

HMI & Virtualization in Process Automation

Pepperl+Fuchs' VisuNet Remote
Monitors



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Your automation, our passion.

 **PEPPERL+FUCHS**

Virtualization is a technology that stems from the information technology (IT) industry and has become more and more popular in process automation. Virtualization promises to ease software management while reducing costs. This trend also has an impact on the human machine interaction (HMI) in such systems. Especially in combination with thin client technology, virtualization provides an easier and cost-efficient way to control process automation systems even in the harshest industrial environments.

In this technical white paper series, *HMI & VIRTUALIZATION IN PROCESS AUTOMATION*, we give an overview on virtualization in process automation and describe how Pepperl+Fuchs' thin client technology fits into virtualized systems.

In technical white paper No. 1, we give a closer look on virtualization technology. We focus on the back end and show how virtualization works and what benefits virtualization offers in process automation.

Technical white paper No. 2 describes thin clients, how they work, what their general advantages are, and which role they play in a virtualized process automation system.

In this technical white paper No. 3, we present the P+F remote monitors which are industrial thin client solutions that help to save time and money during installation and operation and offer broader/more functionalities than other technologies.

Dr. Marc Seißler,
Product Portfolio Manager

What are Pepperl+Fuchs' remote monitors?

For many years, Pepperl+Fuchs has offered a broad range of industrial-grade HMI systems that consist of highly robust components that withstand harsh environmental conditions like dust, high temperature ranges, washdowns, explosive atmospheres, and so on. (See Figure 1.)

In the P+F VisuNet product line, different technologies – like PC-based, KVM-based, and direct monitors – are available that offer high flexibility and address different application needs.

One of the main technologies in the VisuNet portfolio are the VisuNet remote monitors (RM).

A core innovation of the VisuNet RMs, which were introduced by P+F in 2007, is the use of thin client and standard Ethernet technology for accessing process automation systems.



Figure 1: P+F remote monitors are thin client solutions for demanding, industrial applications

In contrast to conventional thin clients, the integrated thin client in one of our RMs is based on industrial-grade hardware that has no moving parts built in and is rated to withstand wide temperature ranges, shock, and vibrations and is suited to be used in hazardous locations with explosive atmospheres.

Furthermore, to fulfill the special demands of process automation applications (e.g., security and system integration), VisuNet RMs run their own thin client software, called RM Shell that is engineered by P+F.

With the introduction of the RM Shell 4.0, the next generation of software is introduced that is perfectly tailored for virtualized process automation systems. (See Figure 2.)

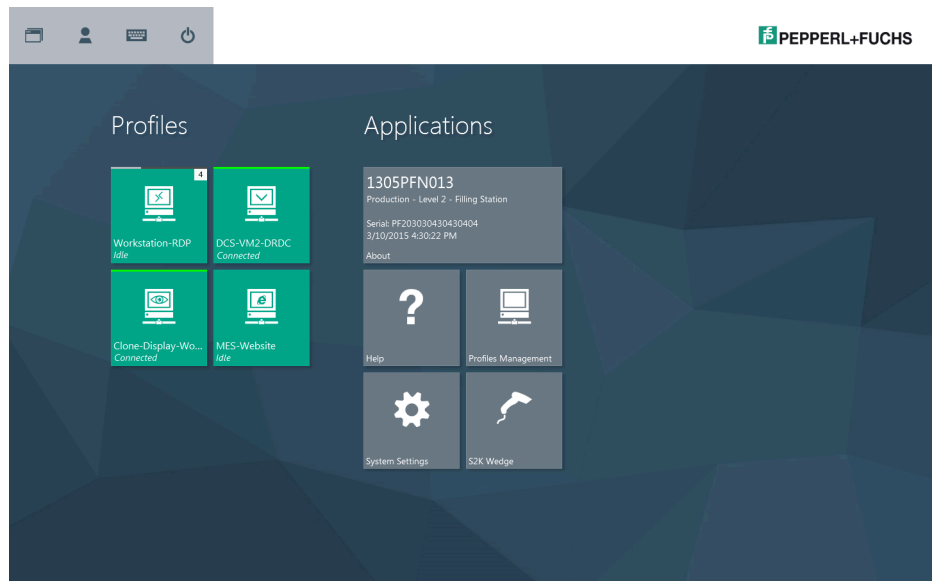


Figure 2: Pepperl+Fuchs' RM Shell reduces complexity for operators and system engineers

The P+F RM Shell reduces the complexity of the user interface to a minimum and is tailored to support the users' tasks. (See Figure 2.) The system is optimized to set up remote protocols that enable the connection to the host systems in the safe area via Ethernet. One big benefit of the RM Shell is that it hides the system complexity from the user and offers several features that optimize the remote connection, e.g., with automatic logins, connection loss detection, backup connections, etc.

In the next section, the benefits of the VisuNet remote monitors are highlighted in detail.

Benefits

VisuNet RMs offer many benefits compared to other HMI solutions and can help you reduce the total cost of ownership of your automation system.

Reduced integration and maintenance effort

One key benefit of VisuNet RMs is that they help in reducing the installation and maintenance time to a minimum.

Besides the mechanical and electrical device installation, the integration of an HMI system into the process automation system poses another challenge for process engineers.

