A Quick Look at HMI Touch Screen in Industrial Scenes

In modern society, mobile phone is almost a necessity for everyone. When your mobile phone is not around, you may easily feel anxious as if something is missing, which is called nomophobia.

In the past, people used to check if they had taken money when they went out. But now, mobile phone is the thing people must take. As is known to us, as long as you take a mobile phone, it's easy to get food, clothes, and to take transport. Look at our mobile phones, you will find almost all of them are equipped with touch screens now, which are much better than the early keyboard for using.

So, how much do you know aboutHMItouch screens in industrial scenes?

As the input means of the device, touch screen replaces the keyboard and mouse. Users can directly operate it on the display screen.

This intuitive, fast and easy-to-use mode has brought great benefits to the industrial application. As a human-computer interaction terminal, touch screen is widely applied in power, factory, municipal, chemical, and mechanical equipment.

With various HMI touch screens, users can get the most intuitive experience for operation monitoring.

Figure 1: *Use scenario of HMI touch screen*

According to the working principle of touch screen and the classification of transmission media, there are four types of touch screen: resistive touch screen, capacitive - inductive touch screen, IR touch screen and surface acoustic wave touch screen. This article mainly introduces the resistive and capacitive - inductive touch screen.

1. Resistive Touch Screen

Early touch screen mobile phones applied resistive touch screens. People could click on the screen only by using touch pen or fingernail tip, for it needs some pressure to work.

In fact there are two layers in the resistive screen, and the middle is separated by an insulator. When the two layers collide with each other, there will be an impact. The chip calculates the data between the force and the current, evaluates which position of the screen is pressed, and reacts accordingly.

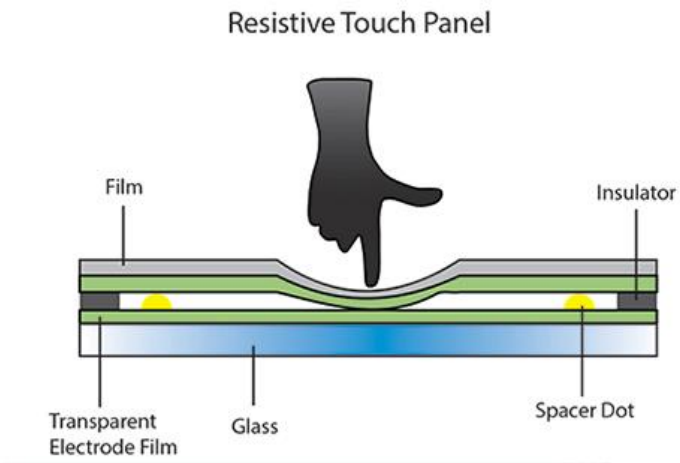

Figure 2: *Make contact to the resistive touch screens (Source from epectec.com).*

2. Capacitive Touch Screen

Today smart phones are manufactured with capacitive touch screens, and so as industrial PCs.

You can operate this touch screen by fingertip contact instead of gloves or the touch pen. The reason is that the capacitive screen transmits signals from the lower layer to the upper layer, when the upper layer is contacted by the conductor, the lower layer can receive the signals and make calculations.

Therefore, the two-layer screen does not require direct contact, but it determines the position of finger contact through the information received by the lower layer. Due to this, the capacitive screen can not only support multiple points at the same time, but also greatly improve the touch sensitivity.

