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Adaptable SOAP based client for diagnosis and control of embedded measurement devices

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The technologies of the computer systems nowadays increase fast and enter upon a new stage every day in the human activities. This has established adequate and convenient way to access and control the system in every work sphere. The software development, corresponding to concrete system requirements, can not meet the fast progress needs, because it requires time and resources. Most measurement embedded systems need software client, for providing access to the system and system processing. The development of specific client for every system is expensive and ineffective.

The present Master Thesis gives one possible solution to that problem by developing of universal client for system function access and diagnostics of embedded measurement system. The developed client give the system data, the instruments for working with the system which work with, as well as a convenient way for the system configuration and management. The client functioning is based on extraction of needed metadata for device controlling from itself.

The communication between the client and the system is done by communication protocol, based on SOAP. The developed protocol offers a few methods, which ensure access and management to all system functions. The management is realized by changing system control parameters (called properties). The protocol gives devices, by which the operator is possible to involve efficiently in the system work and to dispose the parameters of the used algorithms for optimal results, too. The protocol offers the

possibility to keep track of the intermediate and the final results of eventual signal processing during the work of the system.

Based on the data during system processing, received by the communication protocol the client application gives a universal graphical interface for system diagnosis and management. The system structure is shown as hierarchy by the extracted properties. Everything that the client displays in the graphical interface is defined by the current device which the client works with. The operator has the opportunity to change the parameters and algorithms of the system by changing the value of the properties of the system. This is comfortable way for him/her to involve effectively in the system work and optimizing the results. The property value changed is made, based on the property type. The clients also shows data, received from the work of the devices and intermediate results, too. This is realized by group of methods for working and visualization of stream data, coming from the system. The stream data of the system are displayed in fixed places (sections) in the graphical interface. Another important characteristic of the client application is the opportunity for the user for remote execution of commands on the device. This is achieved by command buttons, disposed in the graphical interface of the client application. When a button is clicked, a corresponding command is executed in the system and the result of the execution is committed to the user.

Client architecture: the client application can be relatively divided into three basic modules:

- module for visualization and changing of system properties
- module for stream data visualization
- module for remote system execution

The client application is tested by two systems – Camera for welding robot management of the KDS Company and System for micro measurements, developed in the Chemical faculty of SU “St. Kliment Ohridski”. The client reacts adequately and presents correctly the characteristics and properties of the both systems.