Evaluation of MYIR's MYD-Y6ULX-CHMI Display Panel

Human Machine Interface (HMI) is a graphical interface between the user and the machine that allows humans to interact with machines, thus helping us effectively control equipment as well as getting real time data acquisition. Nowadays HMIs are widely used in countless sectors like electronics, entertainment, automation, industry, military, medical, etc. A user-friendly HMI can help increase productivity by having a centralized control system.

The MYD-Y6ULX-CHMI Display Panel introduced by MYIR is specially designed for HMI applications which is based on NXP's i.MX 6UL / 6ULL ARM Cortex-A7 processors. It is ready to run Linux and consists of an MYD-Y6ULX-HMI Development Board and a **7-inch capacitive LCD** mounting on its top. It is delivered with necessary cable accessories including **one 12V/2A power adapter with four types of conversion plugs, one power switch cable and a quick start guide** to help user start to use right away when getting it out of box.

MYD-Y6ULX-CHMI Display Panel

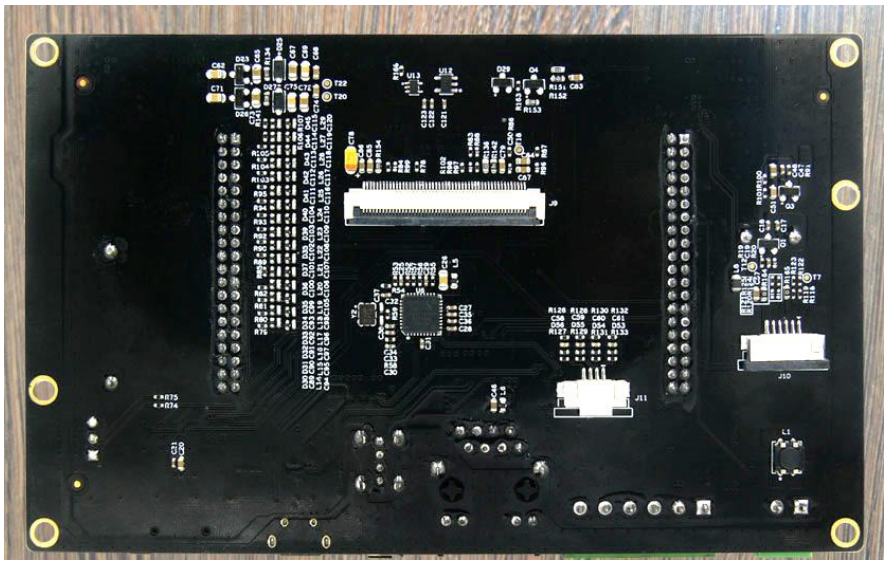
MYIR also offers an add-on optional IO board MYB-Y6ULX-HMI-4GEXP for the MYD-Y6ULX-CHMI Display Panel to further extend the functionality of the panel including **one more Ethernet, WiFi & BT, USB based 4G LTE Module Mini-PCIe interface, Audio and GPIOs**, thus making a complete solution for HMI applications. The IO board is delivered with **one WiFi antenna** and **one 4G antenna** but 4G module is told only as an option and user can contact MYIR for details.

MYB-Y6ULX-HMI-4GEXP IO Board

Let's know more about the MYD-Y6ULX-CHMI Display Panel.

The MYD-Y6ULX-HMI Development Board can support DC 12V~24V power supply. It is built around the MYC-Y6ULX CPU Module which has a compact design, measuring only 37mm by 39mm. It has integrated the i.MX 6UL/6ULL processor, DDR3, NAND FLASH/EMMC and was well soldered onto the base board through its 1.0mm pitch 140-pin Stamp Hole (Castellated-Hole) Expansion Interface which is cost-effective but with high reliability and strong vibration resistance.

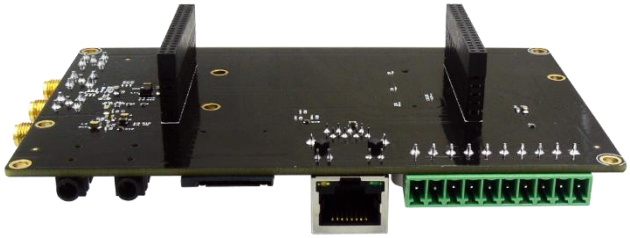
The 7-inch LCD provided by MYIR offers 800x480 pixels display resolution with a capacitive touch screen. Separate the LCD from the MYD-Y6ULX-HMI board, we can see on the back of the board there is one LCD interface (16-bit RGB), one capacitive touch screen interface and one resistive touch screen interface. The i.MX 6UL/6ULL series processors can support maximum 1366 by 768 pixels display resolution.

