/\*

u8g\_pb8h1.c

8bit height monochrom (1 bit) page buffer

byte has horizontal orientation

Universal 8bit Graphics Library

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total buffer size is limited to 256 bytes because of the calculation inside the set pixel procedure

23. Sep 2012: Bug with down procedure, see FPS 1st page --> fixed (bug located in u8g\_clip.c)

\*/

#include "u8g.h"

#include <string.h>

#ifdef \_\_unix\_\_

#include <assert.h>

#endif

/\* NEW\_CODE disabled, because the performance increase was too slow and not worth compared \*/

/\* to the increase of code size \*/

/\* #define NEW\_CODE \*/

#ifdef \_\_unix\_\_

void \*u8g\_buf\_lower\_limit;

void \*u8g\_buf\_upper\_limit;

#endif

void u8g\_pb8h1\_Init(u8g\_pb\_t \*b, void \*buf, u8g\_uint\_t width) U8G\_NOINLINE;

void u8g\_pb8h1\_set\_pixel(u8g\_pb\_t \*b, u8g\_uint\_t x, u8g\_uint\_t y, uint8\_t color\_index) U8G\_NOINLINE;

void u8g\_pb8h1\_SetPixel(u8g\_pb\_t \*b, const u8g\_dev\_arg\_pixel\_t \* const arg\_pixel) U8G\_NOINLINE ;

void u8g\_pb8h1\_Set8PixelStd(u8g\_pb\_t \*b, u8g\_dev\_arg\_pixel\_t \*arg\_pixel) U8G\_NOINLINE;

uint8\_t u8g\_dev\_pb8h1\_base\_fn(u8g\_t \*u8g, u8g\_dev\_t \*dev, uint8\_t msg, void \*arg);

#ifdef NEW\_CODE

struct u8g\_pb\_h1\_struct

{

u8g\_uint\_t x;

u8g\_uint\_t y;

uint8\_t \*ptr;

uint8\_t mask;

uint8\_t line\_byte\_len;

uint8\_t cnt;

};

static uint8\_t u8g\_pb8h1\_bitmask[8] = { 0x080, 0x040, 0x020, 0x010, 0x008, 0x004, 0x002, 0x001 };

static void u8g\_pb8h1\_state\_right(struct u8g\_pb\_h1\_struct \*s) U8G\_NOINLINE;

static void u8g\_pb8h1\_state\_right(struct u8g\_pb\_h1\_struct \*s)

{

register u8g\_uint\_t x;

x = s->x;

x++;

s->x = x;

x &= 7;

s->mask = u8g\_pb8h1\_bitmask[x];

if ( x == 0 )

s->ptr++;

}

static void u8g\_pb8h1\_state\_left(struct u8g\_pb\_h1\_struct \*s)

{

register u8g\_uint\_t x;

x = s->x;

x--;

s->x = x;

x &= 7;

s->mask = u8g\_pb8h1\_bitmask[x];

if ( x == 7 )

s->ptr--;

}

static void u8g\_pb8h1\_state\_down(struct u8g\_pb\_h1\_struct \*s)

{

s->y++;

s->ptr += s->line\_byte\_len;

}

static void u8g\_pb8h1\_state\_up(struct u8g\_pb\_h1\_struct \*s)

{

s->y--;

s->ptr -= s->line\_byte\_len;

}

static void u8g\_pb8h1\_state\_init(struct u8g\_pb\_h1\_struct \*s, u8g\_pb\_t \*b, u8g\_uint\_t x, u8g\_uint\_t y) U8G\_NOINLINE;

static void u8g\_pb8h1\_state\_init(struct u8g\_pb\_h1\_struct \*s, u8g\_pb\_t \*b, u8g\_uint\_t x, u8g\_uint\_t y)

{

u8g\_uint\_t tmp;

uint8\_t \*ptr = b->buf;

s->x = x;

s->y = y;

y -= b->p.page\_y0;

tmp = b->width;

tmp >>= 3;

s->line\_byte\_len = tmp;

/\* assume negative y values, can be down to -7, subtract this from the pointer and add correction of 8 to y \*/

ptr -= tmp\*8;

y+=8;

/\* it is important that the result of tmp\*y can be 16 bit value also for 8 bit mode \*/

ptr += tmp\*y;

s->mask = u8g\_pb8h1\_bitmask[x & 7];

