.padding.left = 16;                             /*Line length*/

    /*Create a line meter */
    lv_obj_t * lmeter;
    lmeter = lv_lmeter_create(lv_scr_act(), NULL);
    lv_lmeter_set_range(lmeter, 0, 100);                             /*Set the range*/
    lv_lmeter_set_value(lmeter, 80);                                 /*Set the current value*/
    lv_lmeter_set_scale(lmeter, 240, 31);                           /*Set the angle and number of lines*/
    lv_lmeter_set_style(lmeter, LV_LMETER_STYLE_MAIN, &style_lmeter);
    /*Apply the new style*/
    lv_obj_set_size(lmeter, 150, 150);
    lv_obj_align(lmeter, NULL, LV_ALIGN_CENTER, 0, 0);
}
```

## MicroPython

### Simple Line meter



code

```
# Create a style for the line meter
style_lmeter = lv.style_t()
lv.style_copy(style_lmeter, lv.style_pretty_color)
style_lmeter.line.width = 2
style_lmeter.line.color = lv.color_hex(0xc0c0c0)           # Silver
style_lmeter.body.main_color = lv.color_hex(0x91bfed)      # Light blue
style_lmeter.body.grad_color = lv.color_hex(0x04386c)      # Dark blue
style_lmeter.body.padding.left = 16                         # Line length

# Create a line meter
lmeter = lv.lmeter(lv.scr_act())
lmeter.set_range(0, 100)                                     # Set the range
lmeter.set_value(80)                                         # Set the current value
lmeter.set_scale(240, 31)                                    # Set the angle and number of lines
lmeter.set_style(lv.lmeter.STYLE.MAIN, style_lmeter)        # Apply the new style
lmeter.set_size(150, 150)
lmeter.align(None, lv.ALIGN.CENTER, 0, 0)
```

## API

### Typedefs

**typedef** uint8\_t **lv\_lmeter\_style\_t**

### Enums

**enum** [anonymous]

Values:

**LV\_LMETER\_STYLE\_MAIN**

### Functions

*lv\_obj\_t* \***lv\_lmeter\_create**(*lv\_obj\_t* \*par, const *lv\_obj\_t* \*copy)

Create a line meter objects

**Return** pointer to the created line meter

#### Parameters

- **par**: pointer to an object, it will be the parent of the new line meter
- **copy**: pointer to a line meter object, if not NULL then the new object will be copied from it

void **lv\_lmeter\_set\_value**(*lv\_obj\_t* \*lmeter, int16\_t value)

Set a new value on the line meter

#### Parameters

- **lmeter**: pointer to a line meter object
- **value**: new value

void **lv\_lmeter\_set\_range**(*lv\_obj\_t* \*lmeter, int16\_t min, int16\_t max)

Set minimum and the maximum values of a line meter

#### Parameters

- **lmeter**: pointer to the line meter object
- **min**: minimum value
- **max**: maximum value

void **lv\_lmeter\_set\_scale**(*lv\_obj\_t* \**lmeter*, uint16\_t *angle*, uint16\_t *line\_cnt*)

Set the scale settings of a line meter

**Parameters**

- **lmeter**: pointer to a line meter object
- **angle**: angle of the scale (0..360)
- **line\_cnt**: number of lines

void **lv\_lmeter\_set\_angle\_offset**(*lv\_obj\_t* \**lmeter*, uint16\_t *angle*)

Set the set an offset for the line meter's angles to rotate it.

**Parameters**

- **lmeter**: pointer to a line meter object
- **angle**: angle offset (0..360), rotates clockwise

static void **lv\_lmeter\_set\_style**(*lv\_obj\_t* \**lmeter*, *lv\_lmeter\_style\_t* *type*, lv\_style\_t \**style*)

Set the styles of a line meter

**Parameters**

- **lmeter**: pointer to a line meter object
- **type**: which style should be set (can be only LV\_LMETER\_STYLE\_MAIN)
- **style**: set the style of the line meter

int16\_t **lv\_lmeter\_get\_value**(const *lv\_obj\_t* \**lmeter*)

Get the value of a line meter

**Return** the value of the line meter

**Parameters**

- **lmeter**: pointer to a line meter object

int16\_t **lv\_lmeter\_get\_min\_value**(const *lv\_obj\_t* \**lmeter*)

Get the minimum value of a line meter

**Return** the minimum value of the line meter

**Parameters**

- **lmeter**: pointer to a line meter object

int16\_t **lv\_lmeter\_get\_max\_value**(const *lv\_obj\_t* \**lmeter*)

Get the maximum value of a line meter

**Return** the maximum value of the line meter

**Parameters**

- **lmeter**: pointer to a line meter object

uint16\_t **lv\_lmeter\_get\_line\_count**(const *lv\_obj\_t* \**lmeter*)

Get the scale number of a line meter

**Return** number of the scale units



#### Parameters

- `lmeter`: pointer to a line meter object

uint16\_t **lv\_lmeter\_get\_scale\_angle**(const lv\_obj\_t \*lmeter)

Get the scale angle of a line meter

**Return** angle of the scale

#### Parameters

- `lmeter`: pointer to a line meter object

uint16\_t **lv\_lmeter\_get\_angle\_offset**(lv\_obj\_t \*lmeter)

get the set an offset for the line meter.

**Return** angle offset (0..360)

#### Parameters

- `lmeter`: pointer to a line meter object

static const lv\_style\_t \***lv\_lmeter\_get\_style**(const lv\_obj\_t \*lmeter, lv\_lmeter\_style\_t type)

Get the style of a line meter

**Return** pointer to the line meter's style

#### Parameters

- `lmeter`: pointer to a line meter object
- `type`: which style should be get (can be only LV\_LMETER\_STYLE\_MAIN)

**struct lv\_lmeter\_ext\_t**

#### Public Members

uint16\_t **scale\_angle**

uint16\_t **angle\_ofs**

uint16\_t **line\_cnt**

int16\_t **cur\_value**

int16\_t **min\_value**

int16\_t **max\_value**

### Boîte de message (lv\_mbox)

#### Vue d' ensemble

Les boîtes de message font office de fenêtres contextuelles. Elles sont construites à partir d' un *conteneur* de fond, d' un *label* et d' une *matrice de boutons*.

Le texte sera automatiquement divisé en plusieurs lignes (mode LV\_LABEL\_LONG\_MODE\_BREAK) et la hauteur sera définie automatiquement pour afficher le texte et les boutons (LV\_FIT\_TIGHT ajustement automatique vertical)-

## Définir le texte

Pour définir le texte, utilisez la fonction `lv_mbox_set_text(mbox, "My text")`.

## Ajouter des boutons

Pour ajouter des boutons, utilisez la fonction `lv_mbox_add_btns(mbox, btn_str)`. Vous devez spécifier le texte des boutons ainsi `const char * btn_str[] = {"Apply", "Close", ""}`. Pour plus d'informations, consultez la documentation de la *matrice de boutons*.

## Fermeture automatique

Avec `lv_mbox_start_auto_close(mbox, delay)` la boîte de message peut être fermée automatiquement après `delay` millisecondes avec une animation. La fonction `lv_mbox_stop_auto_close(mbox)` arrête une fermeture automatique en cours.

La durée de l'animation de fermeture peut être définie par `lv_mbox_set_anim_time(mbox, anim_time)`.

## Styles

Utilisez `lv_mbox_set_style(mbox, LV_MBOX_STYLE ..., &style)` pour définir un nouveau style pour un élément de la boîte de message :

- **LV\_MBOX\_STYLE\_BG** spécifie le style du conteneur d'arrière-plan. `style.body` définit l'arrière-plan et `style.label` définit l'apparence du texte. Valeur par défaut : `lv_style_pretty`
- **LV\_MBOX\_STYLE\_BTN\_BG** style de l'arrière-plan de la matrice de boutons. Valeur par défaut : `lv_style_trans`
- **LV\_MBOX\_STYLE\_BTN\_REL** style des boutons relâchés. Valeur par défaut : `lv_style_btn_rel`
- **LV\_MBOX\_STYLE\_BTN\_PR** style des boutons pressés. Valeur par défaut : `lv_style_btn_pr`
- **LV\_MBOX\_STYLE\_BTN\_TGL\_REL** style des boutons bascules relâchés. Valeur par défaut : `lv_style_btn_tgl_rel`
- **LV\_MBOX\_STYLE\_BTN\_TGL\_PR** style des boutons bascules pressés. Valeur par défaut : `lv_style_btn_tgl_pr`
- **LV\_MBOX\_STYLE\_BTN\_INA** style des boutons inactifs. Valeur par défaut : `lv_style_btn_ina`.

La hauteur de la zone des boutons est égal à `font height + padding.top + padding.bottom` de `LV_MBOX_STYLE_BTN_REL`.

## Événements

Outre les [événements génériques](/overview/event.html #evenements-generiques), les événements spéciaux suivants sont envoyés par les boîtes de message :

- **LV\_EVENT\_VALUE\_CHANGED** envoyé lorsque le bouton est cliqué. Les données d'événement sont l'ID du bouton cliqué.

La boîte de message a une fonction de rappel par défaut qui la referme lorsqu' un clic est effectué sur un bouton.

Apprenez-en plus sur les *événements*.

## Touches

Les *touches* suivantes sont traitées par les boutons :

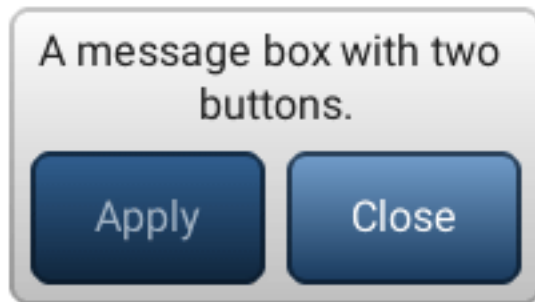
- **LV\_KEY\_RIGHT/DOWN** sélectionne le bouton suivant,
- **LV\_KEY\_LEFT/UP** sélectionne le bouton précédent,
- **LV\_KEY\_ENTER** pour clique le bouton sélectionné.

Apprenez-en plus sur les *touches*.

## Exemple

### C

#### Simple Message box



code

```
#include "lvgl/lvgl.h"
#include <stdio.h>

static void event_handler(lv_obj_t * obj, lv_event_t event)
{
    if(event == LV_EVENT_VALUE_CHANGED) {
        printf("Button: %s\n", lv_mbox_get_active_btn_text(obj));
    }
}
```

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```
void lv_ex_mbox_1(void)
{
    static const char * btns[] ={"Apply", "Close", ""};

    lv_obj_t * mbox1 = lv_mbox_create(lv_scr_act(), NULL);
    lv_mbox_set_text(mbox1, "A message box with two buttons.");
    lv_mbox_add_btns(mbox1, btns);
    lv_obj_set_width(mbox1, 200);
    lv_obj_set_event_cb(mbox1, event_handler);
    lv_obj_align(mbox1, NULL, LV_ALIGN_CENTER, 0, 0); /*Align to the corner*/
}
```

## Modal



code

```
/**
 * @file lv_ex_mbox_2.c
 *
 */

/*****
 * INCLUDES
 *****/

#include "lvgl/lvgl.h"

/*****
 * STATIC PROTOTYPES
 *****/
```

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```

static void mbox_event_cb(lv_obj_t *obj, lv_event_t evt);
static void btn_event_cb(lv_obj_t *btn, lv_event_t evt);

/*****
 *   STATIC VARIABLES
 *****/

static lv_obj_t *mbox, *info;

static const char welcome_info[] = "Welcome to the modal message box demo!\n"
    "Press the button to display a message box.";

static const char in_msg_info[] = "Notice that you cannot touch "
    "the button again while the message box is open.";

/*****
 *   GLOBAL FUNCTIONS
 *****/

void lv_ex_mbox_2(void)
{
    /* Create a button, then set its position and event callback */
    lv_obj_t *btn = lv_btn_create(lv_scr_act(), NULL);
    lv_obj_set_size(btn, 200, 60);
    lv_obj_set_event_cb(btn, btn_event_cb);
    lv_obj_align(btn, NULL, LV_ALIGN_IN_TOP_LEFT, 20, 20);

    /* Create a label on the button */
    lv_obj_t *label = lv_label_create(btn, NULL);
    lv_label_set_text(label, "Display a message box!");

    /* Create an informative label on the screen */
    info = lv_label_create(lv_scr_act(), NULL);
    lv_label_set_text(info, welcome_info);
    lv_label_set_long_mode(info, LV_LABEL_LONG_BREAK); /* Make sure text will
↳wrap */
    lv_obj_set_width(info, LV_HOR_RES - 10);
    lv_obj_align(info, NULL, LV_ALIGN_IN_BOTTOM_LEFT, 5, -5);
}

/*****
 *   STATIC FUNCTIONS
 *****/

static void mbox_event_cb(lv_obj_t *obj, lv_event_t evt)
{
    if(evt == LV_EVENT_DELETE && obj == mbox) {
        /* Delete the parent modal background */
        lv_obj_del_async(lv_obj_get_parent(mbox));
        mbox = NULL; /* happens before object is actually deleted! */
        lv_label_set_text(info, welcome_info);
    } else if(evt == LV_EVENT_VALUE_CHANGED) {
        /* A button was clicked */
        lv_mbox_start_auto_close(mbox, 0);
    }
}

```

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```

    }
}

static void btn_event_cb(lv_obj_t *btn, lv_event_t evt)
{
    if(evt == LV_EVENT_CLICKED) {
        static lv_style_t modal_style;
        /* Create a full-screen background */
        lv_style_copy(&modal_style, &lv_style_plain_color);

        /* Set the background's style */
        modal_style.body.main_color = modal_style.body.grad_color = LV_COLOR_
↪BLACK;
        modal_style.body.opa = LV_OPA_50;

        /* Create a base object for the modal background */
        lv_obj_t *obj = lv_obj_create(lv_scr_act(), NULL);
        lv_obj_set_style(obj, &modal_style);
        lv_obj_set_pos(obj, 0, 0);
        lv_obj_set_size(obj, LV_HOR_RES, LV_VER_RES);
        lv_obj_set_opa_scale_enable(obj, true); /* Enable opacity scaling for ↪
↪the animation */

        static const char * btns2[] = {"Ok", "Cancel", ""};

        /* Create the message box as a child of the modal background */
        mbox = lv_mbox_create(obj, NULL);
        lv_mbox_add_btns(mbox, btns2);
        lv_mbox_set_text(mbox, "Hello world!");
        lv_obj_align(mbox, NULL, LV_ALIGN_CENTER, 0, 0);
        lv_obj_set_event_cb(mbox, mbox_event_cb);

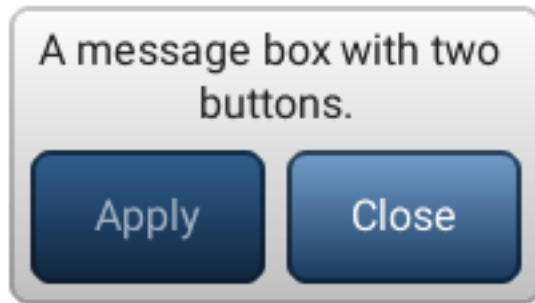
        /* Fade the message box in with an animation */
        lv_anim_t a;
        lv_anim_init(&a);
        lv_anim_set_time(&a, 500, 0);
        lv_anim_set_values(&a, LV_OPA_TRANSP, LV_OPA_COVER);
        lv_anim_set_exec_cb(&a, obj, (lv_anim_exec_xcb_t)lv_obj_set_opa_
↪scale);
        lv_anim_create(&a);

        lv_label_set_text(info, in_msg_info);
        lv_obj_align(info, NULL, LV_ALIGN_IN_BOTTOM_LEFT, 5, -5);
    }
}

```

## MicroPython

## Simple Message box



code

```
def event_handler(obj, event):
    if event == lv.EVENT.VALUE_CHANGED:
        print("Button: %s" % lv.mbox.get_active_btn_text(obj))

btns = ["Apply", "Close", ""]

mbox1 = lv.mbox(lv.scr_act())
mbox1.set_text("A message box with two buttons.");
mbox1.add_btns(btns)
mbox1.set_width(200)
mbox1.set_event_cb(event_handler)
mbox1.align(None, lv.ALIGN.CENTER, 0, 0) # Align to the corner
```

## Modal



code

```
welcome_info = "Welcome to the modal message box demo!\nPress the button to display a
↳message box."
in_msg_info = "Notice that you cannot touch the button again while the message box is
↳open."

class Modal(lv.mbox):
    """mbox with semi-transparent background"""
    def __init__(self, parent, *args, **kwargs):
        # Create a full-screen background
        modal_style = lv.style_t()
        lv.style_copy(modal_style, lv.style_plain_color)
        # Set the background's style
        modal_style.body.main_color = modal_style.body.grad_color = lv.color_make(0,0,
↳0)
        modal_style.body.opa = lv.OPA._50

        # Create a base object for the modal background
        self.bg = lv.obj(parent)
        self.bg.set_style(modal_style)
        self.bg.set_pos(0, 0)
        self.bg.set_size(parent.get_width(), parent.get_height())
        self.bg.set_opa_scale_enable(True) # Enable opacity scaling for the animation

        super().__init__(self.bg, *args, **kwargs)
        self.align(None, lv.ALIGN.CENTER, 0, 0)

        # Fade the message box in with an animation
        a = lv.anim_t()
        lv.anim_init(a)
        lv.anim_set_time(a, 500, 0)
        lv.anim_set_values(a, lv.OPA.TRANSP, lv.OPA.COVER)
```

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```

        lv.anim_set_exec_cb(a, self.bg, lv.obj.set_opa_scale)
        lv.anim_create(a)
        super().set_event_cb(self.default_callback)

    def set_event_cb(self, callback):
        self.callback = callback

    def get_event_cb(self):
        return self.callback

    def default_callback(self, obj, evt):
        if evt == lv.EVENT.DELETE: # and obj == self:
            # Delete the parent modal background
            self.get_parent().del_async()
        elif evt == lv.EVENT.VALUE_CHANGED:
            # A button was clicked
            self.start_auto_close(0)
            # Call user-defined callback
            if self.callback is not None:
                self.callback(obj, evt)

    def mbox_event_cb(obj, evt):
        if evt == lv.EVENT.DELETE:
            info.set_text(welcome_info)

    def btn_event_cb(btn, evt):
        if evt == lv.EVENT.CLICKED:

            btns2 = ["Ok", "Cancel", ""]

            # Create the message box as a child of the modal background
            mbox = Modal(lv.scr_act())
            mbox.add_btns(btns2)
            mbox.set_text("Hello world!")
            mbox.set_event_cb(mbox_event_cb)

            info.set_text(in_msg_info)
            info.align(None, lv.ALIGN.IN_BOTTOM_LEFT, 5, -5)

# Get active screen
scr = lv.scr_act()

# Create a button, then set its position and event callback
btn = lv.btn(scr)
btn.set_size(200, 60)
btn.set_event_cb(btn_event_cb)
btn.align(None, lv.ALIGN.IN_TOP_LEFT, 20, 20)

# Create a label on the button
label = lv.label(btn)
label.set_text("Display a message box!")

# Create an informative label on the screen
info = lv.label(scr)
info.set_text(welcome_info)
info.set_long_mode(lv.label.LONG.BREAK) # Make sure text will wrap
    
```

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```
info.set_width(scr.get_width() - 10)
info.align(None, lv.ALIGN.IN_BOTTOM_LEFT, 5, -5)
```

## API

### Typedefs

**typedef** uint8\_t **lv\_mbox\_style\_t**

### Enums

**enum** [anonymous]

Message box styles.

*Values:*

**LV\_MBOX\_STYLE\_BG**

**LV\_MBOX\_STYLE\_BTN\_BG**

Same meaning as ordinary button styles.

**LV\_MBOX\_STYLE\_BTN\_REL**

**LV\_MBOX\_STYLE\_BTN\_PR**

**LV\_MBOX\_STYLE\_BTN\_TGL\_REL**

**LV\_MBOX\_STYLE\_BTN\_TGL\_PR**

**LV\_MBOX\_STYLE\_BTN\_INA**

### Functions

*lv\_obj\_t* \***lv\_mbox\_create**(*lv\_obj\_t* \*par, **const** *lv\_obj\_t* \*copy)

Create a message box objects

**Return** pointer to the created message box

**Parameters**

- **par**: pointer to an object, it will be the parent of the new message box
- **copy**: pointer to a message box object, if not NULL then the new object will be copied from it

**void** **lv\_mbox\_add\_btns**(*lv\_obj\_t* \*mbox, **const** char \*btn\_mapaction[])

Add button to the message box

**Parameters**

- **mbox**: pointer to message box object
- **btn\_map**: button descriptor (button matrix map). E.g. a const char \*txt[] = { “ok” , “close” , “” } (Can not be local variable)

**void** **lv\_mbox\_set\_text**(*lv\_obj\_t* \*mbox, **const** char \*txt)

Set the text of the message box

**Parameters**

- **mbox**: pointer to a message box
- **txt**: a ‘\0’ terminated character string which will be the message box text

void **lv\_mbox\_set\_anim\_time**(*lv\_obj\_t* \*mbox, uint16\_t anim\_time)  
Set animation duration

#### Parameters

- **mbox**: pointer to a message box object
- **anim\_time**: animation length in milliseconds (0: no animation)

void **lv\_mbox\_start\_auto\_close**(*lv\_obj\_t* \*mbox, uint16\_t delay)  
Automatically delete the message box after a given time

#### Parameters

- **mbox**: pointer to a message box object
- **delay**: a time (in milliseconds) to wait before delete the message box

void **lv\_mbox\_stop\_auto\_close**(*lv\_obj\_t* \*mbox)  
Stop the auto. closing of message box

#### Parameters

- **mbox**: pointer to a message box object

void **lv\_mbox\_set\_style**(*lv\_obj\_t* \*mbox, *lv\_mbox\_style\_t* type, const *lv\_style\_t* \*style)  
Set a style of a message box

#### Parameters

- **mbox**: pointer to a message box object
- **type**: which style should be set
- **style**: pointer to a style

void **lv\_mbox\_set\_recolor**(*lv\_obj\_t* \*mbox, bool en)  
Set whether recoloring is enabled. Must be called after **lv\_mbox\_add\_btns**.

#### Parameters

- **btnm**: pointer to button matrix object
- **en**: whether recoloring is enabled

const char \***lv\_mbox\_get\_text**(const *lv\_obj\_t* \*mbox)  
Get the text of the message box

**Return** pointer to the text of the message box

#### Parameters

- **mbox**: pointer to a message box object

uint16\_t **lv\_mbox\_get\_active\_btn**(*lv\_obj\_t* \*mbox)  
Get the index of the lastly “activated” button by the user (pressed, released etc) Useful in the the **event\_cb**.

**Return** index of the last released button (LV\_BTNM\_BTN\_NONE: if unset)

#### Parameters

- **btnm**: pointer to button matrix object

**const** char \***lv\_mbox\_get\_active\_btn\_text**(*lv\_obj\_t \*mbox*)

Get the text of the lastly “activated” button by the user (pressed, released etc) Useful in the the event\_cb.

**Return** text of the last released button (NULL: if unset)

**Parameters**

- **btnm**: pointer to button matrix object

uint16\_t **lv\_mbox\_get\_anim\_time**(**const** *lv\_obj\_t \*mbox*)

Get the animation duration (close animation time)

**Return** animation length in milliseconds (0: no animation)

**Parameters**

- **mbox**: pointer to a message box object

**const** lv\_style\_t \***lv\_mbox\_get\_style**(**const** *lv\_obj\_t \*mbox*, *lv\_mbox\_style\_t type*)

Get a style of a message box

**Return** style pointer to a style

**Parameters**

- **mbox**: pointer to a message box object
- **type**: which style should be get

bool **lv\_mbox\_get\_recolor**(**const** *lv\_obj\_t \*mbox*)

Get whether recoloring is enabled

**Return** whether recoloring is enabled

**Parameters**

- **mbox**: pointer to a message box object

*lv\_obj\_t \****lv\_mbox\_get\_btnm**(*lv\_obj\_t \*mbox*)

Get message box button matrix

**Return** pointer to button matrix object

**Remark** return value will be NULL unless **lv\_mbox\_add\_btns** has been already called

**Parameters**

- **mbox**: pointer to a message box object

**struct lv\_mbox\_ext\_t**

**Public Members**

*lv\_cont\_ext\_t* **bg**

*lv\_obj\_t \****text**

*lv\_obj\_t \****btnm**

uint16\_t **anim\_time**

## Page (lv\_page)

### Vue d' ensemble

La page se compose de deux *conteneurs* l' un sur l' autre :

- un **arrière-plan** (ou base)
- un plan supérieur **pouvant défiler**.

