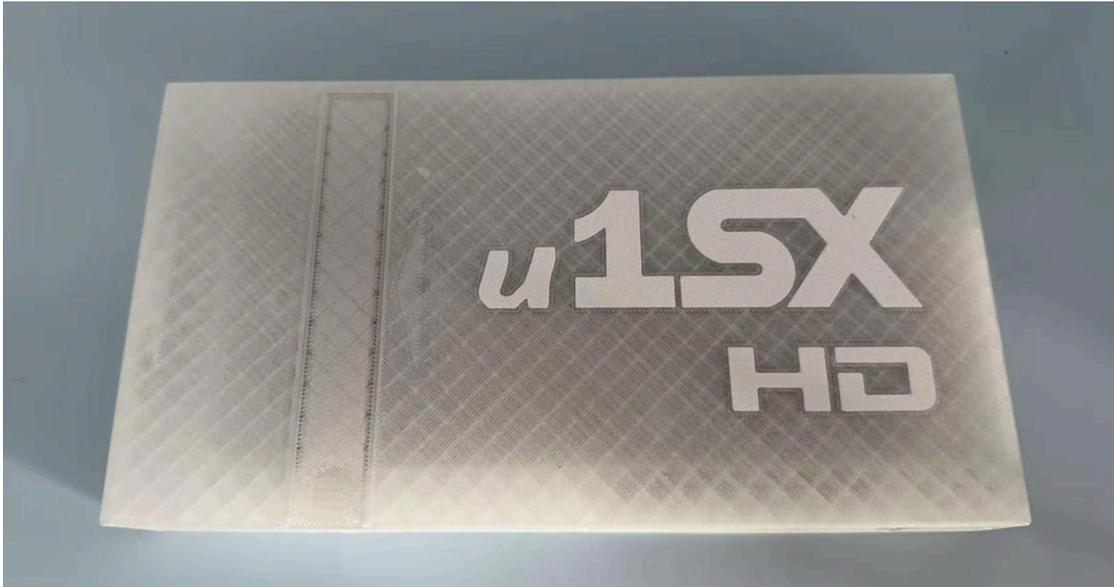


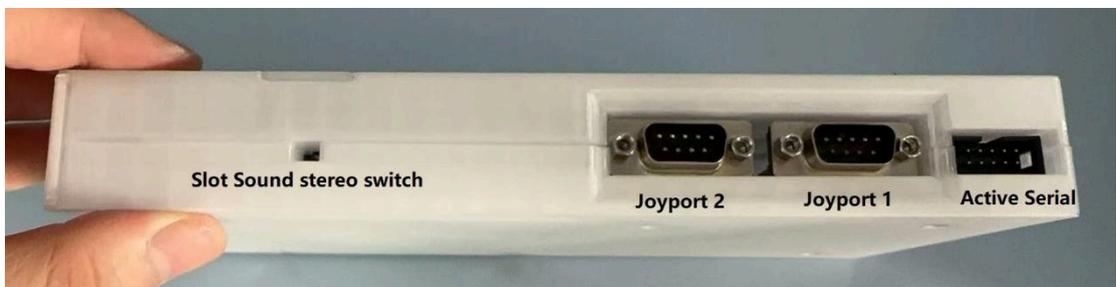
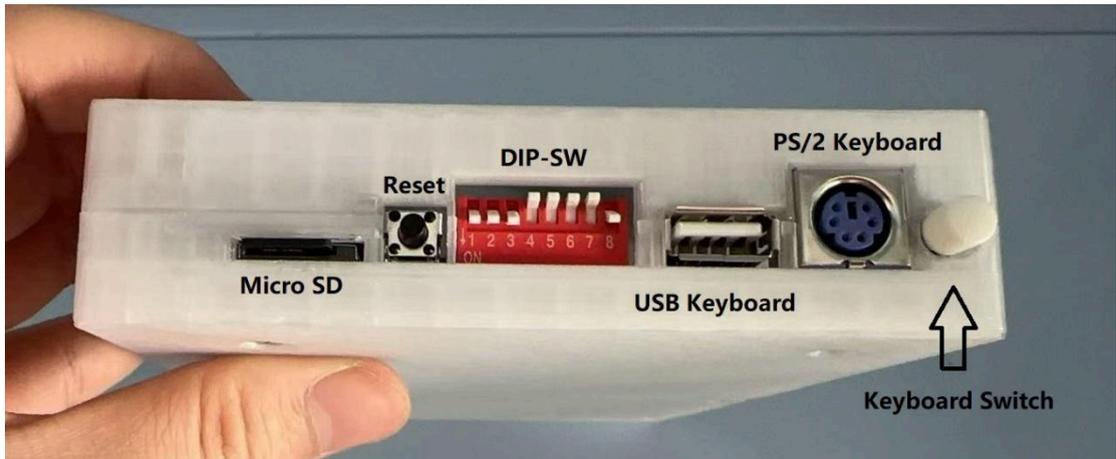
u1-SX HDMI Rev.4.7