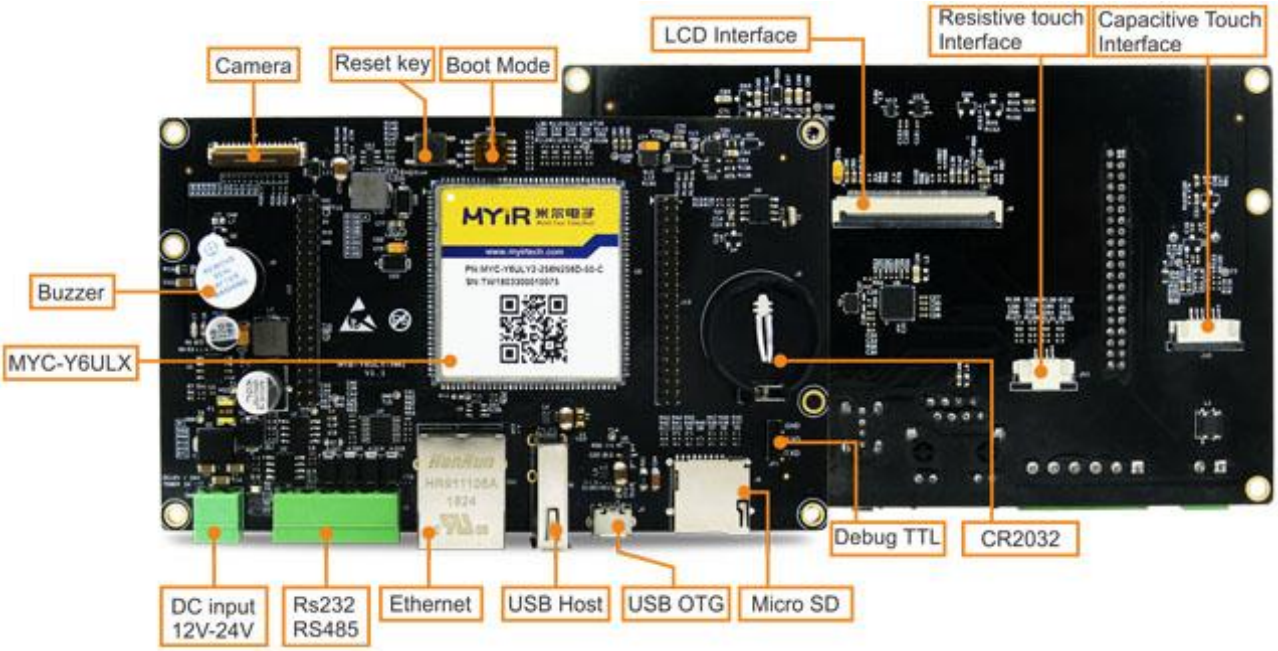


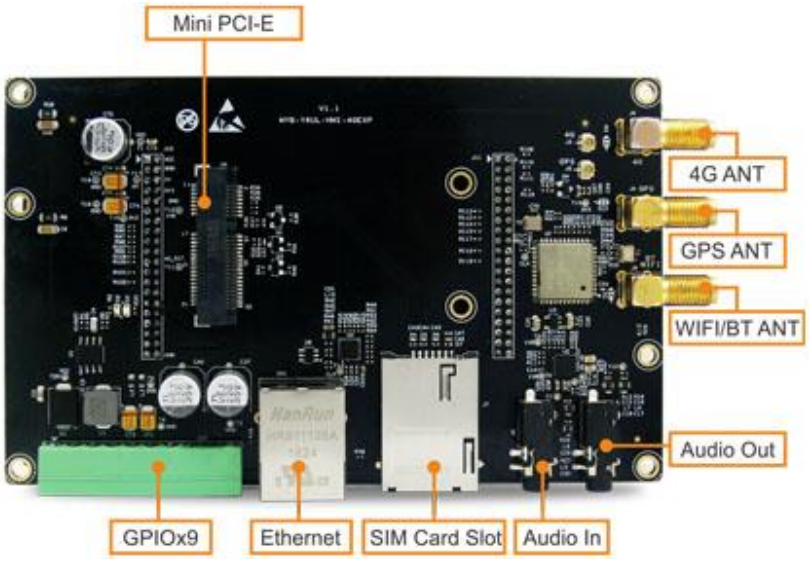
On the MYD-Y6ULX-HMI board, from left to right, we can see one 2-pin 3.81mm pitch phoenix connector for 12V~24V DC power input (one power switch cable was provided), one 3-wire RS232 serial port and one RS485 serial port from the 6-pin phoenix connector, one 10/100Mpbs Ethernet port, one USB Host port (Type A), one Micro USB OTG port and one TF card slot.