L' objet d' arrière-plan peut être référencé comme la page elle-même : `lv_obj_set_width(page, 100)`.

Si vous créez un enfant sur la page, celui-ci sera automatiquement déplacé vers le conteneur pouvant défiler. Si le conteneur pouvant défiler devient plus grand que l' arrière-plan, vous pouvez le faire \*défiler en le faisant glisser (comme dans les listes sur les smartphones).

By default, the scrollable' s has `LV_FIT_FILL` auto fit in all directions. It means the scrollable size will be the same as the background' s size (minus the paddings) while the children are in the background. But when an object is positioned out of the background the scrollable size will be increased to involve it.

### Barres de défilement

Les barres de défilement peuvent être affichées selon quatre stratégies :

- **LV\_SB\_MODE\_OFF** les barres de défilement ne sont jamais affichées
- **LV\_SB\_MODE\_ON** les barres de défilement sont toujours affichées
- **LV\_SB\_MODE\_DRAG** les barres de défilement sont affichées quand la page est tirée
- **LV\_SB\_MODE\_AUTO** affiche les barres de défilement quand le conteneur est suffisamment grand pour être défilé

Vous pouvez définir la politique d' affichage de la barre de défilement avec : `lv_page_set_sb_mode(page, SB_MODE)`. La valeur par défaut est `LV_SB_MODE_AUTO`.

### Objet collé

Vous pouvez coller des enfants à la page. Dans ce cas, vous pouvez faire défiler la page en faisant glisser l' objet enfant. It can be enabled by the `lv_page_glue_obj(child, true)`.

### Focus object

You can focus on an object on a page with `lv_page_focus(page, child, LV_ANIM_ON/OFF)`. It will move the scrollable container to show a child. The time of the animation can be set by `lv_page_set_anim_time(page, anim_time)` in milliseconds.

### Manual navigation

You can move the scrollable object manually using `lv_page_scroll_hor(page, dist)` and `lv_page_scroll_ver(page, dist)`

## Edge flash

A circle-like effect can be shown if the list reached the most top/bottom/left/right position. `lv_page_set_edge_flash(list, en)` enables this feature.

## Scroll propagation

If the list is created on an other scrollable element (like an other page) and the Page can't be scrolled further the scrolling can be propagated to the parent to continue the scrolling on the parent. It can be enabled with `lv_page_set_scroll_propagation(list, true)`

## Scrollable API

There are functions to directly set/get the scrollable's attributes:

- `lv_page_get_scr1()`
- `lv_page_set_scr1_fit/fint2/fit4()`
- `lv_page_set_scr1_width()`
- `lv_page_set_scr1_height()`
- `lv_page_set_scr1_layout()`

## Notes

The background draws its border when the scrollable is drawn. It ensures that the page always will have a closed shape even if the scrollable has the same color as the Page's parent.

## Styles

Use `lv_page_set_style(page, LV_PAGE_STYLE_..., &style)` to set a new style for an element of the page:

- **LV\_PAGE\_STYLE\_BG** background's style which uses all `style.body` properties (default: `lv_style_pretty_color`)
- **LV\_PAGE\_STYLE\_SCRL** scrollable's style which uses all `style.body` properties (default: `lv_style_pretty`)
- **LV\_PAGE\_STYLE\_SB** scrollbar's style which uses all `style.body` properties. `padding.right/bottom` sets horizontal and vertical the scrollbars' padding respectively and the `padding.inner` sets the scrollbar's width. (default: `lv_style_pretty_color`)

## Events

Only the [Generic events](#) are sent by the object type.

The scrollable object has a default event callback which propagates the following events to the background object: `LV_EVENT_PRESSED`, `LV_EVENT_PRESSING`, `LV_EVENT_PRESS_LOST`, `LV_EVENT_RELEASED`, `LV_EVENT_SHORT_CLICKED`, `LV_EVENT_CLICKED`, `LV_EVENT_LONG_PRESSED`, `LV_EVENT_LONG_PRESSED_REPEAT`

Learn more about [Events](#).

## ##Keys

The following *Keys* are processed by the Page:

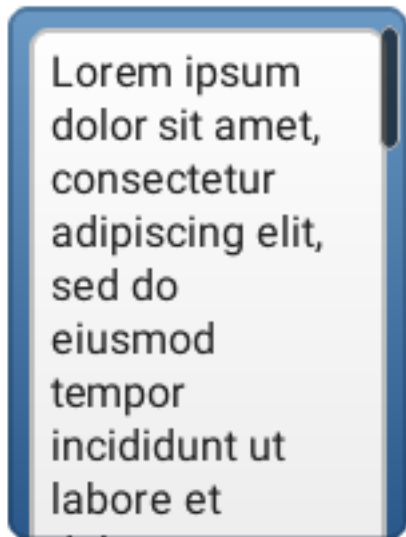
- **LV\_KEY\_RIGHT/LEFT/UP/DOWN** Scroll the page

Learn more about [Keys](#).

## Example

### C

#### Page with scrollbar



code

```
#include "lvgl/lvgl.h"

void lv_ex_page_1(void)
{
    /*Create a scroll bar style*/
    static lv_style_t style_sb;
    lv_style_copy(&style_sb, &lv_style_plain);
    style_sb.body.main_color = LV_COLOR_BLACK;
    style_sb.body.grad_color = LV_COLOR_BLACK;
    style_sb.body.border.color = LV_COLOR_WHITE;
    style_sb.body.border.width = 1;
    style_sb.body.border.opa = LV_OPA_70;
    style_sb.body.radius = LV_RADIUS_CIRCLE;
    style_sb.body.opa = LV_OPA_60;
    style_sb.body.padding.right = 3;
    style_sb.body.padding.bottom = 3;
}
```

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```

style_sb.body.padding.inner = 8;          /*Scrollbar width*/

/*Create a page*/
lv_obj_t * page = lv_page_create(lv_scr_act(), NULL);
lv_obj_set_size(page, 150, 200);
lv_obj_align(page, NULL, LV_ALIGN_CENTER, 0, 0);
lv_page_set_style(page, LV_PAGE_STYLE_SB, &style_sb);          /*Set the
↪ scrollbar style*/

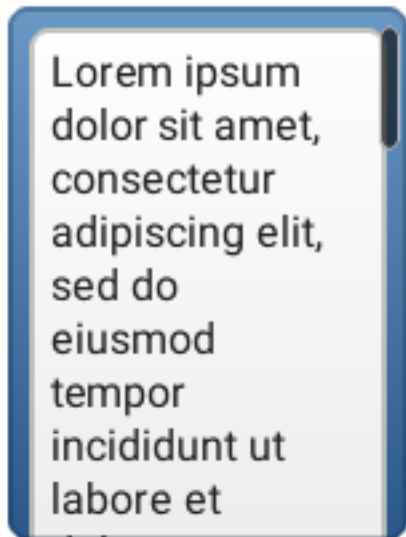
/*Create a label on the page*/
lv_obj_t * label = lv_label_create(page, NULL);
lv_label_set_long_mode(label, LV_LABEL_LONG_BREAK);          /*Automatically
↪ break long lines*/
lv_obj_set_width(label, lv_page_get_fit_width(page));          /*Set the label
↪ width to max value to not show hor. scroll bars*/
lv_label_set_text(label, "Lorem ipsum dolor sit amet, consectetur adipiscing elit,
↪ \n"
                                "sed do eiusmod tempor incididunt ut labore et dolore
↪ magna aliqua.\n"
                                "Ut enim ad minim veniam, quis nostrud exercitation
↪ ullamco\n"
                                "laboris nisi ut aliquip ex ea commodo consequat. Duis
↪ aute irure\n"
                                "dolor in reprehenderit in voluptate velit esse cillum
↪ dolore\n"
                                "eu fugiat nulla pariat.\n"
                                "Excepteur sint occaecat cupidatat non proident, sunt in
↪ culpa\n"
                                "qui officia deserunt mollit anim id est laborum.");
}

```

## MicroPython



## Page with scrollbar



code

```
# Create a scroll bar style
style_sb = lv.style_t()
lv.style_copy(style_sb, lv.style_plain)
style_sb.body.main_color = lv.color_make(0,0,0)
style_sb.body.grad_color = lv.color_make(0,0,0)
style_sb.body.border.color = lv.color_make(0xff,0xff,0xff)
style_sb.body.border.width = 1
style_sb.body.border.opa = lv.OPA_70
style_sb.body.radius = 800 # large enough to make a circle
style_sb.body.opa = lv.OPA_60
style_sb.body.padding.right = 3
style_sb.body.padding.bottom = 3
style_sb.body.padding.inner = 8 # Scrollbar width

# Create a page
page = lv.page(lv.scr_act())
page.set_size(150, 200)
page.align(None, lv.ALIGN.CENTER, 0, 0)
page.set_style(lv.page.STYLE.SB, style_sb) # Set the scrollbar style

# Create a label on the page
label = lv.label(page)
label.set_long_mode(lv.label.LONG.BREAK) # Automatically break long lines
label.set_width(page.get_fit_width()) # Set the label width to max value to
↳ not show hor. scroll bars
label.set_text("""Lorem ipsum dolor sit amet, consectetur adipiscing elit,
sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.
Ut enim ad minim veniam, quis nostrud exercitation ullamco
laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure
dolor in reprehenderit in voluptate velit esse cillum dolore
eu fugiat nulla pariatur.
```

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```
Excepteur sint occaecat cupidatat non proident, sunt in culpa
qui officia deserunt mollit anim id est laborum."""
```

## API

### Typedefs

```
typedef uint8_t lv_sb_mode_t
typedef uint8_t lv_page_edge_t
typedef uint8_t lv_page_style_t
```

### Enums

```
enum [anonymous]
    Scrollbar modes: shows when should the scrollbars be visible
    Values:
    LV_SB_MODE_OFF = 0x0
        Never show scrollbars
    LV_SB_MODE_ON = 0x1
        Always show scrollbars
    LV_SB_MODE_DRAG = 0x2
        Show scrollbars when page is being dragged
    LV_SB_MODE_AUTO = 0x3
        Show scrollbars when the scrollable container is large enough to be scrolled
    LV_SB_MODE_HIDE = 0x4
        Hide the scroll bar temporally
    LV_SB_MODE_UNHIDE = 0x5
        Unhide the previously hidden scrollbar. Recover it' s type too

enum [anonymous]
    Edges: describes the four edges of the page
    Values:
    LV_PAGE_EDGE_LEFT = 0x1
    LV_PAGE_EDGE_TOP = 0x2
    LV_PAGE_EDGE_RIGHT = 0x4
    LV_PAGE_EDGE_BOTTOM = 0x8

enum [anonymous]
    Values:
    LV_PAGE_STYLE_BG
    LV_PAGE_STYLE_SCROLL
    LV_PAGE_STYLE_SB
    LV_PAGE_STYLE_EDGE_FLASH
```

## Functions

*lv\_obj\_t* \***lv\_page\_create**(*lv\_obj\_t* \**par*, **const** *lv\_obj\_t* \**copy*)

Create a page objects

**Return** pointer to the created page

### Parameters

- **par**: pointer to an object, it will be the parent of the new page
- **copy**: pointer to a page object, if not NULL then the new object will be copied from it

**void** **lv\_page\_clean**(*lv\_obj\_t* \**page*)

Delete all children of the scr1 object, without deleting scr1 child.

### Parameters

- **page**: pointer to an object

*lv\_obj\_t* \***lv\_page\_get\_scr1**(**const** *lv\_obj\_t* \**page*)

Get the scrollable object of a page

**Return** pointer to a container which is the scrollable part of the page

### Parameters

- **page**: pointer to a page object

**uint16\_t** **lv\_page\_get\_anim\_time**(**const** *lv\_obj\_t* \**page*)

Get the animation time

**Return** the animation time in milliseconds

### Parameters

- **page**: pointer to a page object

**void** **lv\_page\_set\_sb\_mode**(*lv\_obj\_t* \**page*, *lv\_sb\_mode\_t* *sb\_mode*)

Set the scroll bar mode on a page

### Parameters

- **page**: pointer to a page object
- **sb\_mode**: the new mode from 'lv\_page\_sb.mode\_t' enum

**void** **lv\_page\_set\_anim\_time**(*lv\_obj\_t* \**page*, **uint16\_t** *anim\_time*)

Set the animation time for the page

### Parameters

- **page**: pointer to a page object
- **anim\_time**: animation time in milliseconds

**void** **lv\_page\_set\_scroll\_propagation**(*lv\_obj\_t* \**page*, **bool** *en*)

Enable the scroll propagation feature. If enabled then the page will move its parent if there is no more space to scroll.

### Parameters

- **page**: pointer to a Page
- **en**: true or false to enable/disable scroll propagation

**void** **lv\_page\_set\_edge\_flash**(*lv\_obj\_t* \**page*, **bool** *en*)

Enable the edge flash effect. (Show an arc when the an edge is reached)

#### Parameters

- **page**: pointer to a Page
- **en**: true or false to enable/disable end flash

**static void lv\_page\_set\_scr\_fit4**(*lv\_obj\_t \*page, lv\_fit\_t left, lv\_fit\_t right, lv\_fit\_t top, lv\_fit\_t bottom*)

Set the fit policy in all 4 directions separately. It tell how to change the page size automatically.

#### Parameters

- **page**: pointer to a page object
- **left**: left fit policy from `lv_fit_t`
- **right**: right fit policy from `lv_fit_t`
- **top**: bottom fit policy from `lv_fit_t`
- **bottom**: bottom fit policy from `lv_fit_t`

**static void lv\_page\_set\_scr\_fit2**(*lv\_obj\_t \*page, lv\_fit\_t hor, lv\_fit\_t ver*)

Set the fit policy horizontally and vertically separately. It tell how to change the page size automatically.

#### Parameters

- **page**: pointer to a page object
- **hor**: horizontal fit policy from `lv_fit_t`
- **ver**: vertical fit policy from `lv_fit_t`

**static void lv\_page\_set\_scr\_fit**(*lv\_obj\_t \*page, lv\_fit\_t fit*)

Set the fit policy in all 4 direction at once. It tell how to change the page size automatically.

#### Parameters

- **page**: pointer to a button object
- **fit**: fit policy from `lv_fit_t`

**static void lv\_page\_set\_scr\_width**(*lv\_obj\_t \*page, lv\_coord\_t w*)

Set width of the scrollable part of a page

#### Parameters

- **page**: pointer to a page object
- **w**: the new width of the scrollable (it ha no effect is horizontal fit is enabled)

**static void lv\_page\_set\_scr\_height**(*lv\_obj\_t \*page, lv\_coord\_t h*)

Set height of the scrollable part of a page

#### Parameters

- **page**: pointer to a page object
- **h**: the new height of the scrollable (it ha no effect is vertical fit is enabled)

**static void lv\_page\_set\_scr\_layout**(*lv\_obj\_t \*page, lv\_layout\_t layout*)

Set the layout of the scrollable part of the page

#### Parameters

- **page**: pointer to a page object
- **layout**: a layout from `'lv_cont_layout_t'`

void **lv\_page\_set\_style**(*lv\_obj\_t* \*page, *lv\_page\_style\_t* type, const *lv\_style\_t* \*style)  
Set a style of a page

**Parameters**

- **page**: pointer to a page object
- **type**: which style should be set
- **style**: pointer to a style

*lv\_sb\_mode\_t* **lv\_page\_get\_sb\_mode**(const *lv\_obj\_t* \*page)  
Set the scroll bar mode on a page

**Return** the mode from 'lv\_page\_sb.mode\_t' enum

**Parameters**

- **page**: pointer to a page object

bool **lv\_page\_get\_scroll\_propagation**(*lv\_obj\_t* \*page)  
Get the scroll propagation property

**Return** true or false

**Parameters**

- **page**: pointer to a Page

bool **lv\_page\_get\_edge\_flash**(*lv\_obj\_t* \*page)  
Get the edge flash effect property.

**Parameters**

- **page**: pointer to a Page return true or false

*lv\_coord\_t* **lv\_page\_get\_fit\_width**(*lv\_obj\_t* \*page)  
Get that width which can be set to the children to still not cause overflow (show scrollbars)

**Return** the width which still fits into the page

**Parameters**

- **page**: pointer to a page object

*lv\_coord\_t* **lv\_page\_get\_fit\_height**(*lv\_obj\_t* \*page)  
Get that height which can be set to the children to still not cause overflow (show scrollbars)

**Return** the height which still fits into the page

**Parameters**

- **page**: pointer to a page object

static *lv\_coord\_t* **lv\_page\_get\_scrl\_width**(const *lv\_obj\_t* \*page)  
Get width of the scrollable part of a page

**Return** the width of the scrollable

**Parameters**

- **page**: pointer to a page object

static *lv\_coord\_t* **lv\_page\_get\_scrl\_height**(const *lv\_obj\_t* \*page)  
Get height of the scrollable part of a page

**Return** the height of the scrollable

**Parameters**

- **page**: pointer to a page object

**static** *lv\_layout\_t* **lv\_page\_get\_scr\_layout**(const *lv\_obj\_t* \*page)

Get the layout of the scrollable part of a page

**Return** the layout from 'lv\_cont\_layout\_t'

**Parameters**

- **page**: pointer to page object

**static** *lv\_fit\_t* **lv\_page\_get\_scr\_fit\_left**(const *lv\_obj\_t* \*page)

Get the left fit mode

**Return** an element of *lv\_fit\_t*

**Parameters**

- **page**: pointer to a page object

**static** *lv\_fit\_t* **lv\_page\_get\_scr\_fit\_right**(const *lv\_obj\_t* \*page)

Get the right fit mode

**Return** an element of *lv\_fit\_t*

**Parameters**

- **page**: pointer to a page object

**static** *lv\_fit\_t* **lv\_page\_get\_scr\_fit\_top**(const *lv\_obj\_t* \*page)

Get the top fit mode

**Return** an element of *lv\_fit\_t*

**Parameters**

- **page**: pointer to a page object

**static** *lv\_fit\_t* **lv\_page\_get\_scr\_fit\_bottom**(const *lv\_obj\_t* \*page)

Get the bottom fit mode

**Return** an element of *lv\_fit\_t*

**Parameters**

- **page**: pointer to a page object

**const** *lv\_style\_t* \***lv\_page\_get\_style**(const *lv\_obj\_t* \*page, *lv\_page\_style\_t* type)

Get a style of a page

**Return** style pointer to a style

**Parameters**

- **page**: pointer to page object
- **type**: which style should be get

bool **lv\_page\_on\_edge**(*lv\_obj\_t* \*page, *lv\_page\_edge\_t* edge)

Find whether the page has been scrolled to a certain edge.

**Return** true if the page is on the specified edge

**Parameters**

- **page**: Page object
- **edge**: Edge to check

void **lv\_page\_glue\_obj**(*lv\_obj\_t* \*obj, bool glue)  
 Glue the object to the page. After it the page can be moved (dragged) with this object too.

**Parameters**

- **obj**: pointer to an object on a page
- **glue**: true: enable glue, false: disable glue

void **lv\_page\_focus**(*lv\_obj\_t* \*page, const *lv\_obj\_t* \*obj, *lv\_anim\_enable\_t* anim\_en)  
 Focus on an object. It ensures that the object will be visible on the page.

**Parameters**

- **page**: pointer to a page object
- **obj**: pointer to an object to focus (must be on the page)
- **anim\_en**: LV\_ANIM\_ON to focus with animation; LV\_ANIM\_OFF to focus without animation

void **lv\_page\_scroll\_hor**(*lv\_obj\_t* \*page, lv\_coord\_t dist)  
 Scroll the page horizontally

**Parameters**

- **page**: pointer to a page object
- **dist**: the distance to scroll (< 0: scroll left; > 0 scroll right)

void **lv\_page\_scroll\_ver**(*lv\_obj\_t* \*page, lv\_coord\_t dist)  
 Scroll the page vertically

**Parameters**

- **page**: pointer to a page object
- **dist**: the distance to scroll (< 0: scroll down; > 0 scroll up)

void **lv\_page\_start\_edge\_flash**(*lv\_obj\_t* \*page)  
 Not intended to use directly by the user but by other object types internally. Start an edge flash animation. Exactly one `ext->edge_flash.xxx_ip` should be set

**Parameters**

- **page**:

**struct lv\_page\_ext\_t**

**Public Members**

*lv\_cont\_ext\_t* **bg**

*lv\_obj\_t* \***scr1**

const *lv\_style\_t* \***style**

*lv\_area\_t* **hor\_area**

*lv\_area\_t* **ver\_area**

uint8\_t **hor\_draw**

uint8\_t **ver\_draw**

*lv\_sb\_mode\_t* **mode**

```

struct lv_page_ext_t::[anonymous] sb
lv_anim_value_t state
uint8_t enabled
uint8_t top_ip
uint8_t bottom_ip
uint8_t right_ip
uint8_t left_ip
struct lv_page_ext_t::[anonymous] edge_flash
uint16_t anim_time
uint8_t scroll_prop
uint8_t scroll_prop_ip

```

### Indicateur de chargement (lv\_preload)

#### Vue d' ensemble

L' objet indicateur de chargement est un arc en rotation sur une bordure circulaire.

###Longueur de l' arc La longueur de l' arc peut être ajustée par `lv_preload_set_arc_length(preload, deg)`.

#### Vitesse de rotation

La vitesse de rotation peut être ajustée par `lv_preload_set_spin_time(preload, time_ms)`.

#### Types de rotation

Vous pouvez choisir parmi plusieurs types de rotation :

- **LV\_PRELOAD\_TYPE\_SPINNING\_ARC** rotation de l' arc avec ralentissement au sommet du cercle
- **LV\_PRELOAD\_TYPE\_FILLSPIN\_ARC** rotation de l' arc avec ralentissement au sommet du cercle mais étire également l' arc

Pour appliquer un type, utilisez `lv_preload_set_type(preload, LV_PRELOAD_TYPE_...)`

#### Direction de rotation

Le sens de rotation peut être changé avec `lv_preload_set_dir(preload, LV_PRELOAD_DIR_FORWARD/BACKWARD)`.



## Styles

Vous pouvez définir les styles avec `lv_preload_set_style(btn, LV_PRELOAD_STYLE_MAIN, &style)`. Il décrit à la fois le style de l' arc et celui de la bordure :

- **arc** est décrit par les propriétés `line`
- **border** est décrit par les propriétés `body.border` notamment `body.padding.left/top` pour donner un rayon plus petit à la bordure (le plus petit est utilisé).

## Événements

Seuls les [événements génériques](#) sont envoyés par ce type d' objet.

## Touches

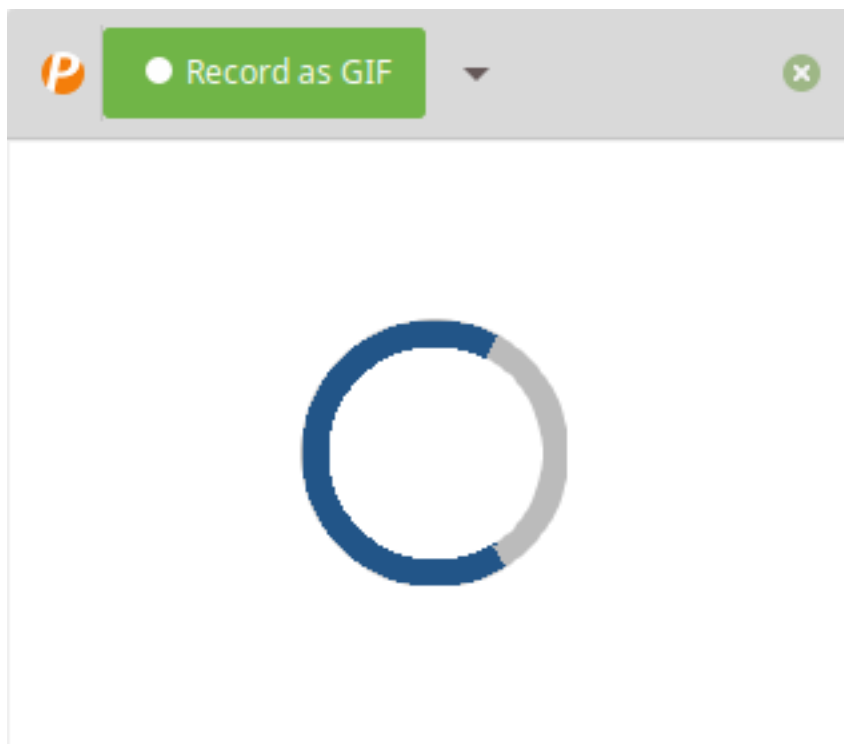
Aucune *touche* n' est traitée par ce type d' objet.