/\* assume negative x values (to -7), subtract 8 pixel from the pointer and add 8 to x \*/

ptr--;

x += 8;

x >>= 3;

ptr += x;

s->ptr = ptr;

}

static void u8g\_pb8h1\_state\_set\_pixel(struct u8g\_pb\_h1\_struct \*s, uint8\_t color\_index) U8G\_NOINLINE;

static void u8g\_pb8h1\_state\_set\_pixel(struct u8g\_pb\_h1\_struct \*s, uint8\_t color\_index)

{

#ifdef \_\_unix\_\_

assert( s->ptr >= u8g\_buf\_lower\_limit );

assert( s->ptr < u8g\_buf\_upper\_limit );

#endif

if ( color\_index )

{

\*s->ptr |= s->mask;

}

else

{

uint8\_t mask = s->mask;

mask ^=0xff;

\*s->ptr &= mask;

}

}

#endif

void u8g\_pb8h1\_Init(u8g\_pb\_t \*b, void \*buf, u8g\_uint\_t width)

{

b->buf = buf;

b->width = width;

u8g\_pb\_Clear(b);

}

/\* limitation: total buffer must not exceed 256 bytes \*/

void u8g\_pb8h1\_set\_pixel(u8g\_pb\_t \*b, u8g\_uint\_t x, u8g\_uint\_t y, uint8\_t color\_index)

{

#ifdef NEW\_CODE

struct u8g\_pb\_h1\_struct s;

u8g\_pb8h1\_state\_init(&s, b, x, y);

u8g\_pb8h1\_state\_set\_pixel(&s, color\_index);

// u8g\_pb8h1\_state\_up(&s);

// if ( s.y > b->p.page\_y1 )

// return;

// if ( s.x > b->width )

// return;

// u8g\_pb8h1\_state\_set\_pixel(&s, color\_index);

#else

register uint8\_t mask;

u8g\_uint\_t tmp;

uint8\_t \*ptr = b->buf;

y -= b->p.page\_y0;

tmp = b->width;

tmp >>= 3;

tmp \*= (uint8\_t)y;

ptr += tmp;

mask = 0x080;

mask >>= x & 7;

x >>= 3;

ptr += x;

if ( color\_index )

{

\*ptr |= mask;

}

else

{

mask ^=0xff;

\*ptr &= mask;

}

#endif

}

void u8g\_pb8h1\_SetPixel(u8g\_pb\_t \*b, const u8g\_dev\_arg\_pixel\_t \* const arg\_pixel)

{

if ( arg\_pixel->y < b->p.page\_y0 )

return;

if ( arg\_pixel->y > b->p.page\_y1 )

return;

if ( arg\_pixel->x >= b->width )

return;

u8g\_pb8h1\_set\_pixel(b, arg\_pixel->x, arg\_pixel->y, arg\_pixel->color);

}

void u8g\_pb8h1\_Set8PixelStd(u8g\_pb\_t \*b, u8g\_dev\_arg\_pixel\_t \*arg\_pixel)

{

register uint8\_t pixel = arg\_pixel->pixel;

do

{

if ( pixel & 128 )

{

u8g\_pb8h1\_SetPixel(b, arg\_pixel);

}

switch( arg\_pixel->dir )

{

case 0: arg\_pixel->x++; break;

case 1: arg\_pixel->y++; break;

case 2: arg\_pixel->x--; break;

case 3: arg\_pixel->y--; break;

}

pixel <<= 1;

} while( pixel != 0 );

}

void u8g\_pb8h1\_Set8PixelOpt2(u8g\_pb\_t \*b, u8g\_dev\_arg\_pixel\_t \*arg\_pixel)

{

register uint8\_t pixel = arg\_pixel->pixel;

u8g\_uint\_t dx = 0;

u8g\_uint\_t dy = 0;

switch( arg\_pixel->dir )

{

case 0: dx++; break;

case 1: dy++; break;

case 2: dx--; break;

case 3: dy--; break;

}

do

{

if ( pixel & 128 )

u8g\_pb8h1\_SetPixel(b, arg\_pixel);

arg\_pixel->x += dx;

arg\_pixel->y += dy;

pixel <<= 1;

} while( pixel != 0 );

}

#ifdef NEW\_CODE

static void u8g\_pb8h1\_Set8PixelState(u8g\_pb\_t \*b, u8g\_dev\_arg\_pixel\_t \*arg\_pixel)

