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Oled Switch Click

PID: MIKROE-2449

OLED Switch Click is a compact add-on board that combines a button and a full-color organic LED display. This board features the ISC15ANP4, a programmable smart display from NKK Switches. It comes with an OLED display that acts as a push button in a single durable case, with dust-tight construction and long life of three million actuation minimum. The OLED Switch Click also has one screw terminal block for connecting external electronics (to toggle it on and off). This Click board™ makes the perfect solution for the development of applications based on designing a control panel for an industrial machine, human-machine interface, or even a DIY arcade.

OLED Switch Click is supported by a mikroSDK compliant library, which includes functions that simplify software development. This Click board™ comes as a fully tested product, ready to be used on a system equipped with the mikroBUS™ socket.

How does it work?

OLED Switch Click is based on the ISC15ANP4, a programmable smart display from NKK Switches. The OLED display has a 64x48 pixels resolution with up to 65K colors (16-bit depth), or 256 colors in 8-bit mode, and a 180° of viewing angle. The life expectancy is up to 60000 hours depending on the luminance of the display and the percentage of the pixels set to on. The display is perfect for displaying simple information, whether as icons or words. The most interesting feature is that the display can be programmed to change the picture when needed. For example, you can design a reprogrammable keypad that switches from Latin to Cyrillic script or Chinese characters.

The internal frame buffer on the OLED display holds 96x64 pixels with 2 bytes of 565 formatted

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color information for each. When displaying an image that is the size of the display (64x48), the image will be displayed well unless scrolled. To scroll an image without having random pixels from unused space in the internal frame buffer, load a 96x64 image onto the OLED Switch Click with your desired image centered like the blue-colored area or similar. VisualTFT can be used to prepare the BMP images. There is a learn.microe.com article that explains how to take 16 or 24-bit BMP pictures and create C arrays. The article is about RGB matrices, but the same principle applies.

The mechanical button itself is nicely built, with translucent black housing. When pressed, it gives satisfying tactile feedback and has a distinct, long travel of 4.5mm. Its contacts have a 0.1A@12VDC rating to switch an external circuit over screw terminals. The internal button circuit is an SPST and is normally open. The pressure on the button itself above 100N can damage the OLED. In addition, this Click board™ features the MAX8574, a high-efficiency LCD boost with true shutdown from Analog Devices, that serves as a main OLED drive circuit power supply obtained from the mikroBUS™ 3.3V power rail.

The OLED Switch Click uses an SPI serial interface to communicate with the host MCU. In addition, the OLED can be reset over the RST pin, and a CD pin can set data to be interpreted as a Command or as Data depending on the logic state. The host MCU cannot know the push button's state over the mikroBUS™ socket.

This Click board™ can only be operated with a 3.3V logic voltage level. The board must perform appropriate logic voltage level conversion before using MCUs with different logic levels. However, the Click board™ comes equipped with a library containing functions and an example code that can be used as a reference for further development.

Specifications

Type	OLED
Applications	Can be used for the development of applications based on designing a control panel for an industrial machine, human-machine interface, or even a DIY arcade
On-board modules	ISC15ANP4 - programmable smart display from NKK Switches
Key Features	OLED Display 64x48 pixels with 65K colors in 16-bit depth, crisp and clear images, screw terminals for switching 12VDC at 100mA, long durability, reliability, OLED power supply isolation, and more
Interface	GPIO,SPI
Feature	No ClickID
Compatibility	mikroBUS™
Click board size	M (42.9 x 25.4 mm)
Input Voltage	3.3V

Pinout diagram

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This table shows how the pinout on Oled Switch Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS				Pin	Notes
	NC	1	AN	PWM	16	**CD**	Command/Data
Reset	**RST**	2	RST	INT	15	NC	
SPI Chip Select	**CS**	3	CS	RX	14	NC	
SPI Clock	**SCK**	4	SCK	TX	13	NC	
	NC	5	MISO	SCL	12	NC	
SPI Data IN	**SDI**	6	MOSI	SDA	11	NC	
Power Supply	**3.3V**	7	3.3V	5V	10	NC	
Ground	**GND**	8	GND	GND	9	**GND**	Ground

Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator

Oled Switch Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Resolution	-	64x48	-	px
Screen Size		15.5x11.6		mm
Switching Voltage	-	-	12	VDC
Switching Current	-	-	100	mA

Software Support

We provide a library for the OLED Switch Click as well as a demo application (example), developed using MIKROE compilers. The demo can run on all the main MIKROE development boards.

Package can be downloaded/installed directly from NECTO Studio Package Manager (recommended), downloaded from our LibStock™ or found on Mikroe github account.

Library Description

This library contains API for OLED Switch Click driver.

Key functions

- This function writes to control and configuration registers on the chip.
- This function sets the digital output signal for the PWM pin.
- This function sets the digital output signal for the RST pin.

Example Description

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This example showcases how to configure and use the OLED Switch click. This click is a combination of a button and a full color organic LED display. Displays settings are first loaded onto the chip and after that you can show any 64x48 pixel image on the display.

The full application code, and ready to use projects can be installed directly from NECTO Studio Package Manager (recommended), downloaded from our LibStock™ or found on Mikroe github account.

Other Mikroe Libraries used in the example:

- MikroSDK.Board
- MikroSDK.Log
- Click.OledSwitch

Additional notes and informations

Depending on the development board you are using, you may need USB UART click, USB UART 2 Click or RS232 Click to connect to your PC, for development systems with no UART to USB interface available on the board. UART terminal is available in all MIKROE compilers.

mikroSDK

This Click board™ is supported with mikroSDK - MIKROE Software Development Kit. To ensure proper operation of mikroSDK compliant Click board™ demo applications, mikroSDK should be downloaded from the LibStock and installed for the compiler you are using.

For more information about mikroSDK, visit the official page.

Resources

mikroBUS™

mikroSDK

Click board™ Catalog

Click Boards™

Downloads

OLED Switch click example on Libstock

OLED Switch click schematic

Oled Switch click 2D and 3D files

ISC15ANP4 datasheet