

Cloud for flat-panel controllers and RFID readers

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The first cloud for flat-panel controllers offers full connectivity to enable central parameterization and constant monitoring of the operational status of displays. This brings two clear advantages: higher ease of use and lower maintenance costs.



Figure 1. Thanks to the eCOUNT eCLOUD for flat-panel controllers, there's no more need to climb ladders to configure your monitors. You can simply use your smartphone instead.

■ Industrial-grade OEM flat panels are used in many types of implementations, from large-scale digital signage solutions to medical monitors that hang over operating tables to embedded displays in many other industrial devices, machines and systems. That's why every OEM needs an application-specific controller that provides the necessary intelligence to process the respective video signals. It further supports display peripherals, such as the provision of sound and touchscreen functions and RFID readers, as well as the definition and storage of user-specific parameters such as brightness, contrast, gamma correction and color representation.

Wherever much configuration and parameterization is required, a user-friendly interface is highly welcome. Parameterizing a monitor via an on-screen display is only the minimum requirement in such cases. These days, OEMs and users want a lot more. The operator of a system catering menu board does not want to climb up a ladder to manually optimize the settings. He prefers a contactless method. A remote control would work, but it is all too easily lost, especially if used only sporadically. A better solution would be to provide an app for smartphones and tablets with a local WLAN or Bluetooth connection, similar to modern state-of-the-art TV sets. However, for the operator of several branches such a solution is not good enough. He wants to be able to distribute the settings to all stores with a few clicks. It goes without saying that it is not only the operators who demand this;

OEMs from many other sectors also appreciate the same level of comfort. They too want to be able to centrally monitor and conveniently configure their settings, such as the luminosity of the display when a set threshold is exceeded or undercut, and parameterize alarm scenarios, for example, to send an SMS to a service technician if the image source fails.

Today, the use of proprietary programming devices that require special cables for the connection of devices and costly on-site service is an unpopular solution. Instead, users and OEMs want to be able to leverage clouds and navigate a monitor via IP addresses to centrally manage and maintain their displays. Ideally, the cloud provides an HTML-based, responsive interface so you can use any client that supports a browser, from smartphones to tablets to desktop PCs. Everything can then be connected to this central cloud – from new displays in a wide variety of locations, alarm management systems with escalation routines and acknowledgment functions, to the integration of back office, ERP and CRM systems as well as content delivery platforms. For this purpose, eCOUNT embedded has developed a device-independent cloud solution with HTML interface for intelligent flat panel display controllers. This solution is first made available for the new CRTtoLCD-91 flat panel controller with 4K UHD support. As an industry first, the solution also integrates an optional RFID reader, making it possible for the display controller, and therefore also the flat screen of a system, to assume a central role

in authorization management. Since device, machine and system functions are nowadays almost exclusively accessed via touch displays and their peripherals, this is a highly efficient solution. For example, systems can be configured to boot by default with the screen off, and only turn on the display and/or touch function when an approved tag is detected. Once it is possible to centrally monitor the display usage or to manage authorization and user-dependent configurations centrally via clouds, even payment systems for pay-per-use applications can be connected. But OEMs do not have to go all that far in order to profit from the easy connection of display controllers to the cloud.

For example, the ability to track display temperature to avoid damage from overheating by proactively dimming the display is a very efficient way to make predictive maintenance even more effective. If the GPIOs that are part of the flat screen can also be configured and/or reset remotely, installation becomes more efficient as well: all that's needed is an on-site mechanic. The system can be conveniently configured from a cloud workstation anywhere in the world. By tracking switch operation and other analog inputs, it is also possible to gain valuable insights into the usage of the flat screens and their applications, plus the systems can always be kept up to date via remote firmware updates. By tracking operating times along with temperatures, predictive maintenance can be planned much more precisely with the help of MTBF calculations.



Figure 2. The eCOUNT eCLOUD offers comprehensive dashboards and a management system with which distributed flat screens can be administered centrally.



Figure 3. The first intelligent flat-panel controller with eCLOUD support is the new 4K CRT-toLCD-91 board.

The more distributed systems are installed, the more OEMs and operators benefit from a central cloud as it simply provides more convenience and services at more affordable prices. When the optional RFID reader for the display controller is also connected to the cloud, there are many more benefits. The use of specific RFID tags can then be authorized or denied from a central location, which makes authentication and authorization management highly efficient – for example, by grading into categories of simple users, experts and maintenance personnel. When RFID tag usage is tracked, OEMs can also develop completely new deployment scenarios, such as the

mentioned pay-per-use model. However, the RFID reader can also be used to simply call up a by user-preconfigured personal monitor settings, for example by selecting the desired settings from a step-by-step questionnaire via a cloud interface. Such individual settings are particularly popular in the medical field, because colour perception differs from person to person, so that one doctor may prefer a completely different configuration than the other. It is also easy to activate a DICOM Part 14 compliant display, for example to detect a carcinoma beyond doubt. When such configurations can be managed centrally, it becomes possible to assign them to specific endoscopic

devices or even diagnostic situations. Being able to centrally manage and distribute such settings opens up potential for new services.

So there are many OEM-specific uses for cloud-connected display controllers. A flat screen could even be used to log production data from customer projects, which could then be visualized via the cloud and passed on to ERP systems. A cloud-connected flat screen can be so much more than a touch-based graphics interface for man-machine communication. Providers of cloud-connected display controllers are therefore opening up entirely new, purely software-based sales opportunities for OEMs.

Version 1.0 of the eCOUNT eCLOUD for flat-panel controllers supports the 30 most popular features. These include input selection, mode, temperature, operating hour counter, power-on and, of course, all API functions such as backlight, brightness, contrast and audio volume as well as panel info and reset. When the RFID reader is integrated, the scope of functions expands to include additional RFID reader specific commands that can be triggered from the IoT platform. In the future, the cloud will be extended in version 2.0 and 3.0 to include further functions. Scheduled for release by the middle or end of 2018, version 2.0 will provide full support of all display controller and RFID reader APIs along with campaign management for the distribution of new settings or firmware. 2G/3G/4G interfaces will be supported, as well as a software development kit for the cloud gateway with integrated rule engine. As a result, this version will support all functions required for first field deployments. Version 3, which will go into development from the second half of 2018, will include interfaces to ERP solutions such as SAP or SQL, as well as dedicated apps for iOS and Android. At that point, the extended management portal with customizable dashboards and widgets will also become available.

The new eCLOUD for intelligent display controllers can be used with private or public clouds. Interfaces to all leading common cloud platforms such as Amazon, Google or Microsoft Azure are being added step by step. Upon request, the manufacturer can also provide additional, customer-specific cloud interfaces, so OEMs can always use their own specific cloud environment. The roadmap already includes solutions from embedded computing vendors such the WISE-PaaS Edge Intelligence Platform from Advantech, or the embedded cloud from S&T and Kontron. This paves the way for rapid deployment of these display controllers to the cloud environments of leading embedded and automation vendors. ■