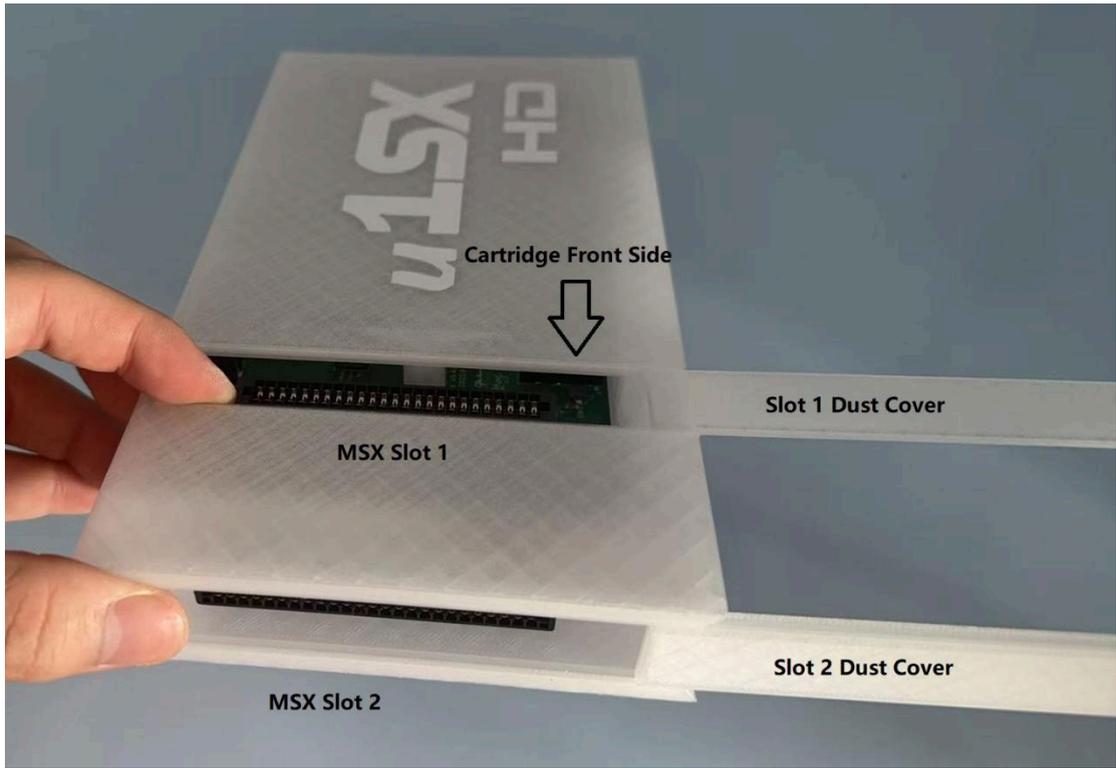
Altera FPGA board MSX2+ compatible.
Updated on 2025.8.13

MSX++ OCM-PLD v3.9.2 By KdL.
Designed, produced and sold by Denjhang.
3D printed PLA/PETG enclosure designed by Rik.
Welding and debugging by Ming.



Interface Description





Product Information

The **u1-SX** is a MSX FPGA compatible 100% with the MSX2+ standard. It features VGA+HDMI Video output , stereo audio output (can be switched via smart command), PS/2 keyboard input, 2 DB9 joystick ports, SD card slot and 2 cartridge slots . The unit has a small form factor, about 150x200 mm, and it comes in a PLA/PETG Case.

u1-SX HDMI Rev.4.7 is based on uMSX Rev.3.80 and has added a lot of practical functions. It is a truly professional MSX++ compatible machine. Every function is designed and debugged by me personally to ensure that it is complete and effective.

At the same time, u1-SX also supports a special WI-FI Dongle, which is fully compatible with the UNAPI standard and can wirelessly access MSXHUB and Gopher Network.