Apprenez-en plus sur les [touches](#).

## Exemple

### C

#### Preloader with custom style



code

```
#include "lvgl/lvgl.h"

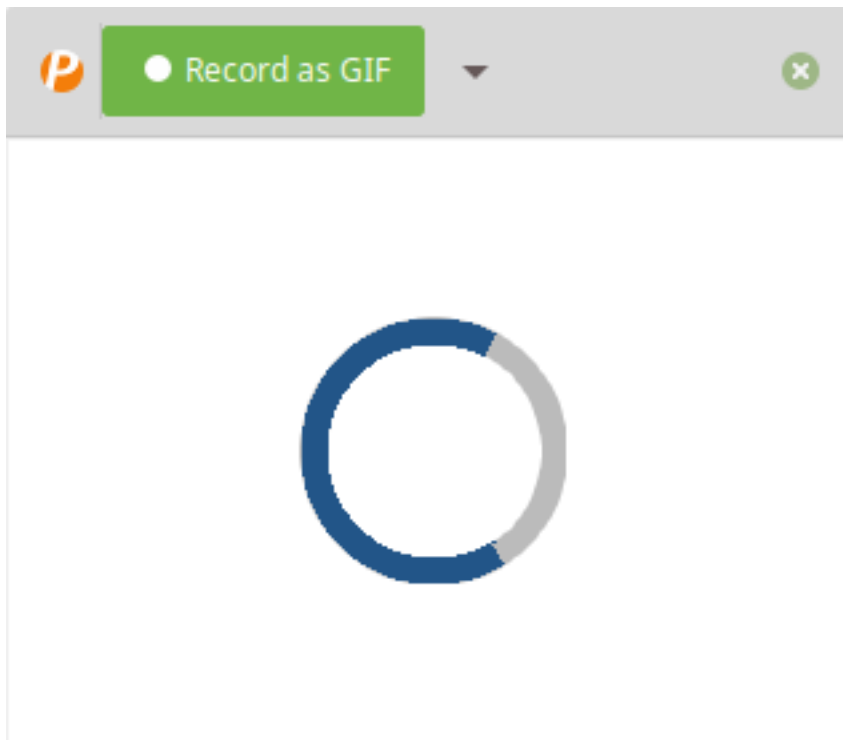
void lv_ex_preload_1(void)
{
    /*Create a style for the Preloader*/
    static lv_style_t style;
    lv_style_copy(&style, &lv_style_plain);
    style.line.width = 10; /*10 px thick arc*/
    style.line.color = lv_color_hex3(0x258); /*Blueish arc color*/

    style.body.border.color = lv_color_hex3(0xBBB); /*Gray background color*/
    style.body.border.width = 10;
    style.body.padding.left = 0;

    /*Create a Preloader object*/
    lv_obj_t * preload = lv_preload_create(lv_scr_act(), NULL);
    lv_obj_set_size(preload, 100, 100);
    lv_obj_align(preload, NULL, LV_ALIGN_CENTER, 0, 0);
    lv_preload_set_style(preload, LV_PRELOAD_STYLE_MAIN, &style);
}
```

## MicroPython

### Preloader with custom style



code

```
# Create a style for the Preloader
style = lv.style_t()
```

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```
lv.style_copy(style, lv.style_plain)
style.line.width = 10                # 10 px thick arc
style.line.color = lv.color_hex3(0x258) # Blueish arc color

style.body.border.color = lv.color_hex3(0xBBB) # Gray background color
style.body.border.width = 10
style.body.padding.left = 0

# Create a Preloader object
preload = lv.preload(lv.scr_act())
preload.set_size(100, 100)
preload.align(None, lv.ALIGN.CENTER, 0, 0)
preload.set_style(lv.preload.STYLE.MAIN, style)
```

## MicroPython

Pas encore d' exemple.

## API

### Typedefs

```
typedef uint8_t lv_preload_type_t
typedef uint8_t lv_preload_dir_t
typedef uint8_t lv_preload_style_t
```

### Enums

```
enum [anonymous]
    Type of preloader.

    Values:

    LV_PRELOAD_TYPE_SPINNING_ARC
    LV_PRELOAD_TYPE_FILLSPIN_ARC
    LV_PRELOAD_TYPE_CONSTANT_ARC

enum [anonymous]
    Direction the preloader should spin.

    Values:

    LV_PRELOAD_DIR_FORWARD
    LV_PRELOAD_DIR_BACKWARD

enum [anonymous]
    Values:

    LV_PRELOAD_STYLE_MAIN
```

## Functions

*lv\_obj\_t* \***lv\_preload\_create**(*lv\_obj\_t* \*par, **const** *lv\_obj\_t* \*copy)

Create a pre loader objects

**Return** pointer to the created pre loader

### Parameters

- **par**: pointer to an object, it will be the parent of the new pre loader
- **copy**: pointer to a pre loader object, if not NULL then the new object will be copied from it

void **lv\_preload\_set\_arc\_length**(*lv\_obj\_t* \*preload, *lv\_anim\_value\_t* deg)

Set the length of the spinning arc in degrees

### Parameters

- **preload**: pointer to a preload object
- **deg**: length of the arc

void **lv\_preload\_set\_spin\_time**(*lv\_obj\_t* \*preload, uint16\_t time)

Set the spin time of the arc

### Parameters

- **preload**: pointer to a preload object
- **time**: time of one round in milliseconds

void **lv\_preload\_set\_style**(*lv\_obj\_t* \*preload, *lv\_preload\_style\_t* type, **const** *lv\_style\_t* \*style)

Set a style of a pre loader.

### Parameters

- **preload**: pointer to pre loader object
- **type**: which style should be set
- **style**: pointer to a style

void **lv\_preload\_set\_type**(*lv\_obj\_t* \*preload, *lv\_preload\_type\_t* type)

Set the animation type of a preloader.

### Parameters

- **preload**: pointer to pre loader object
- **type**: animation type of the preload

void **lv\_preload\_set\_dir**(*lv\_obj\_t* \*preload, *lv\_preload\_dir\_t* dir)

Set the animation direction of a preloader

### Parameters

- **preload**: pointer to pre loader object
- **direction**: animation direction of the preload

*lv\_anim\_value\_t* **lv\_preload\_get\_arc\_length**(**const** *lv\_obj\_t* \*preload)

Get the arc length [degree] of the a pre loader

### Parameters

- **preload**: pointer to a pre loader object

uint16\_t **lv\_preload\_get\_spin\_time**(const lv\_obj\_t \*preload)

Get the spin time of the arc

**Parameters**

- **preload**: pointer to a pre loader object [milliseconds]

const lv\_style\_t \***lv\_preload\_get\_style**(const lv\_obj\_t \*preload, lv\_preload\_style\_t type)

Get style of a pre loader.

**Return** style pointer to the style

**Parameters**

- **preload**: pointer to pre loader object
- **type**: which style should be get

lv\_preload\_type\_t **lv\_preload\_get\_type**(lv\_obj\_t \*preload)

Get the animation type of a preloader.

**Return** animation type

**Parameters**

- **preload**: pointer to pre loader object

lv\_preload\_dir\_t **lv\_preload\_get\_dir**(lv\_obj\_t \*preload)

Get the animation direction of a preloader

**Return** animation direction

**Parameters**

- **preload**: pointer to pre loader object

void **lv\_preload\_spinner\_anim**(void \*ptr, lv\_anim\_value\_t val)

Animator function (exec\_cb) to rotate the arc of spinner.

**Parameters**

- **ptr**: pointer to preloader
- **val**: the current desired value [0..360]

**struct lv\_preload\_ext\_t**

**Public Members**

lv\_arc\_ext\_t **arc**

lv\_anim\_value\_t **arc\_length**

uint16\_t **time**

lv\_preload\_type\_t **anim\_type**

lv\_preload\_dir\_t **anim\_dir**

**Roller (lv\_roller)**

## Overview

Roller allows you to simply select one option from more with scrolling. Its functionalities are similar to *Drop down list*.

## Set options

The options are passed to the Roller as a string with `lv_roller_set_options(roller, options, LV_ROLLER_MODE_NORMAL/INFINITE)`. The options should be separated by `\n`. For example: `"First\nSecond\nThird"`.

`LV_ROLLER_MODE_INIFINITE` make the roller circular.

You can select an option manually with `lv_roller_set_selected(roller, id)`, where *id* is the index of an option.

## Get selected option

To get the currently selected option use `lv_roller_get_selected(roller)` it will return the *index* of the selected option.

`lv_roller_get_selected_str(roller, buf, buf_size)` copy the name of the selected option to *buf*.

## Align the options

To align the label horizontally use `lv_roller_set_align(roller, LV_LABEL_ALIGN_LEFT/CENTER/RIGHT)`.

## Height and width

You can set the number of visible rows with `lv_roller_set_visible_row_count(roller, num)`

The width is adjusted automatically according to the width of the options. To prevent this apply `lv_roller_set_fix_width(roller, width)`. 0 means to use auto width.

## Animation time

When the Roller is scrolled and doesn't stop exactly on an option it will scroll to the nearest valid option automatically. The time of this scroll animation can be changed by `lv_roller_set_anim_time(roller, anim_time)`. Zero animation time means no animation.

## Styles

The `lv_roller_set_style(roller, LV_ROLLER_STYLE_..., &style)` set the styles of a Roller.

- **LV\_ROLLER\_STYLE\_BG** Style of the background. All `style.body` properties are used. `style.text` is used for the option's label. Default: `lv_style_pretty`
- **LV\_ROLLER\_STYLE\_SEL** Style of the selected option. The `style.body` properties are used. The selected option will be recolored with `text.color`. Default: `lv_style_plain_color`

## Events

Besides, the [Generic events](#) the following [Special events](#) are sent by the Drop down lists:

- **LV\_EVENT\_VALUE\_CHANGED** sent when a new option is selected

Learn more about [Events](#).

## Keys

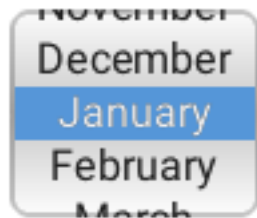
The following *Keys* are processed by the Buttons:

- **LV\_KEY\_RIGHT/DOWN** Select the next option
- **LV\_KEY\_LEFT/UP** Select the previous option
- **LV\_KEY\_ENTER** Apply the selected option (Send **LV\_EVENT\_VALUE\_CHANGED** event)

## Example

### C

#### Simple Roller



code

```
#include "lvgl/lvgl.h"
#include <stdio.h>

static void event_handler(lv_obj_t * obj, lv_event_t event)
{
    if(event == LV_EVENT_VALUE_CHANGED) {
```

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```

    char buf[32];
    lv_roller_get_selected_str(obj, buf, sizeof(buf));
    printf("Selected month: %s\n", buf);
}

void lv_ex_roller_1(void)
{
    lv_obj_t *roller1 = lv_roller_create(lv_scr_act(), NULL);
    lv_roller_set_options(roller1,
        "January\n"
        "February\n"
        "March\n"
        "April\n"
        "May\n"
        "June\n"
        "July\n"
        "August\n"
        "September\n"
        "October\n"
        "November\n"
        "December",
        LV_ROLLER_MODE_INIFINITE);

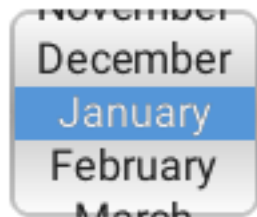
    lv_roller_set_visible_row_count(roller1, 4);
    lv_obj_align(roller1, NULL, LV_ALIGN_CENTER, 0, 0);
    lv_obj_set_event_cb(roller1, event_handler);
}

```

## MicroPython



## Simple Roller



code

```
def event_handler(obj, event):
    if event == lv.EVENT.VALUE_CHANGED:
        option = " "*10
        obj.get_selected_str(option, len(option))
        print("Selected month: %s" % option.strip())

roller1 = lv.roller(lv.scr_act())
roller1.set_options("\n".join([
    "January",
    "February",
    "March",
    "April",
    "May",
    "June",
    "July",
    "August",
    "September",
    "October",
    "November",
    "December"]), lv.roller.MODE.INIFINITE)

roller1.set_visible_row_count(4)
roller1.align(None, lv.ALIGN.CENTER, 0, 0)
roller1.set_event_cb(event_handler)
```

## API

## Typedefs

```
typedef uint8_t lv_roller_mode_t
typedef uint8_t lv_roller_style_t
```

## Enums

```
enum [anonymous]
    Roller mode.

    Values:

    LV_ROLLER_MODE_NORMAL
        Normal mode (roller ends at the end of the options).

    LV_ROLLER_MODE_INIFINITE
        Infinite mode (roller can be scrolled forever).

enum [anonymous]
    Values:

    LV_ROLLER_STYLE_BG
    LV_ROLLER_STYLE_SEL
```

## Functions

```
lv_obj_t *lv_roller_create(lv_obj_t *par, const lv_obj_t *copy)
    Create a roller object
```

**Return** pointer to the created roller

### Parameters

- **par**: pointer to an object, it will be the parent of the new roller
- **copy**: pointer to a roller object, if not NULL then the new object will be copied from it

```
void lv_roller_set_options(lv_obj_t *roller, const char *options, lv_roller_mode_t mode)
    Set the options on a roller
```

### Parameters

- **roller**: pointer to roller object
- **options**: a string with " separated options. E.g. "One\nTwo\nThree"
- **mode**: LV\_ROLLER\_MODE\_NORMAL or LV\_ROLLER\_MODE\_INIFINITE

```
void lv_roller_set_align(lv_obj_t *roller, lv_label_align_t align)
    Set the align of the roller's options (left, right or center[default])
```

### Parameters

- **roller**: - pointer to a roller object
- **align**: - one of lv\_label\_align\_t values (left, right, center)

```
void lv_roller_set_selected(lv_obj_t *roller, uint16_t sel_opt, lv_anim_enable_t anim)
    Set the selected option
```

### Parameters

- **roller**: pointer to a roller object
- **sel\_opt**: id of the selected option (0 ...number of option - 1);
- **anim**: LV\_ANOM\_ON: set with animation; LV\_ANIM\_OFF set immediately

void **lv\_roller\_set\_visible\_row\_count**(*lv\_obj\_t* \*roller, uint8\_t row\_cnt)

Set the height to show the given number of rows (options)

#### Parameters

- **roller**: pointer to a roller object
- **row\_cnt**: number of desired visible rows

**static** void **lv\_roller\_set\_fix\_width**(*lv\_obj\_t* \*roller, lv\_coord\_t w)

Set a fix width for the drop down list

#### Parameters

- **roller**: pointer to a roller object
- **w**: the width when the list is opened (0: auto size)

**static** void **lv\_roller\_set\_anim\_time**(*lv\_obj\_t* \*roller, uint16\_t anim\_time)

Set the open/close animation time.

#### Parameters

- **roller**: pointer to a roller object
- **anim\_time**: open/close animation time [ms]

void **lv\_roller\_set\_style**(*lv\_obj\_t* \*roller, *lv\_roller\_style\_t* type, **const** lv\_style\_t \*style)

Set a style of a roller

#### Parameters

- **roller**: pointer to a roller object
- **type**: which style should be set
- **style**: pointer to a style

uint16\_t **lv\_roller\_get\_selected**(**const** *lv\_obj\_t* \*roller)

Get the id of the selected option

**Return** id of the selected option (0 ...number of option - 1);

#### Parameters

- **roller**: pointer to a roller object

**static** void **lv\_roller\_get\_selected\_str**(**const** *lv\_obj\_t* \*roller, char \*buf, uint16\_t buf\_size)

Get the current selected option as a string

#### Parameters

- **roller**: pointer to roller object
- **buf**: pointer to an array to store the string
- **buf\_size**: size of buf in bytes. 0: to ignore it.

*lv\_label\_align\_t* **lv\_roller\_get\_align**(**const** *lv\_obj\_t* \*roller)

Get the align attribute. Default alignment after \_create is LV\_LABEL\_ALIGN\_CENTER

**Return** LV\_LABEL\_ALIGN\_LEFT, LV\_LABEL\_ALIGN\_RIGHT or  
LV\_LABEL\_ALIGN\_CENTER

#### Parameters

- **roller**: pointer to a roller object

**static const** char \***lv\_roller\_get\_options**(const *lv\_obj\_t* \*roller)

Get the options of a roller

**Return** the options separated by " -s (E.g. "Option1\nOption2\nOption3" )

#### Parameters

- **roller**: pointer to roller object

**static** uint16\_t **lv\_roller\_get\_anim\_time**(const *lv\_obj\_t* \*roller)

Get the open/close animation time.

**Return** open/close animation time [ms]

#### Parameters

- **roller**: pointer to a roller

bool **lv\_roller\_get\_hor\_fit**(const *lv\_obj\_t* \*roller)

Get the auto width set attribute

**Return** true: auto size enabled; false: manual width settings enabled

#### Parameters

- **roller**: pointer to a roller object

**const** lv\_style\_t \***lv\_roller\_get\_style**(const *lv\_obj\_t* \*roller, *lv\_roller\_style\_t* type)

Get a style of a roller

**Return** style pointer to a style

#### Parameters

- **roller**: pointer to a roller object
- **type**: which style should be get

**struct** lv\_roller\_ext\_t

#### Public Members

*lv\_ddlist\_ext\_t* **ddlist**

*lv\_roller\_mode\_t* **mode**

### Curseur (lv\_slider)

#### Vue d' ensemble

L' objet curseur ressemble à une *barre* complété par un bouton. Le bouton peut être déplacé pour définir une valeur. Le curseur peut également être vertical ou horizontal.

## Valeur et intervalle

Pour définir une valeur initiale, utilisez `lv_slider_set_value(slider, new_value, LV_ANIM_ON/OFF)`. `lv_slider_set_anim_time(slider, anim_time)` définit la durée d'animation en millisecondes.

Pour spécifier l'**intervalle** (valeurs minimum et maximum) la fonction `lv_slider_set_range(slider, min, max)` est utilisée.

## Symétrie

Le curseur peut être dessiné symétriquement par rapport à zéro (de zéro vers la gauche ou la droite) si cela est activé par `lv_slider_set_sym(slider, true)`

## Placement du bouton

Le bouton peut être placé de deux manières :

- sur l'arrière-plan
- sur les bords aux valeurs minimum/maximum

Utilisez `lv_slider_set_knob_in(slider, true/false)` choisir entre les modes (*knob\_in = false* est la valeur par défaut).

## Styles

Vous pouvez modifier les styles du curseur avec `lv_slider_set_style(slider, LV_SLIDER_STYLE_..., &style)`.

- **LV\_SLIDER\_STYLE\_BG** style de l'arrière plan. Toutes les propriétés `style.body` sont utilisées. Les valeurs `padding` rendent le bouton plus grand que l'arrière-plan (les valeurs négatives le rendent plus grand)
- **LV\_SLIDER\_STYLE\_INDIC** style de l'indicateur. Toutes les propriétés `style.body` sont utilisées. Les valeurs `padding` rendent l'indicateur plus petit que l'arrière-plan.
- **LV\_SLIDER\_STYLE\_KNOB** style du bouton. Toutes les propriétés `style.body` sont utilisées sauf `padding`.

## Événements

Outre les [événements génériques](/overview/event.html #evenements-generiques), les événements spéciaux suivants sont envoyés par le curseur :

- **LV\_EVENT\_VALUE\_CHANGED** envoyé quand le curseur est déplacé ou modifié avec les touches.

## Touches

- **LV\_KEY\_UP**, **LV\_KEY\_RIGHT** incrémente la valeur du curseur de 1.
- **LV\_KEY\_DOWN**, **LV\_KEY\_LEFT** décrémente la valeur du curseur de 1.

Apprenez-en plus sur les *touches*.

## Exemple

### C

#### Slider with custo mstyle



code

```
#include "lvgl/lvgl.h"
#include <stdio.h>

static void event_handler(lv_obj_t * obj, lv_event_t event)
{
    if(event == LV_EVENT_VALUE_CHANGED) {
        printf("Value: %d\n", lv_slider_get_value(obj));
    }
}

void lv_ex_slider_1(void)
{
    /*Create styles*/
    static lv_style_t style_bg;
    static lv_style_t style_indic;
    static lv_style_t style_knob;

    lv_style_copy(&style_bg, &lv_style_pretty);
    style_bg.body.main_color = LV_COLOR_BLACK;
    style_bg.body.grad_color = LV_COLOR_GRAY;
    style_bg.body.radius = LV_RADIUS_CIRCLE;
    style_bg.body.border.color = LV_COLOR_WHITE;
```

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```
lv_style_copy(&style_indic, &lv_style_pretty_color);
style_indic.body.radius = LV_RADIUS_CIRCLE;
style_indic.body.shadow.width = 8;
style_indic.body.shadow.color = style_indic.body.main_color;
style_indic.body.padding.left = 3;
style_indic.body.padding.right = 3;
style_indic.body.padding.top = 3;
style_indic.body.padding.bottom = 3;

lv_style_copy(&style_knob, &lv_style_pretty);
style_knob.body.radius = LV_RADIUS_CIRCLE;
style_knob.body.opa = LV_OPA_70;
style_knob.body.padding.top = 10 ;
style_knob.body.padding.bottom = 10 ;

/*Create a slider*/
lv_obj_t * slider = lv_slider_create(lv_scr_act(), NULL);
lv_slider_set_style(slider, LV_SLIDER_STYLE_BG, &style_bg);
lv_slider_set_style(slider, LV_SLIDER_STYLE_INDIC, &style_indic);
lv_slider_set_style(slider, LV_SLIDER_STYLE_KNOB, &style_knob);
lv_obj_align(slider, NULL, LV_ALIGN_CENTER, 0, 0);
lv_obj_set_event_cb(slider, event_handler);
}
```

#### Set value with slider

Welcome to the slider+label demo!  
Move the slider and see that the label  
updates to match it.



code

```
/**
 * @file lv_ex_slider_2.c
 */
```

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```

*/

/*****
 *      INCLUDES
 *****/

#include "lvgl/lvgl.h"
#include <stdio.h>

/*****
 *      DEFINES
 *****/

/*****
 *      TYPEDEFS
 *****/

/*****
 *      STATIC PROTOTYPES
 *****/

static void slider_event_cb(lv_obj_t * slider, lv_event_t event);

/*****
 *      STATIC VARIABLES
 *****/

static lv_obj_t * slider_label;

/*****
 *      MACROS
 *****/

/*****
 *      GLOBAL FUNCTIONS
 *****/

void lv_ex_slider_2(void)
{
    /* Create a slider in the center of the display */
    lv_obj_t * slider = lv_slider_create(lv_scr_act(), NULL);
    lv_obj_set_width(slider, LV_DPI * 2);
    lv_obj_align(slider, NULL, LV_ALIGN_CENTER, 0, 0);
    lv_obj_set_event_cb(slider, slider_event_cb);
    lv_slider_set_range(slider, 0, 100);

    /* Create a label below the slider */
    slider_label = lv_label_create(lv_scr_act(), NULL);
    lv_label_set_text(slider_label, "0");
    lv_obj_set_auto_realign(slider_label, true);
    lv_obj_align(slider_label, slider, LV_ALIGN_OUT_BOTTOM_MID, 0, 10);

    /* Create an informative label */
    lv_obj_t * info = lv_label_create(lv_scr_act(), NULL);
    lv_label_set_text(info, "Welcome to the slider+label demo!\n"
                           "Move the slider and see that the label\n"

```

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```

        "updates to match it.");
    lv_obj_align(info, NULL, LV_ALIGN_IN_TOP_LEFT, 10, 10);
}