{

register uint8\_t pixel = arg\_pixel->pixel;

struct u8g\_pb\_h1\_struct s;

uint8\_t cnt;

u8g\_pb8h1\_state\_init(&s, b, arg\_pixel->x, arg\_pixel->y);

cnt = 8;

switch( arg\_pixel->dir )

{

case 0:

do

{

if ( s.x < b->width )

if ( pixel & 128 )

u8g\_pb8h1\_state\_set\_pixel(&s, arg\_pixel->color);

u8g\_pb8h1\_state\_right(&s);

pixel <<= 1;

cnt--;

} while( cnt > 0 && pixel != 0 );

break;

case 1:

do

{

if ( s.y >= b->p.page\_y0 )

if ( s.y <= b->p.page\_y1 )

if ( pixel & 128 )

u8g\_pb8h1\_state\_set\_pixel(&s, arg\_pixel->color);

u8g\_pb8h1\_state\_down(&s);

pixel <<= 1;

cnt--;

} while( cnt > 0 && pixel != 0 );

break;

case 2:

do

{

if ( s.x < b->width )

if ( pixel & 128 )

u8g\_pb8h1\_state\_set\_pixel(&s, arg\_pixel->color);

u8g\_pb8h1\_state\_left(&s);

pixel <<= 1;

cnt--;

} while( cnt > 0 && pixel != 0 );

break;

case 3:

do

{

if ( s.y >= b->p.page\_y0 )

if ( s.y <= b->p.page\_y1 )

if ( pixel & 128 )

u8g\_pb8h1\_state\_set\_pixel(&s, arg\_pixel->color);

u8g\_pb8h1\_state\_up(&s);

pixel <<= 1;

cnt--;

} while( cnt > 0 && pixel != 0 );

break;

}

}

#endif

uint8\_t u8g\_dev\_pb8h1\_base\_fn(u8g\_t \*u8g, u8g\_dev\_t \*dev, uint8\_t msg, void \*arg)

{

u8g\_pb\_t \*pb = (u8g\_pb\_t \*)(dev->dev\_mem);

switch(msg)

{

case U8G\_DEV\_MSG\_SET\_8PIXEL:

#ifdef NEW\_CODE

if ( u8g\_pb\_Is8PixelVisible(pb, (u8g\_dev\_arg\_pixel\_t \*)arg) )

u8g\_pb8h1\_Set8PixelState(pb, (u8g\_dev\_arg\_pixel\_t \*)arg);

#else

if ( u8g\_pb\_Is8PixelVisible(pb, (u8g\_dev\_arg\_pixel\_t \*)arg) )

u8g\_pb8h1\_Set8PixelOpt2(pb, (u8g\_dev\_arg\_pixel\_t \*)arg);

#endif

break;

case U8G\_DEV\_MSG\_SET\_PIXEL:

u8g\_pb8h1\_SetPixel(pb, (u8g\_dev\_arg\_pixel\_t \*)arg);

break;

case U8G\_DEV\_MSG\_INIT:

break;

case U8G\_DEV\_MSG\_STOP:

break;

case U8G\_DEV\_MSG\_PAGE\_FIRST:

u8g\_pb\_Clear(pb);

u8g\_page\_First(&(pb->p));

break;

case U8G\_DEV\_MSG\_PAGE\_NEXT:

if ( u8g\_page\_Next(&(pb->p)) == 0 )

return 0;

u8g\_pb\_Clear(pb);

break;

#ifdef U8G\_DEV\_MSG\_IS\_BBX\_INTERSECTION

case U8G\_DEV\_MSG\_IS\_BBX\_INTERSECTION:

return u8g\_pb\_IsIntersection(pb, (u8g\_dev\_arg\_bbx\_t \*)arg);

#endif

case U8G\_DEV\_MSG\_GET\_PAGE\_BOX:

u8g\_pb\_GetPageBox(pb, (u8g\_box\_t \*)arg);

break;

case U8G\_DEV\_MSG\_GET\_WIDTH:

\*((u8g\_uint\_t \*)arg) = pb->width;

break;

case U8G\_DEV\_MSG\_GET\_HEIGHT:

\*((u8g\_uint\_t \*)arg) = pb->p.total\_height;

break;

case U8G\_DEV\_MSG\_SET\_COLOR\_ENTRY:

break;

case U8G\_DEV\_MSG\_SET\_XY\_CB:

break;

case U8G\_DEV\_MSG\_GET\_MODE:

return U8G\_MODE\_BW;

}

return 1;

}