The latest version of OCM-PLD v3.9.2 adds a new hardware VGA scan line function to make VGA images more retro.

Internally, the **u1-SX** also features SCC+ sound, FM sound, selectable 2 or 4 Mb RAM mapper, and turbo mode (5,37mhz/8,06mhz). Each cartridge slot can be also configured as internal MegaSCC+.

You can connect almost any PS/2 or USB keyboard and MSX compatible joysticks (DB9). The unit also includes a SD slot that can be used as mass storage device through BASIC or MSXDOS command line.



u1-SX uses Official MSX++ systems, MSX++ computer is a 1chipMSX machine equipped with OCM-PLD firmware upgrade.

Special thanks to KdL for their long-term development of OCM-PLD and their support to me, and also to all the firmware developers.

Also thanks to all u1-SX buyers, it is you who made u1-SX.

Next I plan to improve u1-SX, complete the design of u2-SX series hardware, and invest in the development of u1-SX Tablet/Laptop.

Technical features

- o 1ChipMSX Clone (OCM 1st Gen), MSX2+ compatibility.
- o Altera Cyclone EP1C12Q240C8N FPGA.
- o MT48LC16M16A2 32Mb SRAM.
- o KdL OCM firmware compatible (ver. 3.9.2 official support).
- o Newest MSX++ Compatible , Smart command support.
- o 2x standard MSX Cartridge Slot Connectors .
- o 1x microSD Card Slot .
- o D-Sub 15 VGA/RGB video output.
- o FPGA-generated VGA/HDMI scan lines.
- o 3.5mm jack stereo audio output.
- o PS/2 or USB Keyboard Port , based on hidman-micro
- o 2x DB9 joystick port.
- o DC 5.5*2.1 connector for power supply 5V.
- o WI-FI Dongle(UNAPI Compatible).

Exclusive Features

- o Professional 4-layer PCB layout design with independent power layer.
- o Customized EPBIOS and SDBIOS, unique u1-SX HDMI boot logo upon startup.
- o HDMI v1.3 Output , support HDMI Audio
- o 3.5mm audio and HDMI output simultaneously
- o Professional audio circuit design with independent audio power supply isolation.
- o Fully assembled PLA/PETG case.
- o Rail-to-rail pre-amplifier with four op amps.
- o Disc volume potentiometer.
- o Dual monitor support, VGA and HDMI output simultaneously.
- o Murata EMI Network Filter Arrays
- o Support Mamidimemo VSIF port.

The u1-SX HDMI incorporates many of my original designs:

1. HDMI 1.3 video output for strong compatibility
2. HDMI audio support, including MSX Slot Sound and MSX2+ OPLL+PSG+SCC.
3. Simultaneous HDMI and VGA outputs , Supports Dual monitor.
4. Professional 4-layer PCB design with independent power planes for interference-free, clean, and sharp video output
5. Professional audio circuit design with rail-to-rail quad op-amp preamplifier for clean, resonant sound
6. Murata EMI Network Filter Arrays for pure DC 5V power input
7. Independent power isolation for controller, Wi-Fi, and USB keyboard to reduce RF interference.
8. External PS/2 mouse function is supported via MSX Nano Mouse
9. External maMIDImemo VSIF support, which allows OPLL+SCC+PSG to play music via PC MIDI control, as well as VGM playback.
10. External MSX Bluetooth Controller Support.
11. PS/2 and USB keyboard toggle switch.
12. External OPM/OPL3/OPNA/Y8950 Sound Cartridge

These new features far surpass those of similar OCM models like the original 1ChipMSX/Zemmex Neo/SX-1. Please cherish these unique new features.

The u1-SX is not a simple OCM clone; it embodies years of hard work and technical expertise.

All of this is designed to give you a more complete and powerful MSX++ experience.

True love for MSX, I carefully tested every function of every u1-SX.

Listen patiently to buyers' suggestions and continuously improve products.

Disclosure: Because the way video signal is generated the image could present light vertical bars across the screen, depending on the monitor and selected video output. This behaviour is most noticeable on flat panel monitors receiving RGB/composite signal.

Please do not directly connect the Sega Genesis/ Mega Drive Joystick to u1-SX, you must use the included handle adapter to connect to u1-SX.