With the trend toward virtualized automation systems, which use different remote protocol types and configurations, integrating the HMI system into the process automation system demands even more IT expertise.

VisuNet remote monitors are optimized to support process engineers during the integration of the VisuNet RM into their virtualized process automation system. VisuNet RMs not only support the latest remote protocols that are used for connecting to virtualized systems, they also provide simplified access to the relevant system settings and information that are required for the integration of a VisuNet RM in any process automation infrastructure with the optimized RM Shell user interface. One of the core features is, for example, a harmonized remote protocol editor that

guides the user through the configuration steps. (See Figure 3.) This simplifies the set up for automation engineers with limited IT expertise.

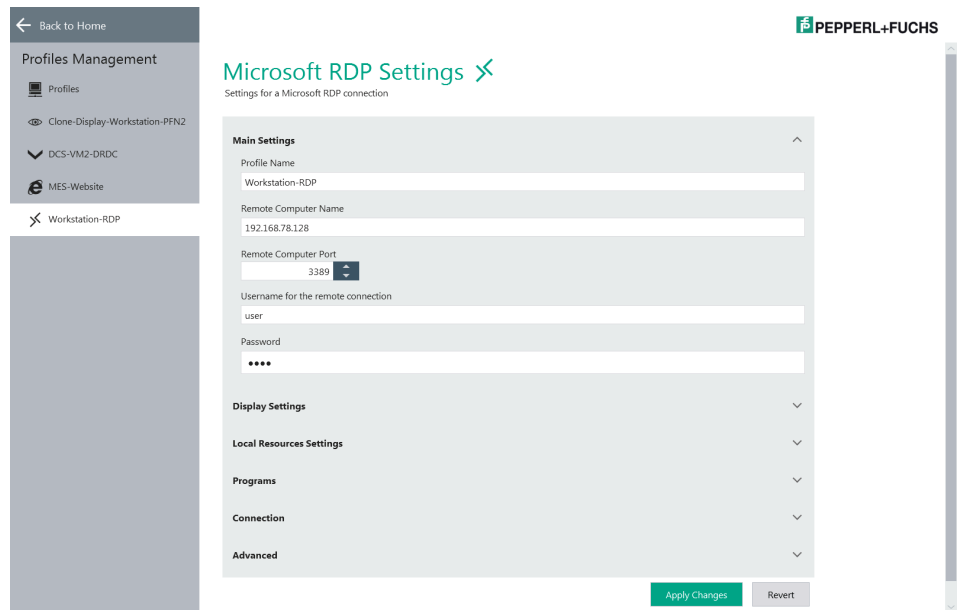


Figure 3: Harmonized remote protocol editor eases system integration

The support of centralized firmware updates of the VisuNet RMs further reduces the maintenance efforts for the process engineers.

Extended security

Besides the easy HMI set up, system security plays a vital role in process automation systems.

VisuNet RMs address this need with different features, which make RMs one of the securest HMI solutions in the market.

All VisuNet RMs run a P+F RM Shell that is based on a tailored Windows-embedded operating system (OS). The RM Shell uses different mechanisms of the OS, like the Enhanced Write Filter (EWF) that prevent the local storage of any data or even viruses and other malware.

A USB lockdown mechanism, a built-in Ethernet firewall, and password-protected VisuNet RM settings also help to make the system resistant against external manipulations.

Advanced features like a built-in factory reset makes it easy to reset the system in case of a misconfiguration.

Superior performance & user experience

While the RM Shell helps the process engineers integrate the VisuNet RM into the process automation system, the operators also benefit from the tailored UI.

Predefined user roles (administrator, operator, and engineer) help to distinguish between different information levels and provide tailored information access.

While administrators have access to all remote monitor system information and are supported in the VisuNet RM integration process, the operator and engineer modes allow setting up different usage scenarios.

The engineer mode enables the users to partially setup the RM and to start and close different, predefined remote connections.

The operator mode is intended for more restricted system access. In the latter mode, the system can be configured to automatically connect to different, predefined host systems directly after system start. The users do not need to intervene, which helps to set up a highly robust HMI system.

Features like auto-connect, connection loss detection, and backup-connection, which work for different remote protocol types, further contribute to the overall system robustness, and increase the user experience of the VisuNet RM systems.

High flexibility

Since the RM Shell includes a broad range of integrated remote protocols, like Microsoft RDP, VNC, etc., the VisuNet RMs can be easily integrated into multiple virtualized and nonvirtualized automation systems.

Furthermore, the RM Shell uses an app-concept, which allows the integration of additional third-party remote protocols and applications. This concept enables especially OEMs to adapt VisuNet RMs to their specific process automation infrastructure by integrating their own apps.

Conclusion

Pepperl+Fuchs' VisuNet remote monitors are industry-grade, thin-client solutions that are tailored for process automation systems. Due to the use of standard Ethernet technology and the latest remote-protocol technology, VisuNet RMs are suited for the latest, virtualized process automation systems.

The tailored, simplified user interface, called RM Shell, developed by P+F, supports the process engineers during the system integration. Extended features like auto-connect mechanisms and backup connections further allow the set up highly robust HMI systems.

Security features like enhanced write filters, USB lockdown, firewall, and password protected configuration settings make the VisuNet RMs highly reliable systems.