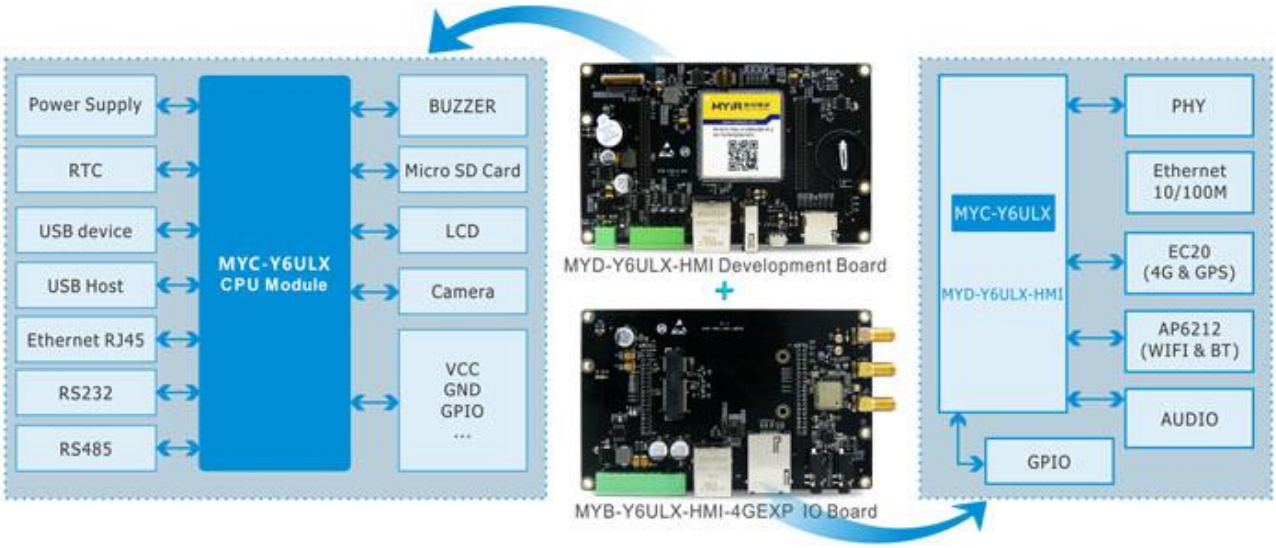
Near the TF card slot, there is one 2.54mm 3-pin header for Debug port and RTC battery holder. On the other side of the board, there is one 8-bit parallel camera interface, buzzer and one reset button.

The MYD-Y6ULX-HMI board has two 2.0mm pitch 2*20-pin headers for IO extension. The MYB-Y6ULX-HMI-4GEXP is just an IO extension board designed by MYIR.

