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## ITER Upper Visible/Infrared Wide Angle Viewing System: I&C design and prototyping status

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The ITER Upper Visible/Infrared Wide Angle Viewing System diagnostic will provide key measurements for machine protection and plasma control. The system, installed in five upper port plugs, will monitor the ITER divertor but also part of the ITER first wall using both high definition infrared and visible cameras typically running at 100 Hz. The plant system I&C will process about 40 Gb/s of imaging data acquired by the cameras installed in the port-cells up to 200 m away. Then surface temperature of plasma facing components will be computed and abnormal event such as hot spots or ELMs will be detected using dedicated algorithms implemented on fast controllers. Relevant data will be sent to plasma control system and to ITER archiving system for further offline analysis.

This papers focus on the I&C design for camera control, data acquisition electronics and analysis software. The current progress on I&C design following the ITER methodology for plant system I&C design is presented, including operational procedures, use cases, user and functional requirement tracing, functional analysis and plant I&C architecture. All design documents have been prepared using the Enterprise Architect software with dedicated plug-ins provided by the IO.

In parallel, prototyping activities related to real-time image processing and high throughput camera data acquisition using a 10 GigE interface have been carried out for the preliminary design review. The goal is to demonstrate some key functions of the system using state-of-the-art techniques adapted to the specific context and needs of the diagnostic. Emphasis is put on current challenges related to real-time computation and archiving of large amount of data.

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