/*****
 *   STATIC FUNCTIONS
 *****/

static void slider_event_cb(lv_obj_t * slider, lv_event_t event)
{
    if(event == LV_EVENT_VALUE_CHANGED) {
        static char buf[4]; /* max 3 bytes for number plus 1 null terminating byte */
        snprintf(buf, 4, "%u", lv_slider_get_value(slider));
        lv_label_set_text(slider_label, buf);
    }
}

```

## MicroPython

### Slider with custo mstyle



code

```

def event_handler(obj, event):
    if event == lv.EVENT.VALUE_CHANGED:
        print("Value: %d" % obj.get_value())

# Create styles
style_bg = lv.style_t()
style_indic = lv.style_t()
style_knob = lv.style_t()

```

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```
lv.style_copy(style_bg, lv.style_pretty)
style_bg.body.main_color = lv.color_make(0,0,0)
style_bg.body.grad_color = lv.color_make(0x80, 0x80, 0x80)
style_bg.body.radius = 800 # large enough to make a circle
style_bg.body.border.color = lv.color_make(0xff,0xff,0xff)

lv.style_copy(style_indic, lv.style_pretty_color)
style_indic.body.radius = 800
style_indic.body.shadow.width = 8
style_indic.body.shadow.color = style_indic.body.main_color
style_indic.body.padding.left = 3
style_indic.body.padding.right = 3
style_indic.body.padding.top = 3
style_indic.body.padding.bottom = 3

lv.style_copy(style_knob, lv.style_pretty)
style_knob.body.radius = 800
style_knob.body.opa = lv.OPA_70
style_knob.body.padding.top = 10
style_knob.body.padding.bottom = 10

# Create a slider
slider = lv.slider(lv.scr_act())
slider.set_style(lv.slider.STYLE.BG, style_bg)
slider.set_style(lv.slider.STYLE.INDIC, style_indic)
slider.set_style(lv.slider.STYLE.KNOB, style_knob)
slider.align(None, lv.ALIGN.CENTER, 0, 0)
slider.set_event_cb(event_handler)
```

### Set value with slider

Welcome to the slider+label demo!  
Move the slider and see that the label  
updates to match it.



code

```
def slider_event_cb(slider, event):
    if event == lv.EVENT.VALUE_CHANGED:
        slider_label.set_text("%u" % slider.get_value())

# Create a slider in the center of the display
slider = lv.slider(lv.scr_act())
slider.set_width(200)
slider.align(None, lv.ALIGN.CENTER, 0, 0)
slider.set_event_cb(slider_event_cb)
slider.set_range(0, 100)

# Create a label below the slider
slider_label = lv.label(lv.scr_act())
slider_label.set_text("0")
slider_label.set_auto_realign(True)
slider_label.align(slider, lv.ALIGN.OUT_BOTTOM_MID, 0, 10)

# Create an informative label
info = lv.label(lv.scr_act())
info.set_text("""Welcome to the slider+label demo!
Move the slider and see that the label
updates to match it.""")
info.align(None, lv.ALIGN.IN_TOP_LEFT, 10, 10)
```

## API

### Typedefs

**typedef** uint8\_t **lv\_slider\_style\_t**

### Enums

**enum** [anonymous]  
Built-in styles of slider

*Values:*

**LV\_SLIDER\_STYLE\_BG**

**LV\_SLIDER\_STYLE\_INDIC**  
Slider background style.

**LV\_SLIDER\_STYLE\_KNOB**  
Slider indicator (filled area) style.

### Functions

*lv\_obj\_t* \***lv\_slider\_create**(*lv\_obj\_t* \*par, const *lv\_obj\_t* \*copy)  
Create a slider objects

**Return** pointer to the created slider

#### Parameters

- **par**: pointer to an object, it will be the parent of the new slider

- **copy**: pointer to a slider object, if not NULL then the new object will be copied from it

**static void lv\_slider\_set\_value**(*lv\_obj\_t* \*slider, int16\_t value, *lv\_anim\_enable\_t* anim)

Set a new value on the slider

#### Parameters

- **slider**: pointer to a slider object
- **value**: new value
- **anim**: LV\_ANIM\_ON: set the value with an animation; LV\_ANIM\_OFF: change the value immediately

**static void lv\_slider\_set\_range**(*lv\_obj\_t* \*slider, int16\_t min, int16\_t max)

Set minimum and the maximum values of a bar

#### Parameters

- **slider**: pointer to the slider object
- **min**: minimum value
- **max**: maximum value

**static void lv\_slider\_set\_anim\_time**(*lv\_obj\_t* \*slider, uint16\_t anim\_time)

Make the slider symmetric to zero. The indicator will grow from zero instead of the minimum position.

#### Parameters

- **slider**: pointer to a slider object
- **en**: true: enable disable symmetric behavior; false: disable

**static void lv\_slider\_set\_sym**(*lv\_obj\_t* \*slider, bool en)

Set the animation time of the slider

#### Parameters

- **slider**: pointer to a bar object
- **anim\_time**: the animation time in milliseconds.

**void lv\_slider\_set\_knob\_in**(*lv\_obj\_t* \*slider, bool in)

Set the 'knob in' attribute of a slider

#### Parameters

- **slider**: pointer to slider object
- **in**: true: the knob is drawn always in the slider; false: the knob can be out on the edges

**void lv\_slider\_set\_style**(*lv\_obj\_t* \*slider, *lv\_slider\_style\_t* type, const *lv\_style\_t* \*style)

Set a style of a slider

#### Parameters

- **slider**: pointer to a slider object
- **type**: which style should be set
- **style**: pointer to a style

**int16\_t lv\_slider\_get\_value**(const *lv\_obj\_t* \*slider)

Get the value of a slider

**Return** the value of the slider

#### Parameters

- `slider`: pointer to a slider object

**static** int16\_t **lv\_slider\_get\_min\_value**(const lv\_obj\_t \*slider)

Get the minimum value of a slider

**Return** the minimum value of the slider

**Parameters**

- `slider`: pointer to a slider object

**static** int16\_t **lv\_slider\_get\_max\_value**(const lv\_obj\_t \*slider)

Get the maximum value of a slider

**Return** the maximum value of the slider

**Parameters**

- `slider`: pointer to a slider object

bool **lv\_slider\_is\_dragged**(const lv\_obj\_t \*slider)

Give the slider is being dragged or not

**Return** true: drag in progress false: not dragged

**Parameters**

- `slider`: pointer to a slider object

**static** uint16\_t **lv\_slider\_get\_anim\_time**(lv\_obj\_t \*slider)

Get the animation time of the slider

**Return** the animation time in milliseconds.

**Parameters**

- `slider`: pointer to a slider object

**static** bool **lv\_slider\_get\_sym**(lv\_obj\_t \*slider)

Get whether the slider is symmetric or not.

**Return** true: symmetric is enabled; false: disable

**Parameters**

- `slider`: pointer to a bar object

bool **lv\_slider\_get\_knob\_in**(const lv\_obj\_t \*slider)

Get the 'knob in' attribute of a slider

**Return** true: the knob is drawn always in the slider; false: the knob can be out on the edges

**Parameters**

- `slider`: pointer to slider object

**const** lv\_style\_t \***lv\_slider\_get\_style**(const lv\_obj\_t \*slider, lv\_slider\_style\_t type)

Get a style of a slider

**Return** style pointer to a style

**Parameters**

- `slider`: pointer to a slider object
- `type`: which style should be get

**struct** **lv\_slider\_ext\_t**

## Public Members

```
lv_bar_ext_t bar
const lv_style_t *style_knob
int16_t drag_value
uint8_t knob_in
```

## Spinbox (lv\_spinbox)

### Vue d' ensemble

The Spinbox contains a number as text which can be increased or decreased by *Keys* or API functions. The Spinbox is a modified *Text area*.

### Set format

`lv_spinbox_set_digit_format(spinbox, digit_count, separator_position)` set the format of the number. `digit_count` sets the number of digits. Leading zeros are added to fill the space on the left. `separator_position` sets the number of digit before the decimal point. `0` means no decimal point.

`lv_spinbox_set_padding_left(spinbox, cnt)` add `cnt` “space” characters between the sign and the most left digit.

### Value and ranges

`lv_spinbox_set_range(spinbox, min, max)` sets the range of the Spinbox.

`lv_spinbox_set_value(spinbox, num)` sets the Spinbox' s value manually.

`lv_spinbox_increment(spinbox)` and `lv_spinbox_decrement(spinbox)` increments/decrements the value of the Spinbox.

`lv_spinbox_set_step(spinbox, step)` sets the amount to increment decrement.

### Style usage

The `lv_spinbox_set_style(roller, LV_SPINBOX_STYLE_..., &style)` set the styles of a Spinbox.

- **LV\_SPINBOX\_STYLE\_BG** Style of the background. All `style.body` properties are used. `style.text` is used for label. Default: `lv_style_pretty`
- **LV\_SPINBOX\_STYLE\_SB** Scrollbar' s style which uses all `style.body` properties. `padding.right/bottom` sets horizontal and vertical the scrollbars' padding respectively and the `padding.inner` sets the scrollbar' s width. (default: `lv_style_pretty_color`)
- **LV\_SPINBOX\_STYLE\_CURSOR** Style of the cursor which uses all `style.body` properties including `padding` to make the cursor larger than the digits.

## Events

Besides the [Generic events](#) the following [Special events](#) are sent by the Drop down lists:

- **LV\_EVENT\_VALUE\_CHANGED** sent when the value has changed. (the value is set as event data as `int32_t`)
- **LV\_EVENT\_INSERT** sent by the ancestor Text area but shouldn't be used.

Learn more about [Events](#).

## Keys

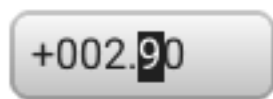
The following *Keys* are processed by the Buttons:

- **LV\_KEY\_LEFT/RIGHT** With *Keypad* move the cursor left/right. With *Encoder* decrement/increment the selected digit.
- **LV\_KEY\_ENTER** Apply the selected option (Send **LV\_EVENT\_VALUE\_CHANGED** event and close the Drop down list)
- **LV\_KEY\_ENTER** With *Encoder* got the next digit. Jump to the first after the last.

## Example

### C

#### Simple Spinbox



code

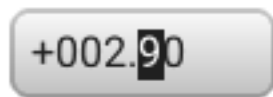
```
#include "lvgl/lvgl.h"
#include <stdio.h>

static void event_handler(lv_obj_t * obj, lv_event_t event)
{
    if(event == LV_EVENT_VALUE_CHANGED) {
        printf("Value: %d\n", lv_spinbox_get_value(obj));
    }
    else if(event == LV_EVENT_CLICKED) {
        /*For simple test: Click the spinbox to increment its value*/
        lv_spinbox_increment(obj);
    }
}

void lv_ex_spinbox_1(void)
{
    lv_obj_t * spinbox;
    spinbox = lv_spinbox_create(lv_scr_act(), NULL);
    lv_spinbox_set_digit_format(spinbox, 5, 3);
    lv_spinbox_step_prev(spinbox);
    lv_obj_set_width(spinbox, 100);
    lv_obj_align(spinbox, NULL, LV_ALIGN_CENTER, 0, 0);
    lv_obj_set_event_cb(spinbox, event_handler);
}
```

## MicroPython

### Simple Spinbox



code



```
def event_handler(obj, event):
    if event == lv.EVENT.VALUE_CHANGED:
        print("Value: %d" % obj.get_value())
    elif event == lv.EVENT.CLICKED:
        # For simple test: Click the spinbox to increment its value
        obj.increment()

spinbox = lv.spinbox(lv.scr_act())
spinbox.set_digit_format(5, 3)
spinbox.step_prev()
spinbox.set_width(100)
spinbox.align(None, lv.ALIGN.CENTER, 0, 0)
spinbox.set_event_cb(event_handler)
```

## API

### Typedefs

**typedef** uint8\_t **lv\_spinbox\_style\_t**

### Enums

**enum** [anonymous]

*Values:*

**LV\_SPINBOX\_STYLE\_BG**

**LV\_SPINBOX\_STYLE\_SB**

**LV\_SPINBOX\_STYLE\_CURSOR**

### Functions

*lv\_obj\_t* \***lv\_spinbox\_create**(*lv\_obj\_t* \*par, const *lv\_obj\_t* \*copy)

Create a spinbox objects

**Return** pointer to the created spinbox

#### Parameters

- **par**: pointer to an object, it will be the parent of the new spinbox
- **copy**: pointer to a spinbox object, if not NULL then the new object will be copied from it

**static** void **lv\_spinbox\_set\_style**(*lv\_obj\_t* \*spinbox, *lv\_spinbox\_style\_t* type, *lv\_style\_t* \*style)

Set a style of a spinbox.

#### Parameters

- **templ**: pointer to template object
- **type**: which style should be set
- **style**: pointer to a style

void **lv\_spinbox\_set\_value**(*lv\_obj\_t* \*spinbox, int32\_t i)

Set spinbox value

#### Parameters

- **spinbox**: pointer to spinbox
- **i**: value to be set

void **lv\_spinbox\_set\_digit\_format**(*lv\_obj\_t \*spinbox*, uint8\_t *digit\_count*, uint8\_t *separator\_position*)

Set spinbox digit format (digit count and decimal format)

#### Parameters

- **spinbox**: pointer to spinbox
- **digit\_count**: number of digit excluding the decimal separator and the sign
- **separator\_position**: number of digit before the decimal point. If 0, decimal point is not shown

void **lv\_spinbox\_set\_step**(*lv\_obj\_t \*spinbox*, uint32\_t *step*)

Set spinbox step

#### Parameters

- **spinbox**: pointer to spinbox
- **step**: steps on increment/decrement

void **lv\_spinbox\_set\_range**(*lv\_obj\_t \*spinbox*, int32\_t *range\_min*, int32\_t *range\_max*)

Set spinbox value range

#### Parameters

- **spinbox**: pointer to spinbox
- **range\_min**: maximum value, inclusive
- **range\_max**: minimum value, inclusive

void **lv\_spinbox\_set\_padding\_left**(*lv\_obj\_t \*spinbox*, uint8\_t *padding*)

Set spinbox left padding in digits count (added between sign and first digit)

#### Parameters

- **spinbox**: pointer to spinbox
- **cb**: Callback function called on value change event

**static const** lv\_style\_t \***lv\_spinbox\_get\_style**(*lv\_obj\_t \*spinbox*, *lv\_spinbox\_style\_t type*)

Get style of a spinbox.

**Return** style pointer to the style

#### Parameters

- **templ**: pointer to template object
- **type**: which style should be get

int32\_t **lv\_spinbox\_get\_value**(*lv\_obj\_t \*spinbox*)

Get the spinbox numeral value (user has to convert to float according to its digit format)

**Return** value integer value of the spinbox

#### Parameters

- **spinbox**: pointer to spinbox

void **lv\_spinbox\_step\_next**(*lv\_obj\_t \*spinbox*)  
 Select next lower digit for edition by dividing the step by 10

**Parameters**

- **spinbox**: pointer to spinbox

void **lv\_spinbox\_step\_prev**(*lv\_obj\_t \*spinbox*)  
 Select next higher digit for edition by multiplying the step by 10

**Parameters**

- **spinbox**: pointer to spinbox

void **lv\_spinbox\_increment**(*lv\_obj\_t \*spinbox*)  
 Increment spinbox value by one step

**Parameters**

- **spinbox**: pointer to spinbox

void **lv\_spinbox\_decrement**(*lv\_obj\_t \*spinbox*)  
 Decrement spinbox value by one step

**Parameters**

- **spinbox**: pointer to spinbox

**struct lv\_spinbox\_ext\_t**

**Public Members**

*lv\_ta\_ext\_t* **ta**  
 int32\_t **value**  
 int32\_t **range\_max**  
 int32\_t **range\_min**  
 int32\_t **step**  
 uint16\_t **digit\_count**  
 uint16\_t **dec\_point\_pos**  
 uint16\_t **digit\_padding\_left**

**Example**

**Commutateur (lv\_sw)**

**Vue d' ensemble**

Le commutateur peut être utilisé pour activer/désactiver quelque chose. Il ressemble à un petit curseur.

## Changer d' état

Pour changer l' état du commutateur

- Cliquer dessus,
- Le faire glisser,
- Utiliser les fonctions `lv_sw_on(sw, LV_ANIM_ON/OFF)`, `lv_sw_off(sw, LV_ANIM_ON/OFF)` ou `lv_sw_toggle(sw, LV_ANOM_ON/OFF)`.

## Durée d' animation

La durée des animations quand le commutateur change d' état peut être ajusté avec `lv_sw_set_anim_time(sw, anim_time_ms)`.

## Styles

Vous pouvez définir les styles du commutateur avec `lv_sw_set_style(sw, LV_SW_STYLE_..., &style)`.

- **LV\_SW\_STYLE\_BG** style de l' arrière plan. Toutes les propriétés `style.body` sont utilisées. Les valeurs `padding` rendent le commutateur plus petit que le bouton (une valeur négative le rend plus grand).
- **LV\_SW\_STYLE\_INDIC** style de l' indicateur. Toutes les propriétés `style.body` sont utilisées. Les valeurs `padding` rendent l' indicateur plus petit que l' arrière-plan.
- **LV\_SW\_STYLE\_KNOB\_OFF** style du bouton lorsque le commutateur est désactivé. Les propriétés `style.body` sont utilisées sauf `padding`.
- **LV\_SW\_STYLE\_KNOB\_ON** Style du bouton lorsque le commutateur est activé. Les propriétés `style.body` sont utilisées sauf `padding`.

## Événements

Outre les [événements génériques](/overview/event.html #evenements-generiques), les événements spéciaux suivants sont envoyés par les commutateurs :

- **LV\_EVENT\_VALUE\_CHANGED** envoyé lorsque le commutateur change d' état.

## Touches

- **LV\_KEY\_UP**, **LV\_KEY\_RIGHT** active le commutateur.
- **LV\_KEY\_DOWN**, **LV\_KEY\_LEFT** désactive le commutateur.

Apprenez-en plus sur les *touches*.

## Exemple

### C

## Simple Switch



code

```
#include "lvgl/lvgl.h"
#include <stdio.h>

static void event_handler(lv_obj_t * obj, lv_event_t event)
{
    if(event == LV_EVENT_VALUE_CHANGED) {
        printf("State: %s\n", lv_sw_get_state(obj) ? "On" : "Off");
    }
}

void lv_ex_sw_1(void)
{
    /*Create styles for the switch*/
    static lv_style_t bg_style;
    static lv_style_t indic_style;
    static lv_style_t knob_on_style;
    static lv_style_t knob_off_style;

    lv_style_copy(&bg_style, &lv_style_pretty);
    bg_style.body.radius = LV_RADIUS_CIRCLE;
    bg_style.body.padding.top = 6;
    bg_style.body.padding.bottom = 6;

    lv_style_copy(&indic_style, &lv_style_pretty_color);
    indic_style.body.radius = LV_RADIUS_CIRCLE;
    indic_style.body.main_color = lv_color_hex(0x9fc8ef);
    indic_style.body.grad_color = lv_color_hex(0x9fc8ef);
    indic_style.body.padding.left = 0;
    indic_style.body.padding.right = 0;
    indic_style.body.padding.top = 0;
    indic_style.body.padding.bottom = 0;
}
```

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```
lv_style_copy(&knob_off_style, &lv_style_pretty);
knob_off_style.body.radius = LV_RADIUS_CIRCLE;
knob_off_style.body.shadow.width = 4;
knob_off_style.body.shadow.type = LV_SHADOW_BOTTOM;

lv_style_copy(&knob_on_style, &lv_style_pretty_color);
knob_on_style.body.radius = LV_RADIUS_CIRCLE;
knob_on_style.body.shadow.width = 4;
knob_on_style.body.shadow.type = LV_SHADOW_BOTTOM;

/*Create a switch and apply the styles*/
lv_obj_t *sw1 = lv_sw_create(lv_scr_act(), NULL);
lv_sw_set_style(sw1, LV_SW_STYLE_BG, &bg_style);
lv_sw_set_style(sw1, LV_SW_STYLE_INDIC, &indic_style);
lv_sw_set_style(sw1, LV_SW_STYLE_KNOB_ON, &knob_on_style);
lv_sw_set_style(sw1, LV_SW_STYLE_KNOB_OFF, &knob_off_style);
lv_obj_align(sw1, NULL, LV_ALIGN_CENTER, 0, -50);
lv_obj_set_event_cb(sw1, event_handler);

/*Copy the first switch and turn it ON*/
lv_obj_t *sw2 = lv_sw_create(lv_scr_act(), sw1);
lv_sw_on(sw2, LV_ANIM_ON);
lv_obj_align(sw2, NULL, LV_ALIGN_CENTER, 0, 50);
}
```

## MicroPython

### Simple Switch



code

```
def event_handler(obj, event):
    if event == lv.EVENT.VALUE_CHANGED:
        print("State: %s" % ("On" if obj.get_state() else "Off"))

# Create styles for the switch
bg_style = lv.style_t()
indic_style = lv.style_t()
knob_on_style = lv.style_t()
knob_off_style = lv.style_t()

lv.style_copy(bg_style, lv.style_pretty)
bg_style.body.radius = 800
bg_style.body.padding.top = 6
bg_style.body.padding.bottom = 6

lv.style_copy(indic_style, lv.style_pretty_color)
indic_style.body.radius = 800
indic_style.body.main_color = lv.color_hex(0x9fc8ef)
indic_style.body.grad_color = lv.color_hex(0x9fc8ef)
indic_style.body.padding.left = 0
indic_style.body.padding.right = 0
indic_style.body.padding.top = 0
indic_style.body.padding.bottom = 0

lv.style_copy(knob_off_style, lv.style_pretty)
knob_off_style.body.radius = 800
knob_off_style.body.shadow.width = 4
knob_off_style.body.shadow.type = lv.SHADOW.BOTTOM

lv.style_copy(knob_on_style, lv.style_pretty_color)
knob_on_style.body.radius = 800
knob_on_style.body.shadow.width = 4
knob_on_style.body.shadow.type = lv.SHADOW.BOTTOM

# Create a switch and apply the styles
sw1 = lv.sw(lv.scr_act())
sw1.set_style(lv.sw.STYLE.BG, bg_style)
sw1.set_style(lv.sw.STYLE.INDIC, indic_style)
sw1.set_style(lv.sw.STYLE.KNOB_ON, knob_on_style)
sw1.set_style(lv.sw.STYLE.KNOB_OFF, knob_off_style)
sw1.align(None, lv.ALIGN.CENTER, 0, -50)
sw1.set_event_cb(event_handler)

# Copy the first switch and turn it ON
sw2 = lv.sw(lv.scr_act(), sw1)
sw2.on(lv.ANIM.ON)
sw2.align(None, lv.ALIGN.CENTER, 0, 50)
sw2.set_event_cb(lambda o,e: None)
```

## API

### Typedefs

