

Figure 2 - Window for selecting a file.

Then the word "Waiting" will be replaced by the phrase "File selected". Now we have only to choose the operation "Code" or "Decode". Upon completion of the operation there appears "Coding completed" or "Decoding completed" respectively.

So we can say that our char-code is quite modest among his titled "colleagues", but thanks to the speed and quality of encryption with its help it can take its rightful place.

References:

1. Щербаков, А. Ю. Современная компьютерная безопасность. Теоретические основы. Практические аспекты / А. Ю. Щербаков // Уч. пособие. – Москва, 2009. – 352 с.
2. Адаменко, М. В. Основы классической криптологии: секреты шифров и кодов / М. В. Адаменко // Уч. пособие. – Москва, 2012. – 256 с.

FLEXIBLE DISPLAYS

*Belarusian State University of Informatics and Radioelectronics
Minsk, Republic of Belarus*

Zhuk S.D.

Liahushevich S.I. – candidate of philological sciences

The manufacturing of flat panel displays is a dynamic and continuously evolving industry. Improvements of flat panel displays are made rapidly as technology improves and new discoveries are made by display scientists and engineers. The development of flexible display technology promises to reshape the global flat panel display landscape and open up compelling new applications for displays which do not exist today.

The cathode ray tube and active matrix liquid crystal display (LCD) recently celebrated their 100th and 25th anniversary, respectively. The arrival of portable electronic devices has put an increasing premium on durable, lightweight and inexpensive display components. In recent years, there has been significant research investment in the development of a flexible display technology. Flexible displays may only be flexed once during their life time; for example, during manufacturing to create a permanently conformed display.

To enable a flexible flat panel display, a flexible substrate must be used to replace conventional glass substrates, which can be either plastic or thin glass. Flexible flat panel display technologies offer many potential advantages, such as very thin profiles, light weight and robust display systems, the ability to flex, curve, conform, roll, and fold a display for extreme portability, high-throughput manufacturing, wearable displays integrated in garments and textiles, and ultimate engineering design freedom.

Flexible displays, in principle, are amendable to a roll-to-roll manufacturing process which would be a revolutionary change from current batch process manufacturing. Figure1 shows a simple conceptual illustration of a roll-to-roll manufacturing process where display materials are deposited on indium-tin-oxide (ITO) coated plastic substrates, processed, and rolled backup. As compared to a batch process, which handles only one component at a time, roll-to-roll processing represents a dramatic deviation from current manufacturing practices. If and when roll-to-roll manufacturing technology matures for display processing, it promises to reduce capital equipment costs, reduce display part costs, significantly increase throughput, and it may potentially eliminate component supply chain issues if all processes are performed with roll-to-roll techniques. Although batch processing can still be employed to manufacture flexible flat panel displays, many researchers and technologists believe that roll-to-roll manufacturing will ultimately be implemented.

The technology attributes of flexible displays and schematic diagram of a roll-to roll manufacturing process are

presented in the figures 1 and 2 respectively.

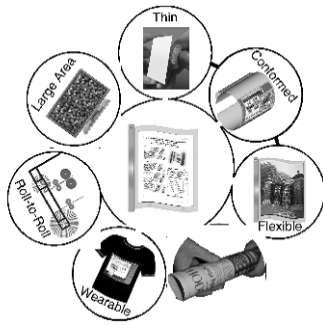


Fig. 1 – The technology attributes of flexible displays

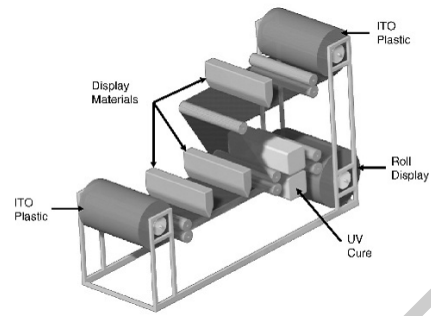


Fig. 2 – A simple schematic diagram of a roll-to-roll manufacturing process

The technology of flexible displays includes many components and supporting technologies. Anticipating a new market opportunity, the display industry has been developing display materials targeted specifically at flexible flat panel display requirements. These technologies must be compatible and converge to enable a truly flexible display. The necessary technologies include robust flexible substrates, conducting transparent conducting oxides and/or conducting polymers, electro-optic and reflecting materials, inorganic and organic electronics, and packaging technologies. In addition, many processes must also be developed and optimized in concert with the materials development, such as roll-to-roll manufacturing, coating technology, and printing. In reality, these components and processes can not be optimized independently since a flexible display is a complex system of linked components that must be co-developed in order to function efficiently.

Literature sources:

1. Flexible flat panel displays : SID. – Santa Clara, CA, 2005.
2. Liquid Crystal Displays : SID – New York, 2011.

THE STUDY OF TEMPERATURE PROFILES WITH MINICOMPUTER

*Belarusian State University of Informatics and Radioelectronics
Minsk, Republic Belarus*

V.G. Levin

S.I. Liahushevich – candidate of Philological Sciences

Modern electronic manufacturing is characterized by a high level of automatization and accuracy. The creating of new measuring and controlling devices is one of the main part of modern production in electronic industry.

Nowadays technology advance is achieved by the improvement of instruments, equipment, materials as well as through the development of new and more efficient processes. The application of the methods of heating components and materials based on contactless technology using a ring or magnetic inductor, light emission, hot air is perspective. But not only the choice of technology determines the efficiency of the soldering process. Another important component is the monitoring of process parameters with the help of controllers and computers. We can use some CAD programs to predict how system will behave and control its parameters using a minicomputer. For example, we can modulate temperature with Comsol Multiphysics and then control this temperature with minicomputer Raspberry Pi connected with thermocouple (pic. 1). Raspberry PI is a credit-card-sized single-board computer based on ARM processor.

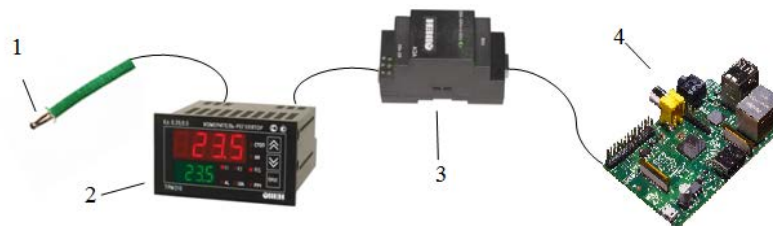


Fig. 1 - Structural diagram temperature measurement: 1 - temperature sensor (thermocouple), 2 - meter-controller TRM210, 3 - Automatic interface converter AC4, 4 – Raspberry PI

The structural diagram of temperature measurement is the following: thermocouple contacts with heated components and creates a signal. This signal is detected on controller and together with automatic interface