The ATLAS Pixel Detector consists of 4 barrel layers and three disks at each side. During the long LHC shut down period it was upgraded via the insertion of a new layer (IBL) and the replacement of the on-detector services. The IBL is the innermost layer of the Pixel detector. It consists of 14 staves equipped with 32 Front-End (FE) read-out chips. The FE's are grouped into modules for the DAQ operation. The modules are electrically connected to optoboards that handle the electrical-optical conversion. The data flow runs through optical fibers to the cards: Back-Of-Crate (BOC) and Read-Out-Driver (ROD - now with a new PowerPC and modern FPGAs).

The ROD is the main board, taking care of:
- data format and monitor
- receive commands from the host
- create and send FE commands
- An external Fit Server analyses the histograms produced during calibration.

A Single Board Computer (SBC) controls the ROD-BOC cards. The BOC receives Time, trigger and control (TTC) from the TTC Interface Module (TIM) and sends data to the higher level read-out (ROS). Remote access to the system is possible through Ethernet connection.

**Read-out chain – Hardware infrastructure**

**Read-out chain – Software infrastructure**

The Pixel DAQ is a collection of applications to operate and configure the Pixel detector; it interfaces with the ATLAS TDAQ software.

The Run Controller connects all functional blocks with each other.

Tasks (e.g. a scan) are called “Actions”, started by the host and handled by “Action Servers” on the Single Board Computer (SBC).

Threads are processed at the same time via inter process communication (IPC).

The coordination via VME is handled by the Crate Broker.

**Data taking**

The IBL detector was gradually included into the combined ATLAS data taking during the last months. The off-detector read-out chain was initially tested with emulated data, in order to factorize out the FE-detector problems. The commissioning of the IBL detector was successfully performed using the ATLAS cosmic data taking, including all the 14 staves. The read-out system was tested successfully up to the nominal ATLAS trigger frequency (100 KHz).

Recently LHC delivered the first collisions and the Pixel DAQ was able to read-out the entire detector without major issues.