```
typedef uint8_t lv_sw_style_t
```

## Enums

**enum** [anonymous]

Switch styles.

*Values:*

**LV\_SW\_STYLE\_BG**

Switch background.

**LV\_SW\_STYLE\_INDIC**

Switch fill area.

**LV\_SW\_STYLE\_KNOB\_OFF**

Switch knob (when off).

**LV\_SW\_STYLE\_KNOB\_ON**

Switch knob (when on).

## Functions

*lv\_obj\_t* \***lv\_sw\_create**(*lv\_obj\_t* \*par, const *lv\_obj\_t* \*copy)

Create a switch objects

**Return** pointer to the created switch

**Parameters**

- **par**: pointer to an object, it will be the parent of the new switch
- **copy**: pointer to a switch object, if not NULL then the new object will be copied from it

void **lv\_sw\_on**(*lv\_obj\_t* \*sw, *lv\_anim\_enable\_t* anim)

Turn ON the switch

**Parameters**

- **sw**: pointer to a switch object
- **anim**: LV\_ANIM\_ON: set the value with an animation; LV\_ANIM\_OFF: change the value immediately

void **lv\_sw\_off**(*lv\_obj\_t* \*sw, *lv\_anim\_enable\_t* anim)

Turn OFF the switch

**Parameters**

- **sw**: pointer to a switch object
- **anim**: LV\_ANIM\_ON: set the value with an animation; LV\_ANIM\_OFF: change the value immediately

bool **lv\_sw\_toggle**(*lv\_obj\_t* \*sw, *lv\_anim\_enable\_t* anim)

Toggle the position of the switch

**Return** resulting state of the switch.

**Parameters**

- **sw**: pointer to a switch object
- **anim**: LV\_ANIM\_ON: set the value with an animation; LV\_ANIM\_OFF: change the value immediately



void **lv\_sw\_set\_style**(*lv\_obj\_t* \*sw, *lv\_sw\_style\_t* type, **const** *lv\_style\_t* \*style)  
Set a style of a switch

**Parameters**

- **sw**: pointer to a switch object
- **type**: which style should be set
- **style**: pointer to a style

void **lv\_sw\_set\_anim\_time**(*lv\_obj\_t* \*sw, *uint16\_t* anim\_time)  
Set the animation time of the switch

**Return** style pointer to a style

**Parameters**

- **sw**: pointer to a switch object
- **anim\_time**: animation time

**static** bool **lv\_sw\_get\_state**(**const** *lv\_obj\_t* \*sw)  
Get the state of a switch

**Return** false: OFF; true: ON

**Parameters**

- **sw**: pointer to a switch object

**const** *lv\_style\_t* \***lv\_sw\_get\_style**(**const** *lv\_obj\_t* \*sw, *lv\_sw\_style\_t* type)  
Get a style of a switch

**Return** style pointer to a style

**Parameters**

- **sw**: pointer to a switch object
- **type**: which style should be get

*uint16\_t* **lv\_sw\_get\_anim\_time**(**const** *lv\_obj\_t* \*sw)  
Get the animation time of the switch

**Return** style pointer to a style

**Parameters**

- **sw**: pointer to a switch object

**struct** **lv\_sw\_ext\_t**

**Public Members**

*lv\_slider\_ext\_t* **slider**

**const** *lv\_style\_t* \***style\_knob\_off**  
Style of the knob when the switch is OFF

**const** *lv\_style\_t* \***style\_knob\_on**  
Style of the knob when the switch is ON (NULL to use the same as OFF)

*lv\_coord\_t* **start\_x**

*uint8\_t* **changed**

```
uint8_t slided
uint16_t anim_time
```

## Table (lv\_table)

### Vue d' ensemble

Comme d' habitude, les tables sont construites à partir de lignes, de colonnes et de cellules contenant des textes.

L' objet table est très léger, car seuls les textes sont enregistrés. Aucun objet réel n' est créé pour les cellules, elles sont simplement dessinées à la volée.

### Lignes et colonnes

Pour définir le nombre de lignes et de colonnes, utilisez `lv_table_set_row_cnt(table, row_cnt)` et `lv_table_set_col_cnt(table, col_cnt)`.

### Largeur et hauteur

La largeur des colonnes peut être définie avec `lv_table_set_col_width(table, col_id, width)`. La largeur totale de l' objet table sera définie par la somme des largeurs des colonnes.

La hauteur est calculée automatiquement à partir des styles des cellule (police, marges, etc.) et du nombre de lignes.

### Définir la valeur de la cellule

Les cellules peuvent enregistrer uniquement du texte, il est donc nécessaire de convertir les nombres en texte avant de les afficher dans une table.

`lv_table_set_cell_value(table, row, col, "Content")`. Le texte est sauvegardé par la table et peut donc être une variable locale.

Le saut de ligne peut être utilisé dans le texte comme `"Value\n60.3"`.

### Alignement

L' alignement du texte dans les cellules peut être ajusté individuellement avec `lv_table_set_cell_align(table, row, col, LV_LABEL_ALIGN_LEFT/CENTER/RIGHT)`.

### Type de cellule

Vous pouvez utiliser 4 types de cellules différents. Chacun a son propre style.

Les types de cellules peuvent être utilisés pour ajouter un style différent, par exemple pour :

- en-tête de table
- première colonne

- mise en évidence d' une cellule
- etc

Le type peut être sélectionné avec `lv_table_set_cell_type(table, row, col, type)` type peut être 1, 2, 3 ou 4.

### Fusionner des cellules

Les cellules peuvent être fusionnées horizontalement avec `lv_table_set_cell_merge_right(table, col, row, true)`. Pour fusionner davantage de cellules adjacentes, appliquez cette fonction à chaque cellule.

### Crop text

Par défaut, des retours à la ligne sont insérés pour permettre aux texte de s' inscrire dans la largeur de la cellule, et la hauteur de la cellule est définie automatiquement. Pour désactiver ce comportement et conserver le texte tel qu' il est, activez `lv_table_set_cell_crop(table, row, col, true)`.

### Défilement

Pour pouvoir faire défiler la table, placez-la sur une [page](#)

### Styles

Utilisez `lv_table_set_style(table, lv_table_set_style..., &style)` pour définir un nouveau style pour un élément de la table :

- **LV\_PAGE\_STYLE\_BG** style de l' arrière-plan qui utilise toutes les propriétés `style.body` (valeur par défaut : `lv_style_plain_color`).
- **LV\_PAGE\_STYLE\_CELL1/2/3/4** 4 styles pour les 4 types de cellules. Toutes les propriétés `style.body` sont utilisées. (valeur par défaut : `lv_style_plain`).

### Evénements

Seuls les [événements génériques](#) sont envoyés par ce type d' objet.

Apprenez-en plus sur les [événements](#).

### Touches

Aucune *touche* n' est traitée par ce type d' objet.

Apprenez-en plus sur les [touches](#).

## Exemple

### C

#### Simple table

Name	Price
Apple	\$7
Banana	\$4
Citron	\$6

code

```
#include "lvgl/lvgl.h"

void lv_ex_table_1(void)
{
    /*Create a normal cell style*/
    static lv_style_t style_cell1;
    lv_style_copy(&style_cell1, &lv_style_plain);
    style_cell1.body.border.width = 1;
    style_cell1.body.border.color = LV_COLOR_BLACK;

    /*Create a header cell style*/
    static lv_style_t style_cell2;
    lv_style_copy(&style_cell2, &lv_style_plain);
    style_cell2.body.border.width = 1;
    style_cell2.body.border.color = LV_COLOR_BLACK;
    style_cell2.body.main_color = LV_COLOR_SILVER;
    style_cell2.body.grad_color = LV_COLOR_SILVER;

    lv_obj_t * table = lv_table_create(lv_scr_act(), NULL);
    lv_table_set_style(table, LV_TABLE_STYLE_CELL1, &style_cell1);
    lv_table_set_style(table, LV_TABLE_STYLE_CELL2, &style_cell2);
    lv_table_set_style(table, LV_TABLE_STYLE_BG, &lv_style_transp_tight);
    lv_table_set_col_cnt(table, 2);
    lv_table_set_row_cnt(table, 4);
    lv_obj_align(table, NULL, LV_ALIGN_CENTER, 0, 0);
}
```

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```

/*Make the cells of the first row center aligned */
lv_table_set_cell_align(table, 0, 0, LV_LABEL_ALIGN_CENTER);
lv_table_set_cell_align(table, 0, 1, LV_LABEL_ALIGN_CENTER);

/*Make the cells of the first row TYPE = 2 (use `style_cell2`) */
lv_table_set_cell_type(table, 0, 0, 2);
lv_table_set_cell_type(table, 0, 1, 2);

/*Fill the first column*/
lv_table_set_cell_value(table, 0, 0, "Name");
lv_table_set_cell_value(table, 1, 0, "Apple");
lv_table_set_cell_value(table, 2, 0, "Banana");
lv_table_set_cell_value(table, 3, 0, "Citron");

/*Fill the second column*/
lv_table_set_cell_value(table, 0, 1, "Price");
lv_table_set_cell_value(table, 1, 1, "$7");
lv_table_set_cell_value(table, 2, 1, "$4");
lv_table_set_cell_value(table, 3, 1, "$6");
}

```

## MicroPython

### Simple table

Name	Price
Apple	\$7
Banana	\$4
Citron	\$6

code

```

# Create a normal cell style
style_cell1 = lv.style_t()
lv.style_copy(style_cell1, lv.style_plain)

```

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(continued from previous page)

```

style_cell1.body.border.width = 1
style_cell1.body.border.color = lv.color_make(0,0,0)

# Create a header cell style
style_cell2 = lv.style_t()
lv.style_copy(style_cell2, lv.style_plain)
style_cell2.body.border.width = 1
style_cell2.body.border.color = lv.color_make(0,0,0)
style_cell2.body.main_color = lv.color_make(0xC0, 0xC0, 0xC0)
style_cell2.body.grad_color = lv.color_make(0xC0, 0xC0, 0xC0)

table = lv.table(lv.scr_act())
table.set_style(lv.table.STYLE.CELL1, style_cell1)
table.set_style(lv.table.STYLE.CELL2, style_cell2)
table.set_style(lv.table.STYLE.BG, lv.style_transp_tight)
table.set_col_cnt(2)
table.set_row_cnt(4)
table.align(None, lv.ALIGN.CENTER, 0, 0)

# Make the cells of the first row center aligned
table.set_cell_align(0, 0, lv.label.ALIGN.CENTER)
table.set_cell_align(0, 1, lv.label.ALIGN.CENTER)

# Make the cells of the first row TYPE = 2 (use `style_cell2`)
table.set_cell_type(0, 0, 2)
table.set_cell_type(0, 1, 2)

# Fill the first column
table.set_cell_value(0, 0, "Name")
table.set_cell_value(1, 0, "Apple")
table.set_cell_value(2, 0, "Banana")
table.set_cell_value(3, 0, "Citron")

# Fill the second column
table.set_cell_value(0, 1, "Price")
table.set_cell_value(1, 1, "$7")
table.set_cell_value(2, 1, "$4")
table.set_cell_value(3, 1, "$6")

```

## MicroPython

Pas encore d' exemple.

## API

### Typedefs

**typedef** uint8\_t **lv\_table\_style\_t**

### Enums

**enum** [anonymous]  
*Values:*

LV\_TABLE\_STYLE\_BG  
 LV\_TABLE\_STYLE\_CELL1  
 LV\_TABLE\_STYLE\_CELL2  
 LV\_TABLE\_STYLE\_CELL3  
 LV\_TABLE\_STYLE\_CELL4

## Functions

*lv\_obj\_t* \***lv\_table\_create**(*lv\_obj\_t* \**par*, **const** *lv\_obj\_t* \**copy*)

Create a table object

**Return** pointer to the created table

### Parameters

- **par**: pointer to an object, it will be the parent of the new table
- **copy**: pointer to a table object, if not NULL then the new object will be copied from it

void **lv\_table\_set\_cell\_value**(*lv\_obj\_t* \**table*, uint16\_t *row*, uint16\_t *col*, **const** char \**txt*)

Set the value of a cell.

### Parameters

- **table**: pointer to a Table object
- **row**: id of the row [0 .. row\_cnt -1]
- **col**: id of the column [0 .. col\_cnt -1]
- **txt**: text to display in the cell. It will be copied and saved so this variable is not required after this function call.

void **lv\_table\_set\_row\_cnt**(*lv\_obj\_t* \**table*, uint16\_t *row\_cnt*)

Set the number of rows

### Parameters

- **table**: table pointer to a Table object
- **row\_cnt**: number of rows

void **lv\_table\_set\_col\_cnt**(*lv\_obj\_t* \**table*, uint16\_t *col\_cnt*)

Set the number of columns

### Parameters

- **table**: table pointer to a Table object
- **col\_cnt**: number of columns. Must be < LV\_TABLE\_COL\_MAX

void **lv\_table\_set\_col\_width**(*lv\_obj\_t* \**table*, uint16\_t *col\_id*, lv\_coord\_t *w*)

Set the width of a column

### Parameters

- **table**: table pointer to a Table object
- **col\_id**: id of the column [0 .. LV\_TABLE\_COL\_MAX -1]
- **w**: width of the column

```
void lv_table_set_cell_align(lv_obj_t *table, uint16_t row, uint16_t col, lv_label_align_t align)
```

Set the text align in a cell

#### Parameters

- **table**: pointer to a Table object
- **row**: id of the row [0 .. row\_cnt -1]
- **col**: id of the column [0 .. col\_cnt -1]
- **align**: LV\_LABEL\_ALIGN\_LEFT or LV\_LABEL\_ALIGN\_CENTER or LV\_LABEL\_ALIGN\_RIGHT

```
void lv_table_set_cell_type(lv_obj_t *table, uint16_t row, uint16_t col, uint8_t type)
```

Set the type of a cell.

#### Parameters

- **table**: pointer to a Table object
- **row**: id of the row [0 .. row\_cnt -1]
- **col**: id of the column [0 .. col\_cnt -1]
- **type**: 1,2,3 or 4. The cell style will be chosen accordingly.

```
void lv_table_set_cell_crop(lv_obj_t *table, uint16_t row, uint16_t col, bool crop)
```

Set the cell crop. (Don't adjust the height of the cell according to its content)

#### Parameters

- **table**: pointer to a Table object
- **row**: id of the row [0 .. row\_cnt -1]
- **col**: id of the column [0 .. col\_cnt -1]
- **crop**: true: crop the cell content; false: set the cell height to the content.

```
void lv_table_set_cell_merge_right(lv_obj_t *table, uint16_t row, uint16_t col, bool en)
```

Merge a cell with the right neighbor. The value of the cell to the right won't be displayed.

#### Parameters

- **table**: table pointer to a Table object
- **row**: id of the row [0 .. row\_cnt -1]
- **col**: id of the column [0 .. col\_cnt -1]
- **en**: true: merge right; false: don't merge right

```
void lv_table_set_style(lv_obj_t *table, lv_table_style_t type, const lv_style_t *style)
```

Set a style of a table.

#### Parameters

- **table**: pointer to table object
- **type**: which style should be set
- **style**: pointer to a style

```
const char *lv_table_get_cell_value(lv_obj_t *table, uint16_t row, uint16_t col)
```

Get the value of a cell.

**Return** text in the cell



#### Parameters

- **table**: pointer to a Table object
- **row**: id of the row [0 .. row\_cnt -1]
- **col**: id of the column [0 .. col\_cnt -1]

uint16\_t **lv\_table\_get\_row\_cnt**(*lv\_obj\_t* \*table)

Get the number of rows.

**Return** number of rows.

#### Parameters

- **table**: table pointer to a Table object

uint16\_t **lv\_table\_get\_col\_cnt**(*lv\_obj\_t* \*table)

Get the number of columns.

**Return** number of columns.

#### Parameters

- **table**: table pointer to a Table object

lv\_coord\_t **lv\_table\_get\_col\_width**(*lv\_obj\_t* \*table, uint16\_t col\_id)

Get the width of a column

**Return** width of the column

#### Parameters

- **table**: table pointer to a Table object
- **col\_id**: id of the column [0 .. LV\_TABLE\_COL\_MAX -1]

lv\_label\_align\_t **lv\_table\_get\_cell\_align**(*lv\_obj\_t* \*table, uint16\_t row, uint16\_t col)

Get the text align of a cell

**Return** LV\_LABEL\_ALIGN\_LEFT (default in case of error) or LV\_LABEL\_ALIGN\_CENTER or LV\_LABEL\_ALIGN\_RIGHT

#### Parameters

- **table**: pointer to a Table object
- **row**: id of the row [0 .. row\_cnt -1]
- **col**: id of the column [0 .. col\_cnt -1]

lv\_label\_align\_t **lv\_table\_get\_cell\_type**(*lv\_obj\_t* \*table, uint16\_t row, uint16\_t col)

Get the type of a cell

**Return** 1,2,3 or 4

#### Parameters

- **table**: pointer to a Table object
- **row**: id of the row [0 .. row\_cnt -1]
- **col**: id of the column [0 .. col\_cnt -1]

lv\_label\_align\_t **lv\_table\_get\_cell\_crop**(*lv\_obj\_t* \*table, uint16\_t row, uint16\_t col)

Get the crop property of a cell

**Return** true: text crop enabled; false: disabled

#### Parameters

- **table**: pointer to a Table object
- **row**: id of the row [0 .. row\_cnt -1]
- **col**: id of the column [0 .. col\_cnt -1]

bool **lv\_table\_get\_cell\_merge\_right**(*lv\_obj\_t* \*table, uint16\_t row, uint16\_t col)  
Get the cell merge attribute.

**Return** true: merge right; false: don't merge right

#### Parameters

- **table**: table pointer to a Table object
- **row**: id of the row [0 .. row\_cnt -1]
- **col**: id of the column [0 .. col\_cnt -1]

const lv\_style\_t \***lv\_table\_get\_style**(const *lv\_obj\_t* \*table, *lv\_table\_style\_t* type)  
Get style of a table.

**Return** style pointer to the style

#### Parameters

- **table**: pointer to table object
- **type**: which style should be get

**union lv\_table\_cell\_format\_t**  
*#include <lv\_table.h>* Internal table cell format structure.  
Use the **lv\_table** APIs instead.

#### Public Members

uint8\_t **align**  
uint8\_t **right\_merge**  
uint8\_t **type**  
uint8\_t **crop**  
**struct** *lv\_table\_cell\_format\_t*::[anonymous] s  
uint8\_t **format\_byte**

**struct lv\_table\_ext\_t**

#### Public Members

uint16\_t **col\_cnt**  
uint16\_t **row\_cnt**  
char \*\***cell\_data**  
**const** lv\_style\_t \***cell\_style**[LV\_TABLE\_CELL\_STYLE\_CNT]  
lv\_coord\_t **col\_w**[LV\_TABLE\_COL\_MAX]

## Classeur d' onglets (lv\_tabview)

### Vue d' ensemble

L' objet classeur d' onglets peut être utilisé pour organiser du contenu dans des onglets.

### Ajouter un onglet

Vous pouvez ajouter de nouveaux onglets avec `lv_tabview_add_tab(tabview, "Tab name")`. La fonction retourne un pointeur sur un objet *page* dans lequel vous pouvez ajouter le contenu de l' onglet.

### Changer d' onglet

Pour sélectionner un nouvel onglet, vous pouvez :

- Cliquer dessus dans la partie en-tête
- Glisser horizontalement
- Utiliser la fonction `lv_tabview_set_tab_act(tabview, id, LV_ANIM_ON/OFF)`

Le glissement manuel peut être désactivé avec `lv_tabview_set_sliding(tabview, false)`.

### Position des boutons d' onglet

Par défaut, les boutons de sélection des onglets sont placés en haut du classeur d' onglets. Cela peut être changé avec `lv_tabview_set_btns_pos(tabview, LV_TABVIEW_BTNS_POS_TOP/BOTTOM/LEFT/RIGHT)`

Notez que vous ne pouvez pas modifier la position de haut ou bas vers gauche ou droite lorsque des onglets sont déjà ajoutés.

### Cacher des onglets

Les boutons peuvent être cachés par `lv_tabview_set_btns_hidden(tabview, true)`

### Durée d' animation

La durée d' animation est ajustée par `lv_tabview_set_anim_time(tabview, anim_time_ms)`. Cela est utilisé lorsque le nouvel onglet est affiché.

### Styles

Utilisez `lv_tabview_set_style(tabview, LV_TABVIEW_STYLE_..., &style)` pour définir un nouveau style pour un élément du classeur d' onglets :

- **LV\_TABVIEW\_STYLE\_BG** arrière-plan principal qui utilise toutes les propriétés `style.body` (valeur par défaut : `lv_style_plain`).

- **LV\_TABVIEW\_STYLE\_INDIC** un fin rectangle pour indiquer l'onglet courant. Utilise toutes les propriétés **style.body**. Sa hauteur provient de **body.padding.inner** (valeur par défaut: **lv\_style\_plain\_color**).
- **LV\_TABVIEW\_STYLE\_BTN\_BG** style de l'arrière-plan des boutons d'onglets. Utilise toutes les propriétés **style.body**. La hauteur de l'en-tête sera définie automatiquement en fonction de **body.padding.top/bottom** (valeur par défaut : **lv\_style\_transp**).
- **LV\_TABVIEW\_STYLE\_BTN\_REL** style des boutons d'onglets relâchés. Utilise toutes les propriétés **style.body** (valeur par défaut : **lv\_style\_tbn\_rel**).
- **LV\_TABVIEW\_STYLE\_BTN\_PR** style des boutons d'onglets pressés. Utilise toutes les propriétés **style.body** (valeur par défaut : **lv\_style\_tbn\_pr**).
- **LV\_TABVIEW\_STYLE\_BTN\_TGL\_REL** style des boutons d'onglets sélectionnés relâchés. Utilise toutes les propriétés **style.body** (valeur par défaut : **lv\_style\_tbn\_tgl\_rel**).
- **LV\_TABVIEW\_STYLE\_BTN\_TGL\_PR** style des boutons d'onglets sélectionnés pressés. Utilise toutes les propriétés **style.body** (valeur par défaut : **lv\_style\_tbn\_tgl\_pr**).

La hauteur de l'en-tête est calculée ainsi : *font height + padding.top + padding.bottom* à partir de **LV\_TABVIEW\_STYLE\_BTN\_REL** + *padding.top + padding bottom* à partir de **LV\_TABVIEW\_STYLE\_BTN\_BG**

## Événements

Outre les [événements génériques](/overview/event.html #evenements-generiques), les événements spéciaux suivants sont envoyés par le classeur d'onglets :

- **LV\_EVENT\_VALUE\_CHANGED** envoyé lorsque un nouvel onglet est sélectionné par glissé ou clic sur le bouton d'onglet.

Apprenez-en plus sur les *événements*.

## Touches

Les *touches* suivantes sont traitées par le classeur d'onglets :

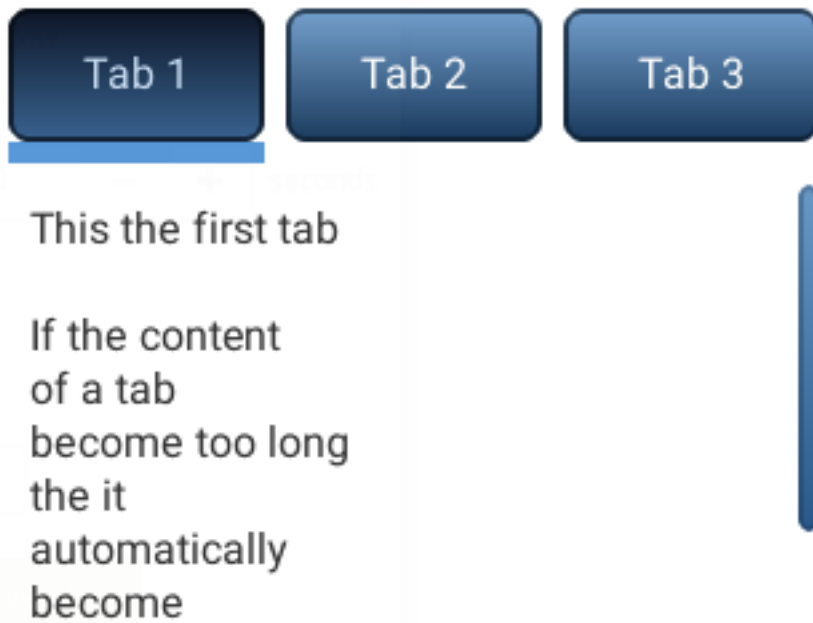
- **LV\_KEY\_RIGHT/LEFT** sélectionne un onglet.
- **LV\_KEY\_ENTER** passe à l'onglet sélectionné

Apprenez-en plus sur les *touches*.

