HOLISTIC MULTI-TOUCH SCREEN
HMI FOR THE INDUSTRIAL IoT AGE

THE WAY IN WHICH INDUSTRIES MOVE TO SMART AUTOMATION IS LEADING TO INCREASED INTEROPERABILITY AND A REVOLUTION IN HUMAN MACHINE INTERFACE (HMI) DESIGN
CONTENT

EVOLUTION OF INDUSTRIAL HMI // 4
RESPONDING TO MARKET REQUIREMENTS // 4
HMI AND INDUSTRIAL IoT (SMART AUTOMATION) // 4
KONTRON LEADS INDUSTRIAL IoT HMI REVOLUTION // 5
SUMMARY // 6
THE WAY IN WHICH INDUSTRIES MOVE TO SMART AUTOMATION IS LEADING TO INCREASED INTEROPERABILITY AND A REVOLUTION IN HUMAN MACHINE INTERFACE (HMI) DESIGN

Day by day, as the Industrial Internet of Things (IIoT) starts to make an impact, automation is becoming ‘smarter’. What until recently was seemingly impossible to achieve on the factory floor is quickly becoming reality, as previously fragmented and disparate systems become increasingly integrated and interconnected on more functional and interoperable platforms.

Smart Automation will deliver measureable productivity benefits, reduced operating costs and more informed decision making, not only on the factory floor, but in energy utilities and across many other industrial sectors. However, the ongoing convergence of man, machines and industrial computing applications will accelerate dramatically in the near future as the full force of IIoT-scale hyper-connectivity takes hold. This undoubtedly presents new challenges for HMI systems designers even though considerable advancements have been made in recent years.

Despite faster, more powerful computer processor technology, graphics and communications, there has remained a crucial missing link in optimising industrial HMI design and functionality. Key to the future visualisation and control of the new Industrial IoT ‘ecosystem’ will be the ability of HMI systems to seamlessly deliver users real-time, holistic views of entire production processes, from individual factory floors to multiple plants. At the same time users will demand easy, precise control and operation of machinery and applications – all from a single point of access. Only then will organisations be truly empowered to take full advantage of Smart Automation in the IIoT age.

This whitepaper discusses emerging HMI IIoT design requirements from industrial solutions OEMs and designers who are striving to meet the demands of manufacturing, energy and other industrial customers as they prepare for Industrial IoT. As part of this, it examines the strategic importance of taking a holistic approach to HMI integration and presents the advantages of deploying Kontron’s latest generation of multi-touch screen HMIs for enabling IIoT solutions for Smart Automation.
EVOLUTION OF INDUSTRIAL HMI

The progress in HMI usability and functionality has not been as rapid in industrial automation as in the consumer world. The past decade has witnessed considerable advancement in the integration of more powerful HMIs. After all, it was not so very long ago that HMIs were mostly stand-alone computer terminals directly attached to machines, or simply switch, lever or push button devices.

The past decade, however, has witnessed considerable advancement in the integration of more powerful HMIs. This is because there has been a rapid transformation in the way we interact with information technology in our everyday lives. From ATMs and information kiosks to games consoles, tablets and of course smart phones, integrated touch screen displays play a vital part in this. We now take for granted how simple to use these often highly functional devices have become.

Today computerised HMI systems are widely used in manufacturing, from the automotive industry to the highly regulated pharmaceutical and food industries. Oil, gas and mining organisations also depend on HMIs for remotely managing multiple processes from control rooms.

RESPONDING TO MARKET REQUIREMENTS

Many more users in industrial environments now also expect HMIs to provide a similar intuitive, touch experience as their smart phones. In the last few years, this requirement has driven considerable innovation in industrial HMI design with touch screen solutions becoming increasingly adopted in manufacturing environments.

For enabling touch screen interaction there are a number of technologies available including Resistive Touch and Projected Capacitive Touch (PCAP). However, PCAP offers additional multi-touch gesture flexibility (for pinching, sliding, rotating) combined with pinpoint accuracy, even with work gloves. PCAP’s greater screen durability can also be an advantage when deployed in harsher industrial environments. This is due to the use of metallic coated panels which also provide enhanced light transmission for clearer, brighter displays.

In order to derive maximum business benefits and competitive advantage in the rapidly emerging, massively connected Industrial IoT world, it is necessary to develop and design more advanced, totally integrated HMI solutions. Systems that successfully combine the very latest modular industrial multi-touch screen technology with the most powerful, reliable and scalable computer controller modules. For maximising lifecycle management and for ensuring low total cost of ownership (TCO), these next generation HMIs will need to provide a large choice of connectivity options to suit all Smart Automation requirements while allowing easy upgrade paths for taking advantage of future generation processor, graphics and mass storage technologies.

HMI AND INDUSTRIAL IoT (SMART AUTOMATION)

The Industrial IoT led transformation of industrial automation to Smart Automation highlights the critical need for a more holistic, scalable and interoperable approach. This is to ensure that end users can realise maximum ROIs from their legacy, current and future industrial systems infrastructures and plant.

Undoubtedly, as the Industrial IoT continues to permeate the plant floor, HMIs will be instrumental in enabling Smart Automation to fulfil its maximum potential. These must provide users with the ability to more closely supervise production and respond to changing production demands with absolute precision.