Contact and Support

Debugging videos of all products will be uploaded to Bilibili:

<https://space.bilibili.com/623253809>

This is my Github homepage, with many of my original projects:

<https://github.com/denjhang>

This is my twitter homepage:

<https://twitter.com/tzvyrkn734834>

Here is my YouTube homepage:

https://www.youtube.com/channel/UCyTAYLpruW48R6R_JJHUYOA

My Email:

676420807@qq.com

ltj825152013@gmail.com

DIP-SW Functions

The red DIP switch is used to control important functions, please refer to the figure below for details:

Switch	Function	Setting	
SW1	CPU Speed	OFF	CPU 3.58Mhz
		ON	CPU 8.06Mhz -TurboPANA 5.37Mhz -Turbo Mega SD enabled
SW2/SW3	Video Output	OFF/OFF	Composite Video/S-Video (NTSC, 60hz)
		OFF/ON	RGB (through VGA connector).
		ON/OFF	VGA 31khz/60Hz
		ON/ON	VGA w/ scanlines, 31Khz/60Hz
SW4	SLOT 1 Config	OFF	External slot 1 enabled
		ON	internal MEGASCC+ (1Mb) enabled External slot 1 disabled
SW5/SW6	SLOT 2 Config	OFF/OFF	External slot 2 enabled
		OFF/ON	internal ESE MegaRAM 1Mb (ASCII 8Kb BANK). External slot 2 disable
		ON/OFF	internal ESE MegaSCC+ 1Mb. External slot 2 disable
		ON/ON	internal ESE MegaRAM 1Mb (ASCII 16Kb BANK). External slot 2 disable
SW7	RAM Mapper	OFF	2Mb internal RAM mapper
		ON	4Mb internal RAM mapper
SW8	SD Card Slot	OFF	Disabled
		ON	Enabled

Warning!! Do not alter DIP switches settings while the unit is powered on!! DOING SO MIGHT DAMAGE THE UNIT

Special keys

The u1-SX supports standard PC PS/2 keyboards.

All the u1-SX functions and settings are accessible through key strokes and shortcuts. Special MSX keys (STOP, GRAPH, etc) are mapped to PC keyboard as well:

PC Key/ Combo	Function
END	MSX STOP Key
ALT	MSX GRAPH Key
WIN	MSX SPACE Key
F6	MSX GRAPH Key
F7	MSX KANA Key
F8	MSX SELECT Key
F9	Increase PSG volume
SHIFT + F9	Decrease PSG volume
F10	Increase SCC volume
SHIFT + F10	Decrease SCC volume
F11	Increase FM volume
SHIFT + F11	Decrease FM volume
PAGE UP	Increase overall volume
PAGE DOWN	Decrease overall volume
F12	Changes CPU speed between 3.58MHz, 5.37MHz and 8.06MHz
PRINTSCREEN/ SHIFT + PRINTSCREEN	Changes video output CVBS/S-Video, SCART, VGA 31KHz, VGA+ 31KHz
SCROLL LOCK	Enable/disable tape input mode
SHIFT + F12	Toggles SLOT 1 configuration external/SCC+
SHIFT + SCROLL LOCK	Toggles SLOT 2 configuration external/ASCII8/SCC+/ASCII16

Status LEDs

There are 9 LEDs on board to show the status of different u1-SX configurations. LEDs will turn ON/OFF depending on a setting being enabled or disabled. Also, while adjusting volume the LEDs will show the level (from 1 to 9) of the volume.

LED	Status	
1	Flashing	SD activity. Flash memory activity
2	ON	4Mb RAM Mapper
	OFF	2Mb RAM Mapper
3/4	OFF/OFF	External SLOT 2 Enabled
	OFF/ON	ESE-MegaRAM ASCII 8K
	ON/OFF	ESE-MegaSCC+
	ON/ON	ESE-MegaRAM ASCII 16K
5	OFF	External SLOT 1 Enabled
	ON	ESE-SCC+
6/7	OFF/OFF	Composite Video/S-Video output
	OFF/ON	15khz RGB+Audio through VGA connector
	ON/OFF	VGA
	ON/ON	VGA with scanlines
8/9	OFF/OFF	Standard 3.58Mhz Clock
	OFF/ON	Turbo 5.37Mhz Clock
	ON/OFF	Turbo 8.06Mhz Clock

Keyboard LEDs are also used to show configuration status:

SCROLL LOCK LED: Tape input ON/OFF

NUM LOCK LED: Kana mode ON/OFF

Attention! DIP switch, keys and LED functions can change if a different firmware is loaded onto the board.