## Exemple

C

## Simple Tabview



code

```
#include "lvgl/lvgl.h"

void lv_ex_tabview_1(void)
{
    /*Create a Tab view object*/
    lv_obj_t *tabview;
    tabview = lv_tabview_create(lv_scr_act(), NULL);

    /*Add 3 tabs (the tabs are page (lv_page) and can be scrolled*/
    lv_obj_t *tab1 = lv_tabview_add_tab(tabview, "Tab 1");
    lv_obj_t *tab2 = lv_tabview_add_tab(tabview, "Tab 2");
    lv_obj_t *tab3 = lv_tabview_add_tab(tabview, "Tab 3");

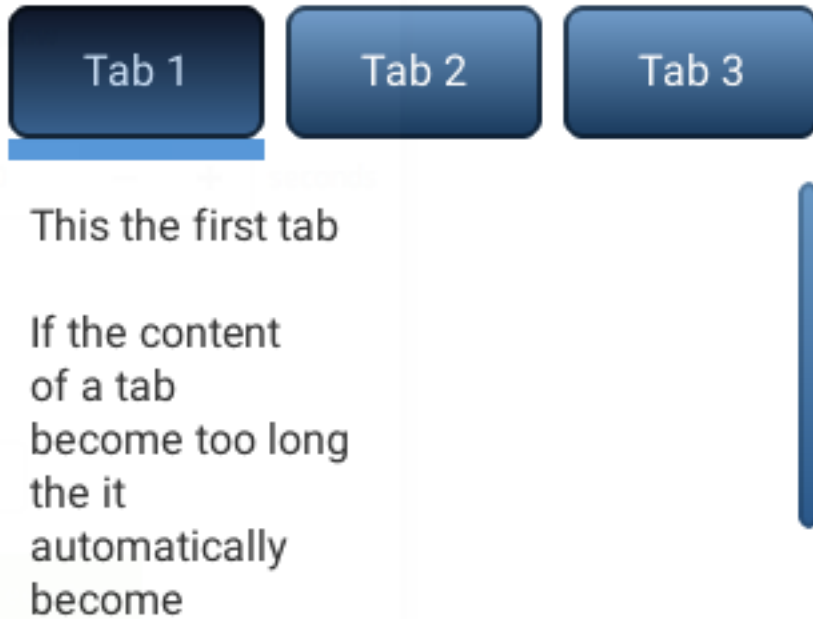
    /*Add content to the tabs*/
    lv_obj_t * label = lv_label_create(tab1, NULL);
    lv_label_set_text(label, "This the first tab\n\n"
        "If the content\n"
        "of a tab\n"
        "become too long\n"
        "the it \n"
        "automatically\n"
        "become\n"
        "scrollable.");

    label = lv_label_create(tab2, NULL);
    lv_label_set_text(label, "Second tab");

    label = lv_label_create(tab3, NULL);
    lv_label_set_text(label, "Third tab");
}
```

## MicroPython

### Simple Tabview



code

```
# Create a Tab view object
tabview = lv.tabview(lv.scr_act())

# Add 3 tabs (the tabs are page (lv_page) and can be scrolled)
tab1 = tabview.add_tab("Tab 1")
tab2 = tabview.add_tab("Tab 2")
tab3 = tabview.add_tab("Tab 3")

# Add content to the tabs
label = lv.label(tab1)
label.set_text("""This the first tab

If the content
of a tab
become too long
the it
automatically
become
scrollable.""")

label = lv.label(tab2)
label.set_text("Second tab")

label = lv.label(tab3)
label.set_text("Third tab")
```

## API

### Typedefs

**typedef** uint8\_t **lv\_tabview\_btns\_pos\_t**

**typedef** uint8\_t **lv\_tabview\_style\_t**

### Enums

**enum** [anonymous]

Position of tabview buttons.

*Values:*

**LV\_TABVIEW\_BTNS\_POS\_TOP**

**LV\_TABVIEW\_BTNS\_POS\_BOTTOM**

**LV\_TABVIEW\_BTNS\_POS\_LEFT**

**LV\_TABVIEW\_BTNS\_POS\_RIGHT**

**enum** [anonymous]

*Values:*

**LV\_TABVIEW\_STYLE\_BG**

**LV\_TABVIEW\_STYLE\_INDIC**

**LV\_TABVIEW\_STYLE\_BTN\_BG**

**LV\_TABVIEW\_STYLE\_BTN\_REL**

**LV\_TABVIEW\_STYLE\_BTN\_PR**

**LV\_TABVIEW\_STYLE\_BTN\_TGL\_REL**

**LV\_TABVIEW\_STYLE\_BTN\_TGL\_PR**

### Functions

*lv\_obj\_t* \***lv\_tabview\_create**(*lv\_obj\_t* \*par, **const** *lv\_obj\_t* \*copy)

Create a Tab view object

**Return** pointer to the created tab

**Parameters**

- **par**: pointer to an object, it will be the parent of the new tab
- **copy**: pointer to a tab object, if not NULL then the new object will be copied from it

**void** **lv\_tabview\_clean**(*lv\_obj\_t* \*tabview)

Delete all children of the scrl object, without deleting scrl child.

**Parameters**

- **tabview**: pointer to an object

*lv\_obj\_t* \***lv\_tabview\_add\_tab**(*lv\_obj\_t* \*tabview, **const** char \*name)

Add a new tab with the given name

**Return** pointer to the created page object (lv\_page). You can create your content here

#### Parameters

- **tabview**: pointer to Tab view object where to ass the new tab
- **name**: the text on the tab button

void **lv\_tabview\_set\_tab\_act**(*lv\_obj\_t* \*tabview, uint16\_t id, *lv\_anim\_enable\_t* anim)  
Set a new tab

#### Parameters

- **tabview**: pointer to Tab view object
- **id**: index of a tab to load
- **anim**: LV\_ANIM\_ON: set the value with an animation; LV\_ANIM\_OFF: change the value immediately

void **lv\_tabview\_set\_sliding**(*lv\_obj\_t* \*tabview, bool en)  
Enable horizontal sliding with touch pad

#### Parameters

- **tabview**: pointer to Tab view object
- **en**: true: enable sliding; false: disable sliding

void **lv\_tabview\_set\_anim\_time**(*lv\_obj\_t* \*tabview, uint16\_t anim\_time)  
Set the animation time of tab view when a new tab is loaded

#### Parameters

- **tabview**: pointer to Tab view object
- **anim\_time**: time of animation in milliseconds

void **lv\_tabview\_set\_style**(*lv\_obj\_t* \*tabview, *lv\_tabview\_style\_t* type, const *lv\_style\_t* \*style)  
Set the style of a tab view

#### Parameters

- **tabview**: pointer to a tan view object
- **type**: which style should be set
- **style**: pointer to the new style

void **lv\_tabview\_set\_btns\_pos**(*lv\_obj\_t* \*tabview, *lv\_tabview\_btns\_pos\_t* btns\_pos)  
Set the position of tab select buttons

#### Parameters

- **tabview**: pointer to a tab view object
- **btns\_pos**: which button position

void **lv\_tabview\_set\_btns\_hidden**(*lv\_obj\_t* \*tabview, bool en)  
Set whether tab buttons are hidden

#### Parameters

- **tabview**: pointer to a tab view object
- **en**: whether tab buttons are hidden

uint16\_t **lv\_tabview\_get\_tab\_act**(const *lv\_obj\_t* \*tabview)  
Get the index of the currently active tab



**Return** the active tab index

**Parameters**

- **tabview**: pointer to Tab view object

uint16\_t **lv\_tabview\_get\_tab\_count**(const lv\_obj\_t \*tabview)

Get the number of tabs

**Return** tab count

**Parameters**

- **tabview**: pointer to Tab view object

lv\_obj\_t \***lv\_tabview\_get\_tab**(const lv\_obj\_t \*tabview, uint16\_t id)

Get the page (content area) of a tab

**Return** pointer to page (lv\_page) object

**Parameters**

- **tabview**: pointer to Tab view object
- **id**: index of the tab (>= 0)

bool **lv\_tabview\_get\_sliding**(const lv\_obj\_t \*tabview)

Get horizontal sliding is enabled or not

**Return** true: enable sliding; false: disable sliding

**Parameters**

- **tabview**: pointer to Tab view object

uint16\_t **lv\_tabview\_get\_anim\_time**(const lv\_obj\_t \*tabview)

Get the animation time of tab view when a new tab is loaded

**Return** time of animation in milliseconds

**Parameters**

- **tabview**: pointer to Tab view object

const lv\_style\_t \***lv\_tabview\_get\_style**(const lv\_obj\_t \*tabview, lv\_tabview\_style\_t type)

Get a style of a tab view

**Return** style pointer to a style

**Parameters**

- **tabview**: pointer to a tab view object
- **type**: which style should be get

lv\_tabview\_btns\_pos\_t **lv\_tabview\_get\_btns\_pos**(const lv\_obj\_t \*tabview)

Get position of tab select buttons

**Parameters**

- **tabview**: pointer to a tab view object

bool **lv\_tabview\_get\_btns\_hidden**(const lv\_obj\_t \*tabview)

Get whether tab buttons are hidden

**Return** whether tab buttons are hidden

**Parameters**

- `tabview`: pointer to a tab view object

**struct lv\_tabview\_ext\_t**

#### Public Members

```

lv_obj_t *btns
lv_obj_t *indic
lv_obj_t *content
const char **tab_name_ptr
lv_point_t point_last
uint16_t tab_cur
uint16_t tab_cnt
uint16_t anim_time
uint8_t slide_enable
uint8_t dragging
uint8_t drag_hor
uint8_t scroll_ver
uint8_t btns_hide
lv_tabview_btns_pos_t btns_pos

```

### Zone de texte (lv\_ta)

#### Vue d' ensemble

The Text Area is a *Page* with a *Label* and a cursor on it. Texts or characters can be added to it. Long lines are wrapped and when the text becomes long enough the Text area can be scrolled-

#### Ajouter du texte

Vous pouvez insérer du texte ou des caractères à la position du curseur actuel avec :

- `lv_ta_add_char(ta, 'c')`
- `lv_ta_add_text(ta, "insert this text")`

Pour ajouter des caractères étendus comme 'á', 'ß' ou des caractères CJK utilisez `lv_ta_add_text(ta, "á")`.

`lv_ta_set_text(ta, "New text")` change le texte en totalité.

#### Substituf

Vous pouvez spécifier un texte de substitution qui s' affiche lorsque la zone de texte est vide avec `lv_ta_set_placeholder_text(ta, "Placeholder text")`

## Supprimer un caractère

Pour supprimer un caractère à gauche de la position actuelle du curseur, utilisez `lv_ta_del_char(ta)`. Pour supprimer à droite, utilisez `lv_ta_del_char_forward(ta)`.

## Déplacer le curseur

La position du curseur peut être modifiée directement avec `lv_ta_set_cursor_pos(ta, 10)`. La position 0 signifie “avant les premiers caractères”, `LV_TA_CURSOR_LAST` signifie “après le dernier caractère”.

Vous pouvez déplacer le curseur d’un caractère avec

- `lv_ta_cursor_right(ta)`
- `lv_ta_cursor_left(ta)`
- `lv_ta_cursor_up(ta)`
- `lv_ta_cursor_down(ta)`

Si `lv_ta_set_cursor_click_pos(ta, true)` est appelé le curseur se déplacera à la position où la zone de texte a été cliquée.

## Types de curseur

Il existe plusieurs types de curseur. Vous pouvez en choisir un avec : `lv_ta_set_cursor_type(ta, LV_CURSOR_...)`

- **LV\_CURSOR\_NONE** pas de curseur
- **LV\_CURSOR\_LINE** une simple ligne verticale
- **LV\_CURSOR\_BLOCK** un rectangle plein sur le caractère courant
- **LV\_CURSOR\_OUTLINE** une bordure rectangulaire autour du caractère courant
- **LV\_CURSOR\_UNDERLINE** souligne le caractère courant

Vous pouvez faire un ou logique de n’importe quel type de curseur avec `LV_CURSOR_HIDDEN` pour le masquer temporairement.

La durée de clignotement du curseur peut être réglée avec `lv_ta_set_cursor_blink_time(ta, time_ms)`.

## Mode une ligne

La zone de texte peut être configurée en mode une ligne avec `lv_ta_set_one_line(ta, true)`. Dans ce mode, la hauteur est calculée automatiquement pour afficher une seule ligne, les caractères de fin de ligne sont ignorés et le retour à la ligne est désactivé.

## Mode mot de passe

La zone de texte gère un mode de mot de passe qui peut être activé avec `lv_ta_set_pwd_mode(ta, true)`. En mode mot de passe, les caractères saisis sont convertis en \* après un certain temps ou lorsqu’un nouveau caractère est entré.

En mode mot de passe `lv_ta_get_text(ta)` donne le texte réel et non les astérisques.

La durée de visibilité peut être ajustée avec `lv_ta_set_pwd_show_time(ta, time_ms)`.

### Alignement du texte

Le texte peut être aligné à gauche, au milieu ou à droite avec `lv_label_set_align(label, LV_LABEL_ALIGN_LEFT/CENTER/RIGHT)`.

En mode une ligne, le texte ne peut défiler horizontalement que si le texte est aligné à gauche.

### Caractères autorisés

Vous pouvez définir une liste de caractères autorisés avec `lv_ta_set_accepted_chars(ta, "0123456789.+ -")`. Les autres caractères seront ignorés.

### Longueur de texte maximum.

Le nombre maximum de caractères peut être limité avec `lv_ta_set_max_length(ta, max_char_num)`

### Très long texte

S' il y a un texte très long dans la zone de texte (> 20000 caractères ) le défilement et l' affichage pourraient être lents. Cependant, en activant `LV_LABEL_LONG_TXT_HINT 1` dans *lv\_conf.h* cela peut être grandement amélioré. Cela enregistre des informations sur l' étiquette pour accélérer son affichage. En utilisant `LV_LABEL_LONG_TXT_HINT` le défilement et l' affichage sont aussi rapides qu' avec des textes courts "normaux" .

### Sélection de texte

Une partie du texte peut être sélectionnée si la fonctionnalité est activée avec `lv_ta_set_text_sel (ta, true)`. Cela fonctionne comme lorsque vous sélectionnez un texte sur votre PC avec votre souris.

### Barres de défilement

Les barres de défilement peuvent être affichées selon différentes stratégies définies par `lv_ta_set_sb_mode(ta, LV_SB_MODE_...)`. Apprenez-en plus sur l' objet [page](#).

### Propagation du défilement

Lorsque la zone de texte défile sur un autre objet défilant (comme une page) et que le défilement a atteint le bord de la zone de texte, le défilement peut être propagé au parent. En d' autres termes, lorsque la zone de texte ne peut continuer à défiler, le parent sera défilé à la place.

Cela peut être activé avec `lv_ta_set_scroll_propagation(ta, true)`.

Apprenez-en plus sur l' objet [page](#).

## Mise en évidence du bord

Lorsque vous faites défiler la zone de texte jusqu' à une bordure, l' animation d' un cercle peut être affichée si cela est activé avec `lv_ta_set_edge_flash(ta, true)`

## Styles

Utilisez `lv_ta_set_style(page, LV_TA_STYLE_..., &style)` pour définir un nouveau style pour un élément de la zone de texte :

- **LV\_TA\_STYLE\_BG** style de l' arrière-plan qui utilise toutes les propriétés `style.body`. L' étiquette utilise `style.label` de ce style (valeur par défaut : `lv_style_pretty`).
- **LV\_TA\_STYLE\_SB** style de la barre de défilement qui utilise toutes les propriétés `style.body` (valeur par défaut : `lv_style_pretty_color`).
- **LV\_TA\_STYLE\_CURSOR** style du curseur. Si NULL alors la librairie définit automatiquement un style en fonction de la couleur et de la police de l' étiquette.
  - **LV\_CURSOR\_LINE**: a `style.line.width` wide line but drawn as a rectangle as `style.body.padding.top/left` makes an offset on the cursor
  - **LV\_CURSOR\_BLOCK**: a rectangle as `style.body padding` makes the rectangle larger
  - **LV\_CURSOR\_OUTLINE**: an empty rectangle (just a border) as `style.body padding` makes the rectangle larger
  - **LV\_CURSOR\_UNDERLINE**: a `style.line.width` wide line but drawn as a rectangle as `style.body.padding.top/left` makes an offset on the cursor

## Événements

Outre les [événements génériques](/overview/event.html #evenements-generiques), les événements spéciaux suivants sont envoyés par la zone de texte :

- **LV\_EVENT\_INSERT** envoyé avant l' insertion d' un caractère. La donnée d' événement est le texte qu' il est prévu d' insérer. `lv_ta_set_insert_replace(ta, "New text")` remplace le texte à insérer. Le nouveau texte ne peut être une variable locale, détruite lorsque la fonction de rappel se termine. " " annule l' insertion.
- **LV\_EVENT\_VALUE\_CHANGED** envoyé quand le contenu de la zone de texte a été modifié.

## Touches

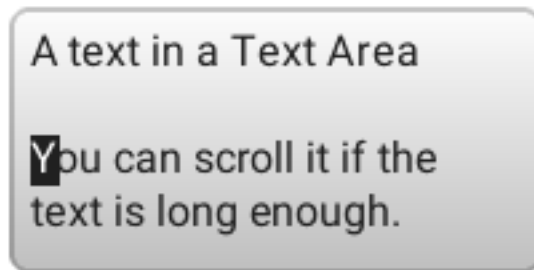
- **LV\_KEY\_UP/DOWN/LEFT/RIGHT** déplace le curseur
- **Tout caractère** insère le caractère à la position du curseur

Apprenez-en plus sur les *touches*.

## Exemple

### C

## Simple Text area



code

```
#include "lvgl/lvgl.h"
#include <stdio.h>

lv_obj_t * ta1;

static void event_handler(lv_obj_t * obj, lv_event_t event)
{
    if(event == LV_EVENT_VALUE_CHANGED) {
        printf("Value: %s\n", lv_ta_get_text(obj));
    }
    else if(event == LV_EVENT_LONG_PRESSED_REPEAT) {
        /*For simple test: Long press the Text are to add the text below*/
        const char * txt = "\n\nYou can scroll it if the text is long enough.\n";
        static uint16_t i = 0;
        if(txt[i] != '\0') {
            lv_ta_add_char(ta1, txt[i]);
            i++;
        }
    }
}

void lv_ex_ta_1(void)
{
    ta1 = lv_ta_create(lv_scr_act(), NULL);
    lv_obj_set_size(ta1, 200, 100);
    lv_obj_align(ta1, NULL, LV_ALIGN_CENTER, 0, 0);
    lv_ta_set_cursor_type(ta1, LV_CURSOR_BLOCK);
    lv_ta_set_text(ta1, "A text in a Text Area"); /*Set an initial text*/
    lv_obj_set_event_cb(ta1, event_handler);
}
```

Text are with password field

Password:

\*\*\*\*\*t

Text:

Hello



code

```
/**
 * @file lv_ex_tmpl.c
 *
 */

/*****
 * INCLUDES
 *****/
#include "lvgl/lvgl.h"
#include <stdio.h>

/*****
 * DEFINES
 *****/

/*****
 * TYPEDEFS
 *****/

/*****
 * STATIC PROTOTYPES
 *****/
static void kb_event_cb(lv_obj_t * event_kb, lv_event_t event);
static void ta_event_cb(lv_obj_t * ta, lv_event_t event);

/*****
 * STATIC VARIABLES
 *****/

static lv_obj_t * kb;
/*****/
```

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```

*      MACROS
*****/

/*****

*      GLOBAL FUNCTIONS
*****/

void lv_ex_ta_2(void)
{
    /* Create the password box */
    lv_obj_t * pwd_ta = lv_ta_create(lv_scr_act(), NULL);
    lv_ta_set_text(pwd_ta, "");
    lv_ta_set_pwd_mode(pwd_ta, true);
    lv_ta_set_one_line(pwd_ta, true);
    lv_obj_set_width(pwd_ta, LV_HOR_RES / 2 - 20);
    lv_obj_set_pos(pwd_ta, 5, 20);
    lv_obj_set_event_cb(pwd_ta, ta_event_cb);

    /* Create a label and position it above the text box */
    lv_obj_t * pwd_label = lv_label_create(lv_scr_act(), NULL);
    lv_label_set_text(pwd_label, "Password:");
    lv_obj_align(pwd_label, pwd_ta, LV_ALIGN_OUT_TOP_LEFT, 0, 0);

    /* Create the one-line mode text area */
    lv_obj_t * oneline_ta = lv_ta_create(lv_scr_act(), pwd_ta);
    lv_ta_set_pwd_mode(oneline_ta, false);
    lv_ta_set_cursor_type(oneline_ta, LV_CURSOR_LINE | LV_CURSOR_HIDDEN);
    lv_obj_align(oneline_ta, NULL, LV_ALIGN_IN_TOP_RIGHT, -5, 20);

    /* Create a label and position it above the text box */
    lv_obj_t * oneline_label = lv_label_create(lv_scr_act(), NULL);
    lv_label_set_text(oneline_label, "Text:");
    lv_obj_align(oneline_label, oneline_ta, LV_ALIGN_OUT_TOP_LEFT, 0, 0);

    /* Create a keyboard and make it fill the width of the above text areas */
    kb = lv_kb_create(lv_scr_act(), NULL);
    lv_obj_set_pos(kb, 5, 90);
    lv_obj_set_event_cb(kb, kb_event_cb); /* Setting a custom event handler stops the
↪ keyboard from closing automatically */
    lv_obj_set_size(kb, LV_HOR_RES - 10, 140);

    lv_kb_set_ta(kb, pwd_ta); /* Focus it on one of the text areas to start */
    lv_kb_set_cursor_manage(kb, true); /* Automatically show/hide cursors on text
↪ areas */
}

/*****

*      STATIC FUNCTIONS
*****/

static void kb_event_cb(lv_obj_t * event_kb, lv_event_t event)
{
    /* Just call the regular event handler */
    lv_kb_def_event_cb(event_kb, event);
}

```

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```

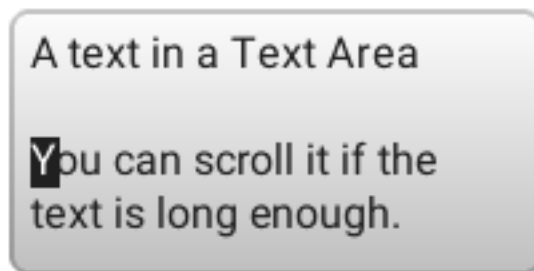
}
static void ta_event_cb(lv_obj_t * ta, lv_event_t event)
{
    if(event == LV_EVENT_CLICKED) {
        /* Focus on the clicked text area */
        if(kb != NULL)
            lv_kb_set_ta(kb, ta);
    }

    else if(event == LV_EVENT_INSERT) {
        const char * str = lv_event_get_data();
        if(str[0] == '\n') {
            printf("Ready\n");
        }
    }
}
}

```

## MicroPython

### Simple Text area



code

```

def event_handler(obj, event):
    if event == lv.EVENT.VALUE_CHANGED:
        print("Value: %s" % obj.get_text())
    elif event == lv.EVENT.LONG_PRESSED_REPEAT:
        # For simple test: Long press the Text are to add the text below
        ta1.add_text("\n\nYou can scroll it if the text is long enough.\n")

ta1 = lv.ta(lv.scr_act())

```

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```
ta1.set_size(200, 100)
ta1.align(None, lv.ALIGN.CENTER, 0, 0)
ta1.set_cursor_type(lv.CURSOR.BLOCK)
ta1.set_text("A text in a Text Area")      # Set an initial text
ta1.set_event_cb(event_handler)
```

Text are with password field

Password:

\*\*\*\*\*t

Text:

Hello



code

```
HOR_RES = lv.disp_get_hor_res(lv.disp_get_default())

def kb_event_cb(event_kb, event):
    # Just call the regular event handler
    event_kb.def_event_cb(event)

def ta_event_cb(ta, event):
    if event == lv.EVENT.INSERT:
        # get inserted value
        ptr = lv.C_Pointer()
        ptr.ptr_val = lv.event_get_data()
        if ptr.str_val == "\n":
            print("Ready")
    elif event == lv.EVENT.CLICKED:
        # Focus on the clicked text area
        kb.set_ta(ta)

# Create the password box
pwd_ta = lv.ta(lv.scr_act())
pwd_ta.set_text("");
pwd_ta.set_pwd_mode(True)
pwd_ta.set_one_line(True)
```

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```
pwd_ta.set_width(HOR_RES // 2 - 20)
pwd_ta.set_pos(5, 20)
pwd_ta.set_event_cb(ta_event_cb)

# Create a label and position it above the text box
pwd_label = lv.label(lv.scr_act())
pwd_label.set_text("Password:")
pwd_label.align(pwd_ta, lv.ALIGN.OUT_TOP_LEFT, 0, 0)

# Create the one-line mode text area
oneline_ta = lv.ta(lv.scr_act(), pwd_ta)
oneline_ta.set_pwd_mode(False)
oneline_ta.set_cursor_type(lv.CURSOR.LINE | lv.CURSOR.HIDDEN)
oneline_ta.align(None, lv.ALIGN.IN_TOP_RIGHT, -5, 20)
oneline_ta.set_event_cb(ta_event_cb)

# Create a label and position it above the text box
oneline_label = lv.label(lv.scr_act())
oneline_label.set_text("Text:")
oneline_label.align(oneline_ta, lv.ALIGN.OUT_TOP_LEFT, 0, 0)

# Create a keyboard and make it fill the width of the above text areas
kb = lv.kb(lv.scr_act())
kb.set_pos(5, 90)
kb.set_event_cb(kb_event_cb) # Setting a custom event handler stops the keyboard from
↪closing automatically
kb.set_size(HOR_RES - 10, 140)

kb.set_ta(pwd_ta) # Focus it on one of the text areas to start
kb.set_cursor_manage(True) # Automatically show/hide cursors on text areas
```

## API

### Typedefs

```
typedef uint8_t lv_cursor_type_t
```

```
typedef uint8_t lv_ta_style_t
```

### Enums

```
enum [anonymous]
    Style of text area' s cursor.
```

*Values:*

```
LV_CURSOR_NONE
```

No cursor

```
LV_CURSOR_LINE
```

Vertical line

```
LV_CURSOR_BLOCK
```

Rectangle

### **LV\_CURSOR\_OUTLINE**

Outline around character

### **LV\_CURSOR\_UNDERLINE**

Horizontal line under character

### **LV\_CURSOR\_HIDDEN = 0x08**

This flag can be ORed to any of the other values to temporarily hide the cursor

### **enum [anonymous]**

Possible text areas tyles.