Streamlining operations through single access points will become essential for improving timely decision making as well as speed and accuracy, resulting in enhanced control of factory production, increased operational efficiencies, and optimised computing performance for production data analysis.

SCADA and MES Integration

At the same time the connecting of people, machines, sensors and other devices on an unprecedented scale will create vast volumes of usable ‘actionable’ data. With this comes the increased need for HMIs to integrate with and maximise the full potential of the latest and future SCADA and Manufacturing Execution Systems (MES) applications, ensuring in-depth, real-time evaluation of entire production lines, across individual and multiple sites. The availability of advanced HMI technologies helps prepare the industrial sector for the Industrial IoT age by literally placing the full power and productivity of the latest smart automation applications right at the user’s fingertips.

In addition, as the Industrial IoT massively increases the number of data points, both locally and remotely, HMIs must be capable of securely sending Operational Technology (OT) data from the plant floor to Cloud and Enterprise IT systems.

The IoT will also demand extensive HMI data visualisation capabilities providing clear visibility into even the most inaccessible areas. This will allow real-time insights into the status of plant and machinery, leading to improved user productivity and diagnostics, which in turn will reduce risk of system failure and unplanned downtime.
Kontron has proven experience in designing and manufacturing advanced HMI solutions for a diverse range of industrial systems, including the chemical, pharmaceutical, food and beverage, energy and power industries.

Future-proofed interoperability
As part of its ongoing R&D program, Kontron has designed a totally new family of HMI solutions, a crucial part of the company’s Industrial Computer Platform strategy. The Kontron FusionClient is a robust, scalable HMI solution based on the company’s revolutionary and holistic approach to HMI design and Smart Automation. This ensures future-proof interoperability between legacy and new automation systems and plant machinery, all of which can be controlled and viewed via edgeless, single pane of glass multi-touch displays.

Powered by the proven performance, scalability and flexibility of the Kontron COM Express® Computer-on-Module, Kontron’s latest HMI solution is ideally suited to service, automation, process and quality control applications across a wide variety of factory production lines, as well as in energy utilities for the monitoring and optimisation of supply grids.

Extensive connectivity
With the growing importance of sharing Operational Technology (OT) Data with on-premise or cloud-based Enterprise IT Systems, and to meet the requirements for comprehensive data visualisation, FusionClient is WiFi-enabled for seamless connectivity with plant machinery and other connected devices on the plant floor.

The unique placement of the FusionClient’s WiFi antenna directly behind the glass front ensures full bandwidth even when the HMI is mounted in a metal cabinet door. An innovative LED alarm bar for providing machine status alerting, even when the display is dimmed, is a further example of Kontron’s commitment to ensuring an enhanced user experience. RFID readers can also be mounted behind the glass for enabling highly secure user access.

Longevity and low maintenance
As part of Kontron’s IIoT ready Industrial Computer Platform family, FusionClient automatically benefits from Kontron’s inherent and innovative ‘wartungsfrei’ (maintenance-free), modular and scalable design architecture. This offers customers maximum product availability, reliability, and reduced TCO/lifecycle management while providing total flexibility for easy customization and upgrading to future processor generations.
**Summary**
Kontron has a thorough understanding of customers’ growing and changing requirements as they prepare for Smart Automation. These demand innovative HMI systems which enable highly efficient manufacturing and production processes which can be changed at short notice with minimal disruption and downtime. Kontron’s systems ensure reduced maintenance (’wartungsfrei’) to enable optimised TCO but without sacrificing any of their innovative potential.

Providing holistic, single pane of glass views of the entire production process across individual or multiple sites, the latest Kontron FusionClient HMI solution enables increased productivity and more informed and timely decision making. Users will also enjoy easier and more precise operation of machinery and applications, with and without gloves, thanks to the specification of Projective Capacitive Touchscreen (PCAP) technology and support of a wide range of touch gestures.

For more information about Kontron multi-touch HMIs and how they enable Industrial IoT (IIoT) solutions for Smart Automation visit [http://www.kontron.com/industries/automation](http://www.kontron.com/industries/automation)
About Kontron

Kontron, a global leader in embedded computing technology and trusted advisor in IoT, provides a complete and integrated portfolio of hardware, software and services. Kontron creates many of the standards that drive the world’s embedded computing platforms, bringing to life numerous technologies and applications. The result is an accelerated time-to-market, reduced total-cost-of-ownership, product longevity and the best possible overall application with leading-edge, highest reliability embedded technology.

Kontron is a listed company. Its shares are traded in the Prime Standard segment of the Frankfurt Stock Exchange and on other exchanges under the symbol “KBC”.

For more information, please visit: www.kontron.com

---

CORPORATE OFFICES

EUROPE, MIDDLE EAST & AFRICA

Lise-Meitner-Str. 3-5
86156 Augsburg
Germany
Tel.: +49 821 4086-0
Fax: +49 821 4086-111
info@kontron.com

NORTH AMERICA

14118 Stowe Drive
Poway, CA 92064-7147
USA
Tel.: +1 888 294 4558
Fax: +1 858 677 0898
info@us.kontron.com

ASIA PACIFIC

1~2F, 10 Building, No. 8 Liangshuihe 2nd Street,
Economical & Technological Development Zone,
Beijing, 100176, P.R.China
Tel.: +86 10 63751188
Fax: +86 10 83682438
info@kontron.cn