



Currently trending: customised user interfaces for medical devices

Control systems in the OR

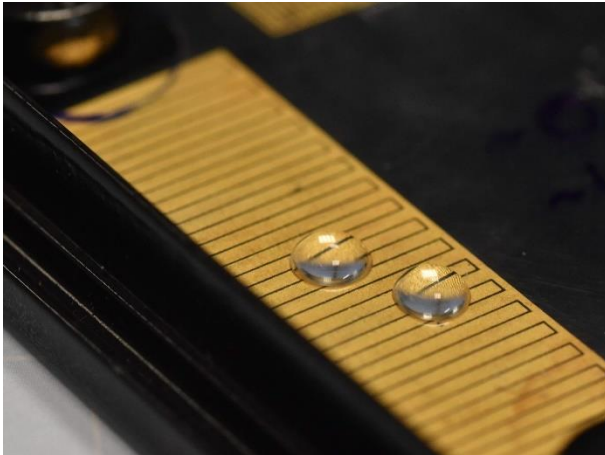
Customised user interfaces

The proportion of control systems which are customised is growing rapidly. Preparations for the interoperable OR, where multiple medical devices are controlled via a central user interface, are also progressing at full speed. The benefits of customised user interfaces will be explored in this article.

Cabled or wireless, standard or customised: these are the choices which medical device manufacturers face when defining their desired user interface.

The majority of manufacturers now opt for wireless communication between their

medical device and its user interface. The benefits are obvious: remote control foot switches without cables are state of the art, more hygienic and easier to clean. They can be positioned without any cable-induced restrictions and are thus ergonomically comfortable



One of the benefits of customised user interfaces is the incorporation of new technologies and the integration of sensors – here to monitor damp inside enclosures.

to operate. Moreover, there is no risk of cable damage through inappropriate handling. This decision is also forward-thinking with regard to the interoperable OR of the future. For this task, steute Meditec has developed SW2.4LE-MED, a safe wireless protocol specifically for the requirements of medical technology.

Parallel to the trend towards using wireless technology for user interfaces in the OR, there is an equally clear and increasing trend towards customised controls and/or controls designed specifically for individual applications. This trend can be observed across a wide range of medical disciplines and for all manner of medical devices. Here, too, there are multiple reasons for this development.

The desire to stand out

It is the user interface which operators directly interact with when handling a medical device. This is why features such as comfort, ergonomic design, intuitive operability, as well as optical and haptic quality, are so important. Collaboration with a specialist means that the user interface can be designed in line with the corporate image of the manufacturer and the "look and feel" of the medical device.

Technical and ergonomic adaptation

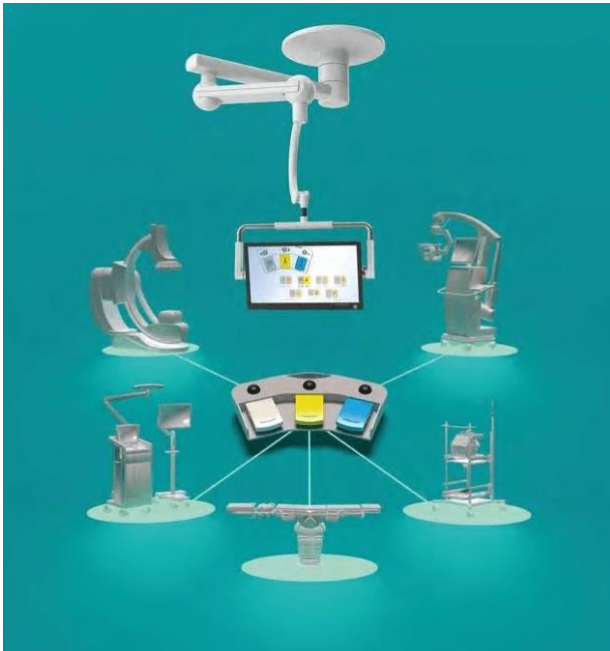
If the user interface is customised, not only its design and ergonomic comfort, but also its functions can be adapted to suit the medical device in question. This is true of physical features, such as the dimensions of the overall control, the number and size of the actuators, as well as their type (pedals, push buttons, joysticks) and arrangement. Operational features, such as tactile feedback, battery size and type, as well as design and colour, can also be individually determined.

At the software level, device manufacturers also have a wide range of options. They include definition of the interface to the terminal device. Moreover, manufacturers can define – depending on the risk class of the application – the necessary safety class for the software to IEC 62304, if required up to safety class C. The user interfaces are then tested by steute Meditec according to these criteria and the results documented. As an optional extra, steute can also support customers in maintaining the standards required by the markets in which their medical devices are distributed.

The majority of user interfaces are customised and communicate with their medical devices via remote control.

Lean and rapid development

Working with a specialised company experienced in user interface development and project management means that the design department of the device manufacturer can concentrate on what it does best – development of the medical system.



The future: the interoperable OR

Preparations for future technologies – e.g. interoperable OR and SDC – can be taken into account early on and be already integrated in the controls.

Reduced documentation time

An additional benefit which should not be underestimated considering the time and effort necessary in the run-up to the market launch is that a specialist can relieve the device manufacturer regarding not only the project management, but also the documentation and certification of the user interface. Depending on the market(s) for which the medical device requires approval, this effort can be considerable.

Cross-device uniformity

If a medical device manufacturer co-develops and uses a customised universal user interface, this could render superfluous multiple switch models used to date, in turn bringing benefits with regard to storage and – even more importantly – approval processes.

Using the latest technologies

With a customised user interface, manufacturers can compile their own technology packages and incorporate state-of-the-art functionalities. Just one example: as part of a project with the cluster of excellence "Intelligent technical systems – it's OWL", steute has investigated technologies permitting integration of sensors for measuring damp in foot switch enclosures.

Thus, user interfaces become "mechatronic integrated devices" (MID) and can transmit signals in the case of a malfunction or assume a safe state. Analysis capability is improved since the leak tightness of foot switches can be monitored during running operations. The corresponding developments have already been completed, and one of the investigated technologies will soon be optionally available.

Well prepared for the interoperable OR

When Service-oriented Device Connectivity (SDC) becomes reality in the near future and medical devices in the OR become interoperable, this will have a considerable impact on the user interface. Diverse medical devices can then be controlled using a single central unit and a screen for visualisation. A correspondingly configured and customised user interface optimally meets this requirement.

For many years, steute Meditec has been involved in the development of control systems

DeviceMed INFO

What is a user interface?

A user interface is the **interface between operator and machine, or operator and computer**. The interface permits both hardware and software to be managed. In order for a user interface to be viable and usable for human beings, it must be **intuitive, ergonomically comfortable and efficient**.

for the interoperable OR and is currently working on further developments for the state of the art, e.g. real-time communication between the interoperable user interface and the corresponding medical devices (real-time SDC).

Conclusion: benefits for device manufacturers and users

This overview shows: use of customised user interfaces in the OR can provide diverse benefits. Here they have primarily been

described from the standpoint of medical device manufacturers, but they also hold true for device operators in the OR. The latter can profit from e.g. ergonomically comfortable and intuitive operating processes, specifically adapted to suit the medical device in question. This option should therefore be investigated whenever the development of a new medical device is at stake. As an alternative, a comprehensive and standard range of control systems which has also been developed especially for the requirements of medical technology is readily available.

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