*Values:*

### **LV\_TA\_STYLE\_BG**

Text area background style

### **LV\_TA\_STYLE\_SB**

Scrollbar style

### **LV\_TA\_STYLE\_CURSOR**

Cursor style

### **LV\_TA\_STYLE\_EDGE\_FLASH**

Edge flash style

### **LV\_TA\_STYLE\_PLACEHOLDER**

Placeholder style

## **Functions**

### **LV\_EXPORT\_CONST\_INT(LV\_TA\_CURSOR\_LAST)**

*lv\_obj\_t* \***lv\_ta\_create**(*lv\_obj\_t* \**par*, **const** *lv\_obj\_t* \**copy*)

Create a text area objects

**Return** pointer to the created text area

#### **Parameters**

- **par**: pointer to an object, it will be the parent of the new text area
- **copy**: pointer to a text area object, if not NULL then the new object will be copied from it

void **lv\_ta\_add\_char**(*lv\_obj\_t* \**ta*, uint32\_t *c*)

Insert a character to the current cursor position. To add a wide char, e.g. 'Á' use 'lv\_txt\_encoded\_conv\_wc( 'Á' )'

#### **Parameters**

- **ta**: pointer to a text area object
- **c**: a character (e.g. 'a' )

void **lv\_ta\_add\_text**(*lv\_obj\_t* \**ta*, **const** char \**txt*)

Insert a text to the current cursor position

#### **Parameters**

- **ta**: pointer to a text area object
- **txt**: a '\0' terminated string to insert

void **lv\_ta\_del\_char**(*lv\_obj\_t* \**ta*)

Delete a the left character from the current cursor position

#### Parameters

- **ta**: pointer to a text area object

void **lv\_ta\_del\_char\_forward**(*lv\_obj\_t* \*ta)  
Delete the right character from the current cursor position

#### Parameters

- **ta**: pointer to a text area object

void **lv\_ta\_set\_text**(*lv\_obj\_t* \*ta, **const** char \*txt)  
Set the text of a text area

#### Parameters

- **ta**: pointer to a text area
- **txt**: pointer to the text

void **lv\_ta\_set\_placeholder\_text**(*lv\_obj\_t* \*ta, **const** char \*txt)  
Set the placeholder text of a text area

#### Parameters

- **ta**: pointer to a text area
- **txt**: pointer to the text

void **lv\_ta\_set\_cursor\_pos**(*lv\_obj\_t* \*ta, int16\_t pos)  
Set the cursor position

#### Parameters

- **obj**: pointer to a text area object
- **pos**: the new cursor position in character index < 0 : index from the end of the text  
LV\_TA\_CURSOR\_LAST: go after the last character

void **lv\_ta\_set\_cursor\_type**(*lv\_obj\_t* \*ta, *lv\_cursor\_type\_t* cur\_type)  
Set the cursor type.

#### Parameters

- **ta**: pointer to a text area object
- **cur\_type**: element of 'lv\_cursor\_type\_t'

void **lv\_ta\_set\_cursor\_click\_pos**(*lv\_obj\_t* \*ta, bool en)  
Enable/Disable the positioning of the the cursor by clicking the text on the text area.

#### Parameters

- **ta**: pointer to a text area object
- **en**: true: enable click positions; false: disable

void **lv\_ta\_set\_pwd\_mode**(*lv\_obj\_t* \*ta, bool en)  
Enable/Disable password mode

#### Parameters

- **ta**: pointer to a text area object
- **en**: true: enable, false: disable

void **lv\_ta\_set\_one\_line**(*lv\_obj\_t* \*ta, bool en)  
Configure the text area to one line or back to normal

### Parameters

- **ta**: pointer to a Text area object
- **en**: true: one line, false: normal

void **lv\_ta\_set\_text\_align**(*lv\_obj\_t* \*ta, *lv\_label\_align\_t* align)

Set the alignment of the text area. In one line mode the text can be scrolled only with LV\_LABEL\_ALIGN\_LEFT. This function should be called if the size of text area changes.

### Parameters

- **ta**: pointer to a text are object
- **align**: the desired alignment from *lv\_label\_align\_t*. (LV\_LABEL\_ALIGN\_LEFT/CENTER/RIGHT)

void **lv\_ta\_set\_accepted\_chars**(*lv\_obj\_t* \*ta, const char \*list)

Set a list of characters. Only these characters will be accepted by the text area

### Parameters

- **ta**: pointer to Text Area
- **list**: list of characters. Only the pointer is saved. E.g. “+-.,0123456789”

void **lv\_ta\_set\_max\_length**(*lv\_obj\_t* \*ta, uint16\_t num)

Set max length of a Text Area.

### Parameters

- **ta**: pointer to Text Area
- **num**: the maximal number of characters can be added (*lv\_ta\_set\_text* ignores it)

void **lv\_ta\_set\_insert\_replace**(*lv\_obj\_t* \*ta, const char \*txt)

In LV\_EVENT\_INSERT the text which planned to be inserted can be replaced by an other text. It can be used to add automatic formatting to the text area.

### Parameters

- **ta**: pointer to a text area.
- **txt**: pointer to a new string to insert. If "" no text will be added. The variable must be live after the *event\_cb* exists. (Should be *global* or *static*)

static void **lv\_ta\_set\_sb\_mode**(*lv\_obj\_t* \*ta, *lv\_sb\_mode\_t* mode)

Set the scroll bar mode of a text area

### Parameters

- **ta**: pointer to a text area object
- **sb\_mode**: the new mode from ‘*lv\_page\_sb\_mode\_t*’ enum

static void **lv\_ta\_set\_scroll\_propagation**(*lv\_obj\_t* \*ta, bool en)

Enable the scroll propagation feature. If enabled then the Text area will move its parent if there is no more space to scroll.

### Parameters

- **ta**: pointer to a Text area
- **en**: true or false to enable/disable scroll propagation

static void **lv\_ta\_set\_edge\_flash**(*lv\_obj\_t* \*ta, bool en)

Enable the edge flash effect. (Show an arc when the an edge is reached)

#### Parameters

- **page**: pointer to a Text Area
- **en**: true or false to enable/disable end flash

void **lv\_ta\_set\_style**(*lv\_obj\_t* \*ta, *lv\_ta\_style\_t* type, **const** *lv\_style\_t* \*style)  
Set a style of a text area

#### Parameters

- **ta**: pointer to a text area object
- **type**: which style should be set
- **style**: pointer to a style

void **lv\_ta\_set\_text\_sel**(*lv\_obj\_t* \*ta, bool en)  
Enable/disable selection mode.

#### Parameters

- **ta**: pointer to a text area object
- **en**: true or false to enable/disable selection mode

void **lv\_ta\_set\_pwd\_show\_time**(*lv\_obj\_t* \*ta, uint16\_t time)  
Set how long show the password before changing it to ‘\*’

#### Parameters

- **ta**: pointer to Text area
- **time**: show time in milliseconds. 0: hide immediately.

void **lv\_ta\_set\_cursor\_blink\_time**(*lv\_obj\_t* \*ta, uint16\_t time)  
Set cursor blink animation time

#### Parameters

- **ta**: pointer to Text area
- **time**: blink period. 0: disable blinking

**const** char \***lv\_ta\_get\_text**(**const** *lv\_obj\_t* \*ta)  
Get the text of a text area. In password mode it gives the real text (not ‘\*’ s).

**Return** pointer to the text

#### Parameters

- **ta**: pointer to a text area object

**const** char \***lv\_ta\_get\_placeholder\_text**(*lv\_obj\_t* \*ta)  
Get the placeholder text of a text area

**Return** pointer to the text

#### Parameters

- **ta**: pointer to a text area object

*lv\_obj\_t* \***lv\_ta\_get\_label**(**const** *lv\_obj\_t* \*ta)  
Get the label of a text area

**Return** pointer to the label object

#### Parameters

- **ta**: pointer to a text area object

uint16\_t **lv\_ta\_get\_cursor\_pos**(const lv\_obj\_t \*ta)

Get the current cursor position in character index

**Return** the cursor position

**Parameters**

- **ta**: pointer to a text area object

lv\_cursor\_type\_t **lv\_ta\_get\_cursor\_type**(const lv\_obj\_t \*ta)

Get the current cursor type.

**Return** element of 'lv\_cursor\_type\_t'

**Parameters**

- **ta**: pointer to a text area object

bool **lv\_ta\_get\_cursor\_click\_pos**(lv\_obj\_t \*ta)

Get whether the cursor click positioning is enabled or not.

**Return** true: enable click positions; false: disable

**Parameters**

- **ta**: pointer to a text area object

bool **lv\_ta\_get\_pwd\_mode**(const lv\_obj\_t \*ta)

Get the password mode attribute

**Return** true: password mode is enabled, false: disabled

**Parameters**

- **ta**: pointer to a text area object

bool **lv\_ta\_get\_one\_line**(const lv\_obj\_t \*ta)

Get the one line configuration attribute

**Return** true: one line configuration is enabled, false: disabled

**Parameters**

- **ta**: pointer to a text area object

const char \***lv\_ta\_get\_accepted\_chars**(lv\_obj\_t \*ta)

Get a list of accepted characters.

**Return** list of accented characters.

**Parameters**

- **ta**: pointer to Text Area

uint16\_t **lv\_ta\_get\_max\_length**(lv\_obj\_t \*ta)

Set max length of a Text Area.

**Return** the maximal number of characters to be add

**Parameters**

- **ta**: pointer to Text Area

static lv\_sb\_mode\_t **lv\_ta\_get\_sb\_mode**(const lv\_obj\_t \*ta)

Get the scroll bar mode of a text area

**Return** scrollbar mode from 'lv\_page\_sb\_mode\_t' enum



#### Parameters

- **ta**: pointer to a text area object

**static** bool **lv\_ta\_get\_scroll\_propagation**(*lv\_obj\_t \*ta*)

Get the scroll propagation property

**Return** true or false

#### Parameters

- **ta**: pointer to a Text area

**static** bool **lv\_ta\_get\_edge\_flash**(*lv\_obj\_t \*ta*)

Get the scroll propagation property

**Return** true or false

#### Parameters

- **ta**: pointer to a Text area

**const** lv\_style\_t \***lv\_ta\_get\_style**(**const** *lv\_obj\_t \*ta*, *lv\_ta\_style\_t type*)

Get a style of a text area

**Return** style pointer to a style

#### Parameters

- **ta**: pointer to a text area object
- **type**: which style should be get

bool **lv\_ta\_text\_is\_selected**(**const** *lv\_obj\_t \*ta*)

Find whether text is selected or not.

**Return** whether text is selected or not

#### Parameters

- **ta**: Text area object

bool **lv\_ta\_get\_text\_sel\_en**(*lv\_obj\_t \*ta*)

Find whether selection mode is enabled.

**Return** true: selection mode is enabled, false: disabled

#### Parameters

- **ta**: pointer to a text area object

uint16\_t **lv\_ta\_get\_pwd\_show\_time**(*lv\_obj\_t \*ta*)

Set how long show the password before changing it to ‘\*’

**Return** show time in milliseconds. 0: hide immediately.

#### Parameters

- **ta**: pointer to Text area

uint16\_t **lv\_ta\_get\_cursor\_blink\_time**(*lv\_obj\_t \*ta*)

Set cursor blink animation time

**Return** time blink period. 0: disable blinking

#### Parameters

- **ta**: pointer to Text area

void **lv\_ta\_clear\_selection**(*lv\_obj\_t \*ta*)  
 Clear the selection on the text area.

**Parameters**

- **ta**: Text area object

void **lv\_ta\_cursor\_right**(*lv\_obj\_t \*ta*)  
 Move the cursor one character right

**Parameters**

- **ta**: pointer to a text area object

void **lv\_ta\_cursor\_left**(*lv\_obj\_t \*ta*)  
 Move the cursor one character left

**Parameters**

- **ta**: pointer to a text area object

void **lv\_ta\_cursor\_down**(*lv\_obj\_t \*ta*)  
 Move the cursor one line down

**Parameters**

- **ta**: pointer to a text area object

void **lv\_ta\_cursor\_up**(*lv\_obj\_t \*ta*)  
 Move the cursor one line up

**Parameters**

- **ta**: pointer to a text area object

**struct lv\_ta\_ext\_t**

**Public Members**

*lv\_page\_ext\_t* **page**

*lv\_obj\_t* \***label**

*lv\_obj\_t* \***placeholder**

char \***pwd\_tmp**

**const** char \***accapted\_chars**

uint16\_t **max\_length**

uint16\_t **pwd\_show\_time**

**const** lv\_style\_t \***style**

lv\_coord\_t **valid\_x**

uint16\_t **pos**

uint16\_t **blink\_time**

lv\_area\_t **area**

uint16\_t **txt\_byte\_pos**

*lv\_cursor\_type\_t* **type**

uint8\_t **state**

```
uint8_t click_pos
struct lv_ta_ext_t::[anonymous] cursor
lv_draw_label_txt_sel_t sel
uint8_t text_sel_in_prog
uint8_t text_sel_en
uint8_t pwd_mode
uint8_t one_line
```

## Mosaïque (lv\_tileview)

### Vue d' ensemble

La mosaïque est un objet conteneur dans lequel ses éléments, appelés *tuiles*, peuvent être organisés sous forme de grille. En balayant l' utilisateur peut naviguer entre les tuiles.

Si la mosaïque est de la taille de l' écran, elle fournit une interface utilisateur que vous avez peut-être vue sur les montres intelligentes.

### Positions valides

Les tuiles ne doivent pas nécessairement former une grille complète où chaque élément existe. La grille peut comporter des trous, mais elle doit être continue, c' est-à-dire qu' il ne peut y avoir une ligne ou une colonne vide.

Avec `lv_tileview_set_valid_positions(tileview, valid_pos_array, array_len)`, les positions valides peuvent être définies. Le défilement ne sera possible que vers ces positions. L' indice `0,0` représente la tuile en haut à gauche. Par exemple `lv_point_t valid_pos_array [] = { { 0, 0 }, { 0, 1 }, { 1, 1 }, { LV_COORD_MIN, LV_COORD_MIN } }` donne une mosaïque en forme de “L”. Cela indique qu' il n' y a pas de tuile dans `{ 1,0 }` et que l' utilisateur ne peut donc pas s' y déplacer.

En d' autres termes, `valid_pos_array` indique où se trouvent les tuiles. Il peut être modifié à la volée pour désactiver certaines positions pour des tuiles spécifiques. Par exemple, il peut exister une grille 2 x 2 où toutes les tuiles sont présentes, où la première ligne ( $y = 0$ ) est la “ligne principale” et la deuxième ligne ( $y = 1$ ) contient des options pour la tuile située au-dessus. Supposons que le défilement horizontal est possible uniquement dans la ligne principale et impossible entre les options de la deuxième ligne. Dans ce cas, `valid_pos_array` doit être modifié lorsqu' une nouvelle tuile principale est sélectionnée :

- pour la première tuile principale : `{ 0, 0 }, { 0, 1 }, { 1, 0 }` pour désactiver la tuile d' option `{ 1, 1 }`
- pour la deuxième tuile principale : `{ 0, 0 }, { 0, 1 }, { 1, 1 }` pour désactiver la tuile d' option `{ 0, 1 }`

### Ajouter un élément

Pour ajouter des éléments, il suffit de créer un objet sur la mosaïque et d' appeler `lv_tileview_add_element(tileview, element)`.

L' élément doit avoir la même taille que la mosaïque et doit être positionné manuellement à la position souhaitée.

La fonctionnalité de propagation de défilement des objets de type page (comme *liste*) peut très bien être utilisée ici. Par exemple, l'utilisateur peut faire défiler les éléments d'une liste et quand le premier ou le dernier élément de la liste est atteint, c'est la mosaïque qui défile à la place.

`lv_tileview_add_element(tileview, element)` devrait être utilisé pour permettre de faire défiler (glisser) la mosaïque par un de ces éléments. Par exemple, s'il y a un bouton sur une tuile, le bouton doit être explicitement ajouté à la mosaïque pour permettre à l'utilisateur de faire défiler la mosaïque avec le bouton.

Cela vaut aussi pour les boutons d'une *liste*. Chaque bouton de la liste et la liste elle-même doivent être ajoutés avec `lv_tileview_add_element`.

### Définir la tuile

Pour définir la tuile visible, utilisez `lv_tileview_set_tile_act tileview, x_id, y_id, LV_ANIM_ON/OFF`).

### Durée d'animation

La durée d'animation quand une tuile

- est sélectionnée par `lv_tileview_set_tile_act`
- est légèrement déplacé, puis relâché (revient à la tuile d'origine)
- est déplacé sur plus de la moitié de sa taille, puis relâché (affiche la tuile suivante)

peut être fixée avec `lv_tileview_set_anim_time(tileview, anim_time)`.

### Mise en évidence du bord

Un effet de "mise en évidence du bord" peut être ajouté lorsque la mosaïque atteint une position non valide ou une des extrémités lors du défilement.

Utilisez `lv_tileview_set_edge_flash(tileview, true)` pour activer cette fonctionnalité.

### Styles

La mosaïque a un seul style qui peut être changé avec `lv_tileview_set_style(slider, LV_TILEVIEW_STYLE_MAIN, &style)`.

- **LV\_TILEVIEW\_STYLE\_MAIN** style de l'arrière plan. Toutes les propriétés `style.body` sont utilisées.

### Événements

Outre les [événements génériques](/overview/event.html #evenements-generiques), les événements spéciaux suivants sont envoyés par la mosaïque :

- **LV\_EVENT\_VALUE\_CHANGED** envoyé quand une nouvelle tuile est affichée par défilement ou appel de la fonction `lv_tileview_set_act`. Les données d'événement sont définies sur l'index de la nouvelle tuile dans `valid_pos_array` (le type est `uint32_t *`).

## Touches

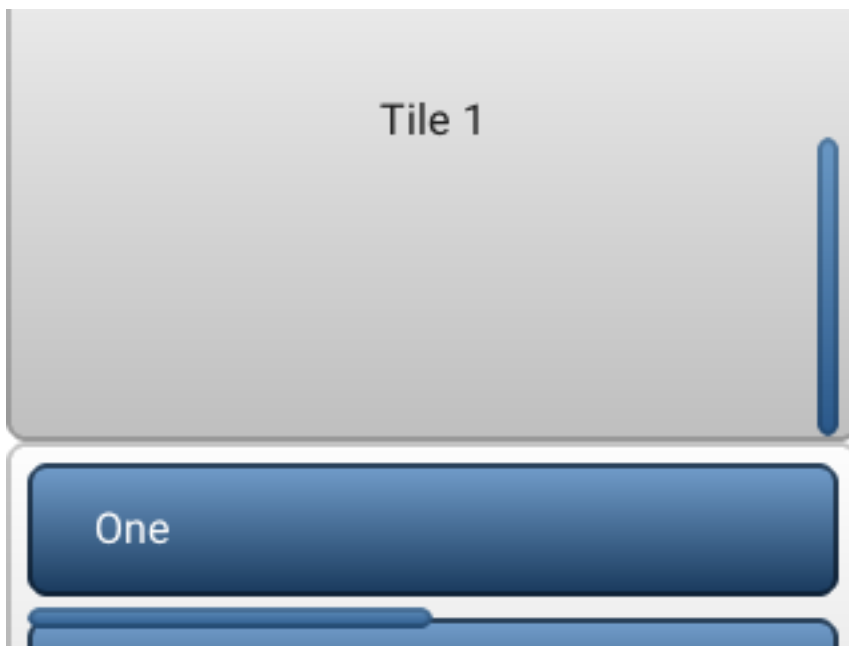
- **LV\_KEY\_UP**, **LV\_KEY\_RIGHT** incrémente l' index de la tuile de 1.
- **LV\_KEY\_DOWN**, **LV\_KEY\_LEFT** décrémente l' index de la tuile de 1.

Apprenez-en plus sur les *touches*.