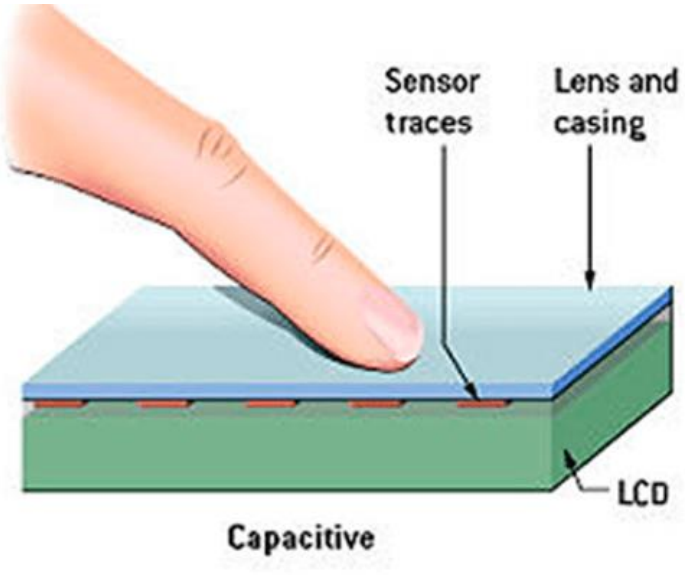

Figure 3: *Contact being made on a capacitive touch screen.*

There are 2 types of capacitive touch screens - surface capacitive type and projective capacitive type screens.

Surface capacitive touch screen uses ITO conductive film to sense the touch behavior of the screen surface through electric field induction. However, there are some limitations to the surface capacitive touch screen that it can only recognize one fingertip or one touch. In addition, considering the size of the electrode, it is not suitable for small screen.

Projective capacitive touch screen is a kind of sensor that emits electrostatic field line by the electrode.

	Resistive screen	Projection Capacitive Screen

Operation Mode	Single point operation	Support multi touch
Surface Material	The outer layer of the composite film is made of plastic material.	Glass
Touch Sensitivity	* Pressure needed. * Users operate with gloves and touch pen.	* The slightest contact from the surface of the biological electricity of warm fingers. * Non living objects - nails and gloves are invalid.
Touch Accuracy	At least a single display pixel.	Difficult to recognize complex handwritten input on small screen.
Wear Resistance	* The resistive touch screen requires a certain pressure, so it is easy	Dust proof, waterproof and high wear resistance.

	to get worn and torn. * The upper and lower layers may lose elasticity, resulting in poor contact. * Short service life.	
EMC	Not easy to be affected.	Inductance and magnetic induction outside may make the touch screen fail.
Touch Correction	The material of resistive touch screen itself is different, and its parameters will change with the passage of time, so frequent correction is needed.	Only one correction is required. However, when the environmental temperature and humidity change, and the environmental electric field changes, the capacitive screen will drift and the accuracy will be affected.

Table 1: *Comparison between resistive screen and projection capacitive screen.*

We can conclude that the two types of technologies have their own advantages and disadvantages. If users want a large screen or one that can zoom freely, it is recommended to choose capacitive screen whose multi touch function increases a lot of interactive fun.

For applications requiring high touch accuracy and small screen, you'd better select resistive screen. And Phoenix Electric offers both two options.

Phoenix provides HMI and industrial PC with full screen touch.

3. Phoenix HMI Touch Screen

Figure 4: *PHOENIX CONTACT HMI 2895653*

Here are 2 types of touch screens from Phoenix Electric.

3.1 Phoenix Web Panel

The outdoor web panel adopts new processor and surface glass touch technology to ensure its performance and stability even in harsh outdoor environment. After the application certification of C1D2, it can operate and monitor the system in any environment.
Web panel is an economical operation panel for basic operation and monitoring tasks.

* Advantages of Phoenix Web Panels

Readable under direct sunlight
UV and IR resistant
Wide temperature design
IP67, waterproof
Resistance to environmental factors such as salt spray, termites and chemicals.
Operate with work gloves

3.2 Phoenix Outdoor HMI

Figure 5: *PHOENIX CONTACT HMI DVG-OPC5315 079-BC AB.03*

As same as outdoor web panel, outdoor touch screen adopts new processor and surface glass touch technology, and is suitable for operating and monitoring the system in any environment certificated by C1D2.

* Advantages of Phoenix Outdoor HMI

Readable under direct sunlight
UV ad IR resistant
Wide temperature design
IP67 or IP65, waterproof
Resistance to environmental factors such as salt spray, termites and chemicals
Operate with work gloves