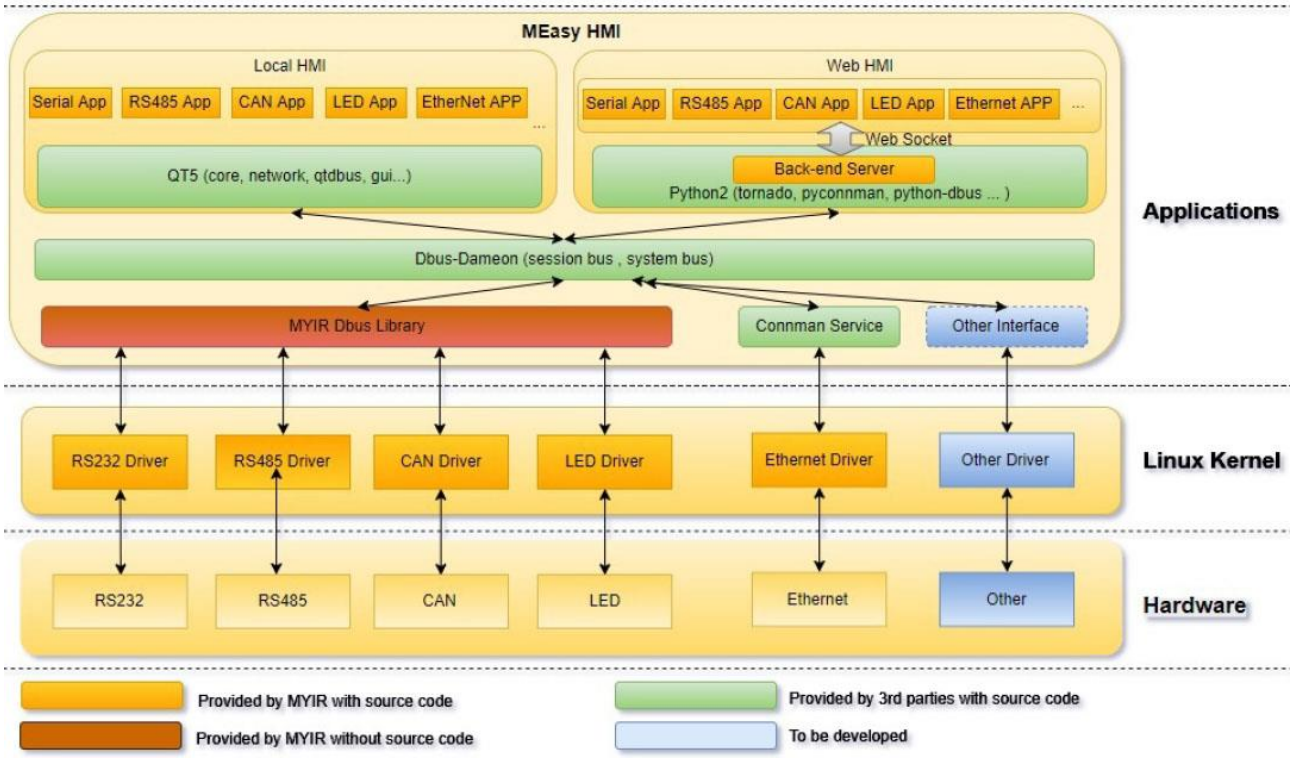



Camera
Reset key
Boot Mode
LCD Interface
Resistive touch Interface
Capacitive Touch Interface
Buzzer
MYC-Y6ULX
Debug TTL
CR2032
DC input 12V-24V
Rs232 RS485
Ethernet
USB Host
USB OTG
Micro SD


Mini PCI-E
4G ANT
GPS ANT
WIFI/BT ANT
Audio Out
GPIOx9
Ethernet
SIM Card Slot
Audio In


Power Supply
RTC
USB device
USB Host
Ethernet RJ45
RS232
RS485
MYC-Y6ULX
CPU Module
BUZZER
Micro SD Card
LCD
Camera
VCC
GND
GPIO
...
MYD-Y6ULX-HMI Development Board
+
MYB-Y6ULX-HMI-4GEXP IO Board
MYC-Y6ULX
MYD-Y6ULX-HMI
PHY
Ethernet 10/100M
EC20 (4G & GPS)
AP6212 (WIFI & BT)
AUDIO
GPIO

The MYD-Y6ULX-CHMI is ready to run Linux operating system. MYIR has built an application demo MEasy HMI to run on this platform. The MEasy HMI is a frame of human-machine interfaces which contains a local HMI based on QT5 and a Web HMI based on Python2 back end and HTML5 front-end. The dependency software includes dbus, connman and QT5 applications, python, tornado and other components. The MEasy HMI block diagram is shown as below:



The MEasy HMI uses D-Bus as the access interface for the QT application and the underlying hardware. MYIR provides a complete set of control and communication interfaces for RS232, RS485, CAN and LED and encapsulates the interface into a library for external use based on D-BUS Method and Signal. The MEasy HMI uses Connman to control network devices. Connman is a fully modular system that can be expanded by plug-in to support the management of EtherNet, WIFI, 3G/4G, Bluetooth and other network devices.

The directory structure of MEasy HMI is shown as below.

```
/
├── home
│   └── myir
│       ├── mxapp
│       ├── mxbackend
│       ├── mxcan
│       ├── mxinfo
│       ├── mxled
│       ├── mxnet
│       ├── mxrs485
│       ├── mxserial
│       ├── mxsupport
│       └── mxtaskmanager
└── usr
    ├── bin
    │   ├── psplash
    │   └── psplash-write
    ├── lib
    │   ├── fonts
    │   │   └── msyh.ttc
    │   ├── girepository-1.0
    │   ├── gobject-introspection
    │   ├── libgirepository-1.0.la
    │   ├── libgirepository-1.0.so
    │   ├── libgirepository-1.0.so.1
    │   ├── libgirepository-1.0.so.1.0.0
    │   └── python2.7
    └── share
        ├── applications
        ├── myir
        │   ├── mxde.xml
        │   ├── settings.ini
        │   ├── board_cfg.json
        │   └── www
        │       ├── application.py
        │       ├── handler
        │       ├── README.md
        │       ├── server.py
        │       ├── statics
        │       └── template
        └── pixmaps
```

User can get more information about the MYD-Y6ULX-CHMI from MYIR's website: http://www.myirtech.com/list.asp?id=604