## Exemple

### C

#### Tileview with content



code

```
#include "lvgl/lvgl.h"

void lv_ex_tileview_1(void)
{
    static lv_point_t valid_pos[] = {{0,0}, {0, 1}, {1,1}};
    lv_obj_t *tileview;
    tileview = lv_tileview_create(lv_scr_act(), NULL);
    lv_tileview_set_valid_positions(tileview, valid_pos, 3);
    lv_tileview_set_edge_flash(tileview, true);

    lv_obj_t * tile1 = lv_obj_create(tileview, NULL);
    lv_obj_set_size(tile1, LV_HOR_RES, LV_VER_RES);
    lv_obj_set_style(tile1, &lv_style_pretty);
    lv_tileview_add_element(tileview, tile1);

    /*Tile1: just a label*/
    lv_obj_t * label = lv_label_create(tile1, NULL);
```

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```
lv_label_set_text(label, "Tile 1");
lv_obj_align(label, NULL, LV_ALIGN_CENTER, 0, 0);

/*Tile2: a list*/
lv_obj_t * list = lv_list_create(tileview, NULL);
lv_obj_set_size(list, LV_HOR_RES, LV_VER_RES);
lv_obj_set_pos(list, 0, LV_VER_RES);
lv_list_set_scroll_propagation(list, true);
lv_list_set_sb_mode(list, LV_SB_MODE_OFF);
lv_tileview_add_element(tileview, list);

lv_obj_t * list_btn;
list_btn = lv_list_add_btn(list, NULL, "One");
lv_tileview_add_element(tileview, list_btn);

list_btn = lv_list_add_btn(list, NULL, "Two");
lv_tileview_add_element(tileview, list_btn);

list_btn = lv_list_add_btn(list, NULL, "Three");
lv_tileview_add_element(tileview, list_btn);

list_btn = lv_list_add_btn(list, NULL, "Four");
lv_tileview_add_element(tileview, list_btn);

list_btn = lv_list_add_btn(list, NULL, "Five");
lv_tileview_add_element(tileview, list_btn);

list_btn = lv_list_add_btn(list, NULL, "Six");
lv_tileview_add_element(tileview, list_btn);

list_btn = lv_list_add_btn(list, NULL, "Seven");
lv_tileview_add_element(tileview, list_btn);

list_btn = lv_list_add_btn(list, NULL, "Eight");
lv_tileview_add_element(tileview, list_btn);

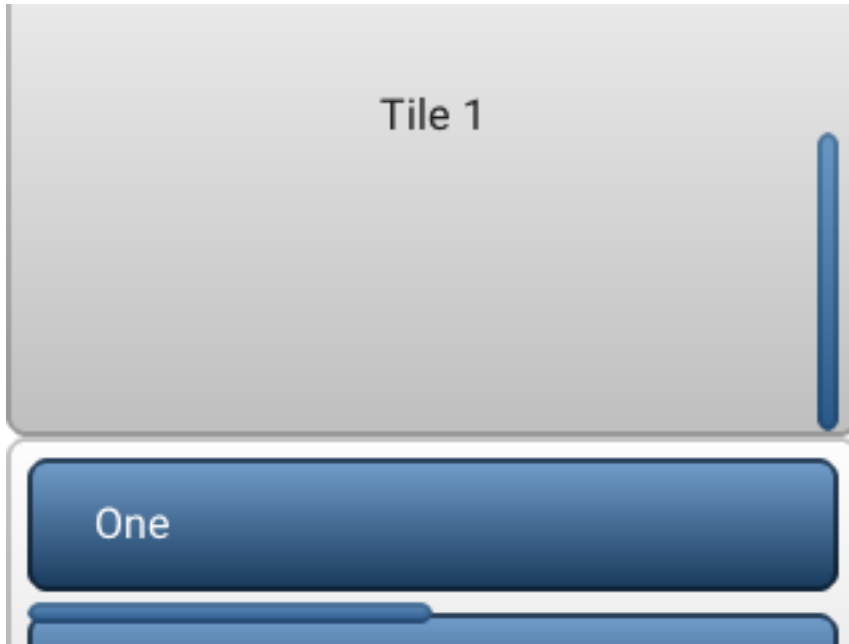
/*Tile3: a button*/
lv_obj_t * tile3 = lv_obj_create(tileview, tile1);
lv_obj_set_pos(tile3, LV_HOR_RES, LV_VER_RES);
lv_tileview_add_element(tileview, tile3);

lv_obj_t * btn = lv_btn_create(tile3, NULL);
lv_obj_align(btn, NULL, LV_ALIGN_CENTER, 0, 0);

label = lv_label_create(btn, NULL);
lv_label_set_text(label, "Button");
}
```

## MicroPython

### Tileview with content



code

```
valid_pos = [{"x":0, "y": 0}, {"x": 0, "y": 1}, {"x": 1,"y": 1}]

# resolution of the screen
HOR_RES = lv.disp_get_hor_res(lv.disp_get_default())
VER_RES = lv.disp_get_ver_res(lv.disp_get_default())

tileview = lv.tileview(lv.scr_act())
tileview.set_valid_positions(valid_pos, len(valid_pos))
tileview.set_edge_flash(True)

tile1 = lv.obj(tileview)
tile1.set_size(HOR_RES, VER_RES)
tile1.set_style(lv.style_pretty)
tileview.add_element(tile1)

# Tile1: just a label
label = lv.label(tile1)
label.set_text("Tile 1")
label.align(None, lv.ALIGN.CENTER, 0, 0)

# Tile2: a list
lst = lv.list(tileview)
lst.set_size(HOR_RES, VER_RES)
lst.set_pos(0, VER_RES)
lst.set_scroll_propagation(True)
lst.set_sb_mode(lv.SB_MODE.OFF)
tileview.add_element(lst)

list_btn = lst.add_btn(None, "One")
tileview.add_element(list_btn)
```

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```
list_btn = lst.add_btn(None, "Two")
tileview.add_element(list_btn)

list_btn = lst.add_btn(None, "Three")
tileview.add_element(list_btn)

list_btn = lst.add_btn(None, "Four")
tileview.add_element(list_btn)

list_btn = lst.add_btn(None, "Five")
tileview.add_element(list_btn)

list_btn = lst.add_btn(None, "Six")
tileview.add_element(list_btn)

list_btn = lst.add_btn(None, "Seven")
tileview.add_element(list_btn)

list_btn = lst.add_btn(None, "Eight")
tileview.add_element(list_btn)

# Tile3: a button
tile3 = lv.obj(tileview, tile1)
tile3.set_pos(HOR_RES, VER_RES)
tileview.add_element(tile3)

btn = lv.btn(tile3)
btn.align(None, lv.ALIGN.CENTER, 0, 0)

label = lv.label(btn)
label.set_text("Button")
```

## API

### Typedefs

**typedef** uint8\_t **lv\_tileview\_style\_t**

### Enums

**enum** [anonymous]

*Values:*

**LV\_TILEVIEW\_STYLE\_MAIN**

### Functions

*lv\_obj\_t* \***lv\_tileview\_create**(*lv\_obj\_t* \*par, const *lv\_obj\_t* \*copy)

Create a tileview objects

**Return** pointer to the created tileview

**Parameters**



- **par**: pointer to an object, it will be the parent of the new tileview
- **copy**: pointer to a tileview object, if not NULL then the new object will be copied from it

void **lv\_tileview\_add\_element**(*lv\_obj\_t* \*tileview, *lv\_obj\_t* \*element)

Register an object on the tileview. The register object will be able to slide the tileview

#### Parameters

- **tileview**: pointer to a Tileview object
- **element**: pointer to an object

void **lv\_tileview\_set\_valid\_positions**(*lv\_obj\_t* \*tileview, **const** *lv\_point\_t* valid\_pos[],  
uint16\_t valid\_pos\_cnt)

Set the valid position's indices. The scrolling will be possible only to these positions.

#### Parameters

- **tileview**: pointer to a Tileview object
- **valid\_pos**: array with the indices. E.g. *lv\_point\_t* p[] = {{0,0}, {1,0}, {1,1}}. Only the pointer is saved so can't be a local variable.
- **valid\_pos\_cnt**: number of elements in **valid\_pos** array

void **lv\_tileview\_set\_tile\_act**(*lv\_obj\_t* \*tileview, *lv\_coord\_t* x, *lv\_coord\_t* y,  
*lv\_anim\_enable\_t* anim)

Set the tile to be shown

#### Parameters

- **tileview**: pointer to a tileview object
- **x**: column id (0, 1, 2...)
- **y**: line id (0, 1, 2...)
- **anim**: LV\_ANIM\_ON: set the value with an animation; LV\_ANIM\_OFF: change the value immediately

**static** void **lv\_tileview\_set\_edge\_flash**(*lv\_obj\_t* \*tileview, bool en)

Enable the edge flash effect. (Show an arc when the an edge is reached)

#### Parameters

- **tileview**: pointer to a Tileview
- **en**: true or false to enable/disable end flash

**static** void **lv\_tileview\_set\_anim\_time**(*lv\_obj\_t* \*tileview, uint16\_t anim\_time)

Set the animation time for the Tile view

#### Parameters

- **tileview**: pointer to a page object
- **anim\_time**: animation time in milliseconds

void **lv\_tileview\_set\_style**(*lv\_obj\_t* \*tileview, *lv\_tileview\_style\_t* type, **const** *lv\_style\_t* \*style)

Set a style of a tileview.

#### Parameters

- **tileview**: pointer to tileview object
- **type**: which style should be set

- **style**: pointer to a style

**static** bool **lv\_tileview\_get\_edge\_flash**(*lv\_obj\_t* \*tileview)

Get the scroll propagation property

**Return** true or false

**Parameters**

- **tileview**: pointer to a Tileview

**static** uint16\_t **lv\_tileview\_get\_anim\_time**(*lv\_obj\_t* \*tileview)

Get the animation time for the Tile view

**Return** animation time in milliseconds

**Parameters**

- **tileview**: pointer to a page object

**const** lv\_style\_t \***lv\_tileview\_get\_style**(**const** *lv\_obj\_t* \*tileview, *lv\_tileview\_style\_t* type)

Get style of a tileview.

**Return** style pointer to the style

**Parameters**

- **tileview**: pointer to tileview object
- **type**: which style should be get

**struct** lv\_tileview\_ext\_t

### Public Members

*lv\_page\_ext\_t* **page**

**const** lv\_point\_t \***valid\_pos**

uint16\_t **valid\_pos\_cnt**

uint16\_t **anim\_time**

lv\_point\_t **act\_id**

uint8\_t **drag\_top\_en**

uint8\_t **drag\_bottom\_en**

uint8\_t **drag\_left\_en**

uint8\_t **drag\_right\_en**

uint8\_t **drag\_hor**

uint8\_t **drag\_ver**

### Fenêtre (lv\_win)

#### Vue d' ensemble

Les fenêtres sont l' un des objets les plus complexes du type conteneur. Ils sont construits à partir de deux parties principales :

1. un en-tête *conteneur* en haut
2. une *page* pour le contenu situé sous l' en-tête.

## Titre

Sur l' en-tête, il y a un titre qui peut être modifié par : `lv_win_set_title(win, "Nouveau titre")`. Le titre hérite toujours du style de l' en-tête.

## Boutons de contrôle

Vous pouvez ajouter des boutons de contrôle à la droite de l' en-tête avec : `lv_win_add_btn(win, LV_SYMBOL_CLOSE)`. Le deuxième paramètre est une *image* source.

`lv_win_close_event_cb` peut être utilisé comme fonction de rappel d'événement pour fermer la fenêtre.

Vous pouvez modifier la taille des boutons de contrôle avec la fonction `lv_win_set_btn_size(win, new_size)`.

## Barres de défilement

Le comportement de la barre de défilement peut être défini par `lv_win_set_sb_mode(win, LV_SB_MODE _...)`. Voir [\[page\]\(/object-types/page\)](#) pour plus de détails.

## Défilement manuel et focus

Pour faire défiler la fenêtre directement, vous pouvez utiliser `lv_win_scroll_hor(win, dist_px)` ou `lv_win_scroll_ver(win, dist_px)`.

Pour que la fenêtre affiche un de ses objets, utilisez `lv_win_focus (win, child, LV_ANIM_ON/OFF)`.

La durée des animations de défilement et de focus peut être ajusté avec `lv_win_set_anim_time(win, anim_time_ms)`.

## Mise en page

Pour définir une disposition du contenu, utilisez `lv_win_set_layout (win, LV_LAYOUT_...)`. Voir *conteneur* pour plus de détails.

## Styles

Utilisez `lv_win_set_style(win, LV_WIN_STYLE_..., &style)` pour définir un nouveau style pour un élément de la fenêtre :

- **LV\_WIN\_STYE\_BG** arrière-plan principal (l' en-tête et la page de contenu sont placés dessus) qui utilise toutes les propriétés `style.body` (valeur par défaut : `lv_style_plain`)
- **LV\_WIN\_STYLE\_CONTENT** partie déroulante de la page de contenu qui utilise toutes les propriétés `style.body` (valeur par défaut : `lv_style_transp`)

- **LV\_WIN\_STYLE\_SB** le style de la barre de défilement qui utilise toutes les propriétés **style.body**. **body.padding.left/top** définit les marges des barres de défilement et **body.inner.padding** définit la largeur de la barre de défilement (valeur par défaut: **lv\_style\_pretty\_color**)
- **LV\_WIN\_STYLE\_HEADER** style de l' en-tête qui utilise toutes les propriétés **style.body** (valeur par défaut : **lv\_style\_plain\_color**)
- **LV\_WIN\_STYLE\_BTN\_REL** style du bouton relâché (sur l' en-tête) qui utilise toutes les propriétés **style.body** (valeur par défaut : **lv\_style\_btn\_rel**)
- **LV\_WIN\_STYLE\_BTN\_PR** style du bouton pressé (sur l' en-tête) qui utilise toutes les propriétés **style.body** (valeur par défaut : **lv\_style\_btn\_pr**)

La hauteur de l' en-tête est définie par la plus grande valeur de *hauteur des boutons* (définie par **lv\_win\_set\_btn\_size**) et *hauteur de titre* (provenant de **header\_style.text.font**), plus les éléments **body.padding.top** et **body.padding.bottom** du style de l' en-tête.

## Événements

Seuls les *événements génériques* sont envoyés par ce type d' objet.

Apprenez-en plus sur les *événements*.

## Touches

Les *touches* suivantes sont traitées par la page :

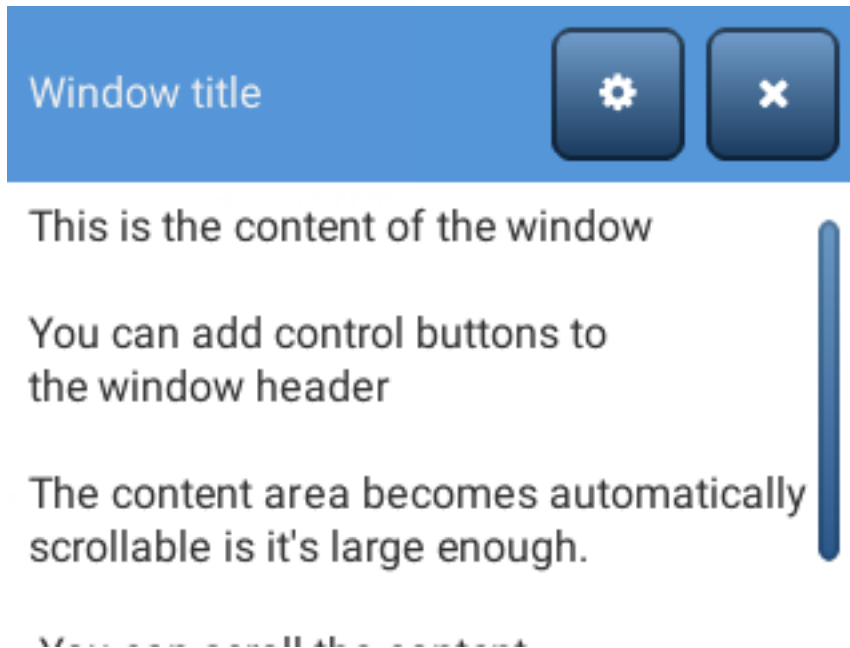
- **LV\_KEY\_RIGHT/LEFT/UP/DOWN** font défiler la page

Apprenez-en plus sur les *touches*.

## Exemple

C

## Simple window



code

```
#include "lvgl/lvgl.h"

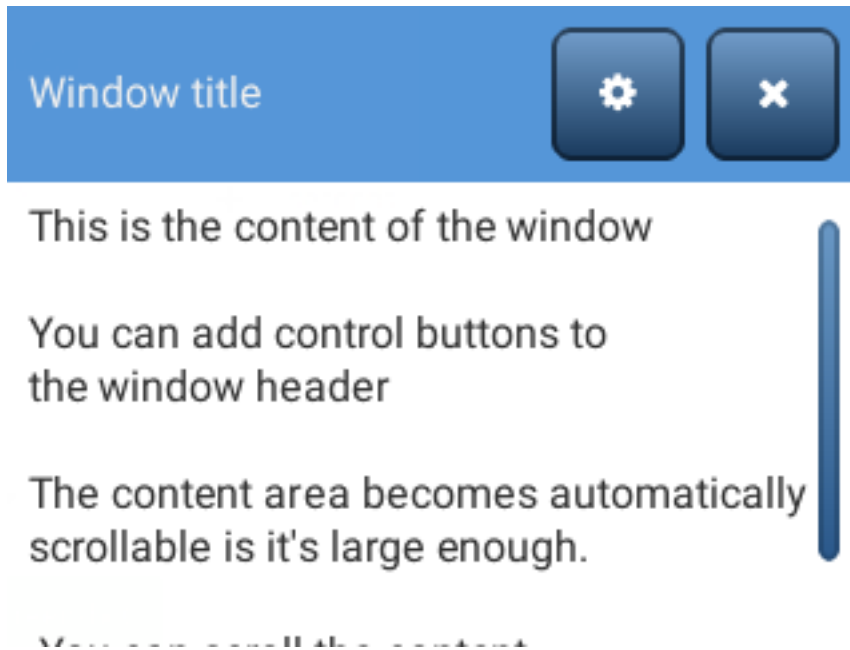
void lv_ex_win_1(void)
{
    /*Create a window*/
    lv_obj_t * win = lv_win_create(lv_scr_act(), NULL);
    lv_win_set_title(win, "Window title");           /*Set the title*/

    /*Add control button to the header*/
    lv_obj_t * close_btn = lv_win_add_btn(win, LV_SYMBOL_CLOSE);           /*Add
↪close button and use built-in close action*/
    lv_obj_set_event_cb(close_btn, lv_win_close_event_cb);
    lv_win_add_btn(win, LV_SYMBOL_SETTINGS);         /*Add a setup button*/

    /*Add some dummy content*/
    lv_obj_t * txt = lv_label_create(win, NULL);
    lv_label_set_text(txt, "This is the content of the window\n\n"
                           "You can add control buttons to\n"
                           "the window header\n\n"
                           "The content area becomes automatically\n"
                           "scrollable is it's large enough.\n\n"
                           " You can scroll the content\n"
                           "See the scroll bar on the right!");
}
```

## MicroPython

## Simple window



code

```
# Create a window
win = lv.win(lv.scr_act())
win.set_title("Window title")                                # Set the title

# Add control button to the header
close_btn = win.add_btn(lv.SYMBOL.CLOSE)                    # Add close button and use built-in
↳close action
close_btn.set_event_cb(lv.win.close_event_cb)
win.add_btn(lv.SYMBOL.SETTINGS)                              # Add a setup button

# Add some dummy content
txt = lv.label(win)
txt.set_text(
    """This is the content of the window

    You can add control buttons to
    the window header

    The content area becomes automatically
    scrollable is it's large enough.

    You can scroll the content
    See the scroll bar on the right!"""
)
```

## API

## Typedefs

```
typedef uint8_t lv_win_style_t
```

## Enums

```
enum [anonymous]  
Window styles.
```

*Values:*

```
LV_WIN_STYLE_BG  
Window object background style.  
LV_WIN_STYLE_CONTENT  
Window content style.  
LV_WIN_STYLE_SB  
Window scrollbar style.  
LV_WIN_STYLE_HEADER  
Window titlebar background style.  
LV_WIN_STYLE_BTN_REL  
Same meaning as ordinary button styles.  
LV_WIN_STYLE_BTN_PR
```

## Functions

```
lv_obj_t *lv_win_create(lv_obj_t *par, const lv_obj_t *copy)  
Create a window objects
```

**Return** pointer to the created window

### Parameters

- **par**: pointer to an object, it will be the parent of the new window
- **copy**: pointer to a window object, if not NULL then the new object will be copied from it

```
void lv_win_clean(lv_obj_t *win)  
Delete all children of the scr1 object, without deleting scr1 child.
```

### Parameters

- **win**: pointer to an object

```
lv_obj_t *lv_win_add_btn(lv_obj_t *win, const void *img_src)  
Add control button to the header of the window
```

**Return** pointer to the created button object

### Parameters

- **win**: pointer to a window object
- **img\_src**: an image source ( 'lv\_img\_t' variable, path to file or a symbol)

```
void lv_win_close_event_cb(lv_obj_t *btn, lv_event_t event)  
Can be assigned to a window control button to close the window
```

### Parameters

- **btn**: pointer to the control button on teh widows header
- **evet**: the event type

void **lv\_win\_set\_title**(*lv\_obj\_t \*win*, **const** char \**title*)  
Set the title of a window

**Parameters**

- **win**: pointer to a window object
- **title**: string of the new title

void **lv\_win\_set\_btn\_size**(*lv\_obj\_t \*win*, lv\_coord\_t *size*)  
Set the control button size of a window

**Return** control button size

**Parameters**

- **win**: pointer to a window object

void **lv\_win\_set\_content\_size**(*lv\_obj\_t \*win*, lv\_coord\_t *w*, lv\_coord\_t *h*)  
Set the size of the content area.

**Parameters**

- **win**: pointer to a window object
- **w**: width
- **h**: height (the window will be higher with the height of the header)

void **lv\_win\_set\_layout**(*lv\_obj\_t \*win*, *lv\_layout\_t layout*)  
Set the layout of the window

**Parameters**

- **win**: pointer to a window object
- **layout**: the layout from 'lv\_layout\_t'

void **lv\_win\_set\_sb\_mode**(*lv\_obj\_t \*win*, *lv\_sb\_mode\_t sb\_mode*)  
Set the scroll bar mode of a window

**Parameters**

- **win**: pointer to a window object
- **sb\_mode**: the new scroll bar mode from 'lv\_sb\_mode\_t'

void **lv\_win\_set\_anim\_time**(*lv\_obj\_t \*win*, uint16\_t *anim\_time*)  
Set focus animation duration on *lv\_win\_focus()*

**Parameters**

- **win**: pointer to a window object
- **anim\_time**: duration of animation [ms]

void **lv\_win\_set\_style**(*lv\_obj\_t \*win*, *lv\_win\_style\_t type*, **const** lv\_style\_t \**style*)  
Set a style of a window

**Parameters**

- **win**: pointer to a window object
- **type**: which style should be set



- **style**: pointer to a style

void **lv\_win\_set\_drag**(*lv\_obj\_t* \*win, bool en)

Set drag status of a window. If set to ‘true’ window can be dragged like on a PC.

**Parameters**

- **win**: pointer to a window object
- **en**: whether dragging is enabled

const char \***lv\_win\_get\_title**(const *lv\_obj\_t* \*win)

Get the title of a window

**Return** title string of the window

**Parameters**

- **win**: pointer to a window object

*lv\_obj\_t* \***lv\_win\_get\_content**(const *lv\_obj\_t* \*win)

Get the content holder object of window (**lv\_page**) to allow additional customization

**Return** the Page object where the window’s content is

**Parameters**

- **win**: pointer to a window object

*lv\_coord\_t* **lv\_win\_get\_btn\_size**(const *lv\_obj\_t* \*win)

Get the control button size of a window

**Return** control button size

**Parameters**

- **win**: pointer to a window object

*lv\_obj\_t* \***lv\_win\_get\_from\_btn**(const *lv\_obj\_t* \*ctrl\_btn)

Get the pointer of a widow from one of its control button. It is useful in the action of the control buttons where only button is known.

**Return** pointer to the window of ‘ctrl\_btn’

**Parameters**

- **ctrl\_btn**: pointer to a control button of a window

*lv\_layout\_t* **lv\_win\_get\_layout**(*lv\_obj\_t* \*win)

Get the layout of a window

**Return** the layout of the window (from ‘lv\_layout\_t’ )

**Parameters**

- **win**: pointer to a window object

*lv\_sb\_mode\_t* **lv\_win\_get\_sb\_mode**(*lv\_obj\_t* \*win)

Get the scroll bar mode of a window

**Return** the scroll bar mode of the window (from ‘lv\_sb\_mode\_t’ )

**Parameters**

- **win**: pointer to a window object

uint16\_t **lv\_win\_get\_anim\_time**(const *lv\_obj\_t* \*win)

Get focus animation duration

**Return** duration of animation [ms]

**Parameters**

- **win**: pointer to a window object

lv\_coord\_t **lv\_win\_get\_width**(lv\_obj\_t \*win)

Get width of the content area (page scrollable) of the window

**Return** the width of the content area

**Parameters**

- **win**: pointer to a window object

const lv\_style\_t \***lv\_win\_get\_style**(const lv\_obj\_t \*win, lv\_win\_style\_t type)

Get a style of a window

**Return** style pointer to a style

**Parameters**

- **win**: pointer to a button object
- **type**: which style window be get

static bool **lv\_win\_get\_drag**(const lv\_obj\_t \*win)

Get drag status of a window. If set to ‘true’ window can be dragged like on a PC.

**Return** whether window is draggable

**Parameters**

- **win**: pointer to a window object

void **lv\_win\_focus**(lv\_obj\_t \*win, lv\_obj\_t \*obj, lv\_anim\_enable\_t anim\_en)

Focus on an object. It ensures that the object will be visible in the window.

**Parameters**

- **win**: pointer to a window object
- **obj**: pointer to an object to focus (must be in the window)
- **anim\_en**: LV\_ANIM\_ON focus with an animation; LV\_ANIM\_OFF focus without animation

static void **lv\_win\_scroll\_hor**(lv\_obj\_t \*win, lv\_coord\_t dist)

Scroll the window horizontally

**Parameters**

- **win**: pointer to a window object
- **dist**: the distance to scroll (< 0: scroll right; > 0 scroll left)

static void **lv\_win\_scroll\_ver**(lv\_obj\_t \*win, lv\_coord\_t dist)

Scroll the window vertically

**Parameters**

- **win**: pointer to a window object
- **dist**: the distance to scroll (< 0: scroll down; > 0 scroll up)

struct lv\_win\_ext\_t

## Public Members

*lv\_obj\_t* \***page**

*lv\_obj\_t* \***header**

*lv\_obj\_t* \***title**

**const** lv\_style\_t \***style\_btn\_rel**

**const** lv\_style\_t \***style\_btn\_pr**

lv\_coord\_t **btn\_size**