DOT data-acquisition datasheet

The DOT data-acquisition equipment is designed and build for the Dutch Open Telescope on La Palma by the "Instrumentele Groep Fysica" of the University of Utrecht.

Hardware Equipment	
Data-acquisition hardware	1 Control Workstation
	5 Framegrabber-servers
	5 Framegrabbers
	5 Fiberlinks
	5 Camera's
	1 Tape device

The 5 recording units are fully equivalent There is no difference in performance or function between them. One recording unit consists of a camera, fiberlink, framegrabber and framegrabber-server.

Hardware Units	
Framegrabber-server	Compaq Proliant ML350
	Dual Pentium III, 600 MHz
	Total amount: 5
Disc capacity framegrabber-server	72 GB
	Total capacity: 360 GB
Control workstation	Compaq Workstation AP400
	Dual Pentium III, 600 MHz
Tape device	Mammoth II autoloader
	Exabyte EZ17
	Capacity: 420 GB
Camera	Hitachi KF100
	Total amount: 5
Framegrabber	Imaging Technology IC4-DIG16
	Total amount 5
Fiberlink electronic components	Bi-directional fiberlink connections
	Hotlink transceiver/receiver, Xilinx
	FPGA, 4 layer PCB
	Total amount: 5
Fiberlink cable and connectors	Multi Mode 62.5/125
	Length: 150m
	Duplex SC connectors

The bi-directional fiberlink is tuned for the Hitachi KF100 camera. The fiberlink contains a connection between the framegrabber-server and the camera for controlling the camera-exposure and a connection between between the camera and the framegrabber for transfering the imagedata. There is no need for extra cables. The fiberlinks are coupled to synchronise the electronic camera-shutters.

Hardware Performance	
Camera	1296x1030 pixels, 10bit resolution 6 - 12 frames/s (6 frames/s = 80Mbit/s)
Fiberlink for 1 camera connection	40 MB/s
Disc storage for 1 framegrabberserver	31 MB/s
Tape storage	Wide Ultra2 SCSI: 12 MB/s Ethernet: < 10 MB/s
Ethernet connection	100 Mbit/s

The fiberlink is designed for 12 frames/s from the Hitachi KF100 camera.
For 12 frames/s, with 1296x1030 pixels/frame and 1 pixel (10 bits) in 2 bytes, plus the Hotlink protocol, the total datarate is equal to 40 MB/s.
The tape device is connected by Wide Ultra2 SCSI to one of the framegrabber-servers.
The 5 framegrabber-servers and the control workstation are connected by 100 Mbit ethernet.

Software Components	
Operating system	Linux 6.2 kernel 2.2.16-3smp
Framegrabber driver	GOM GmbH itifg-0.7.0beta
Programming language	C, Java
Communication protocols	RPC, TCP/IP

Software Architecture	
Acquisition control	Session management Options and configuration control Recording control Peripheral equipment communication
Data Acquisition	Camera control (exposure, synchronisation) Image grabbing Storing imagedata to harddisc Sending imagedata to displayprocess
User interface and display	Camera exposure configuration Display resolution options Peripheral equipment configuration Recording options Session definition Displaying camera image data

The several independent software processes are connected by defined interfaces. Communication between processes on different hosts is based on RPC and TCP/IP protocols.
Connections with peripheral DOT equipment are based on RPC and TCP/IP protocols.
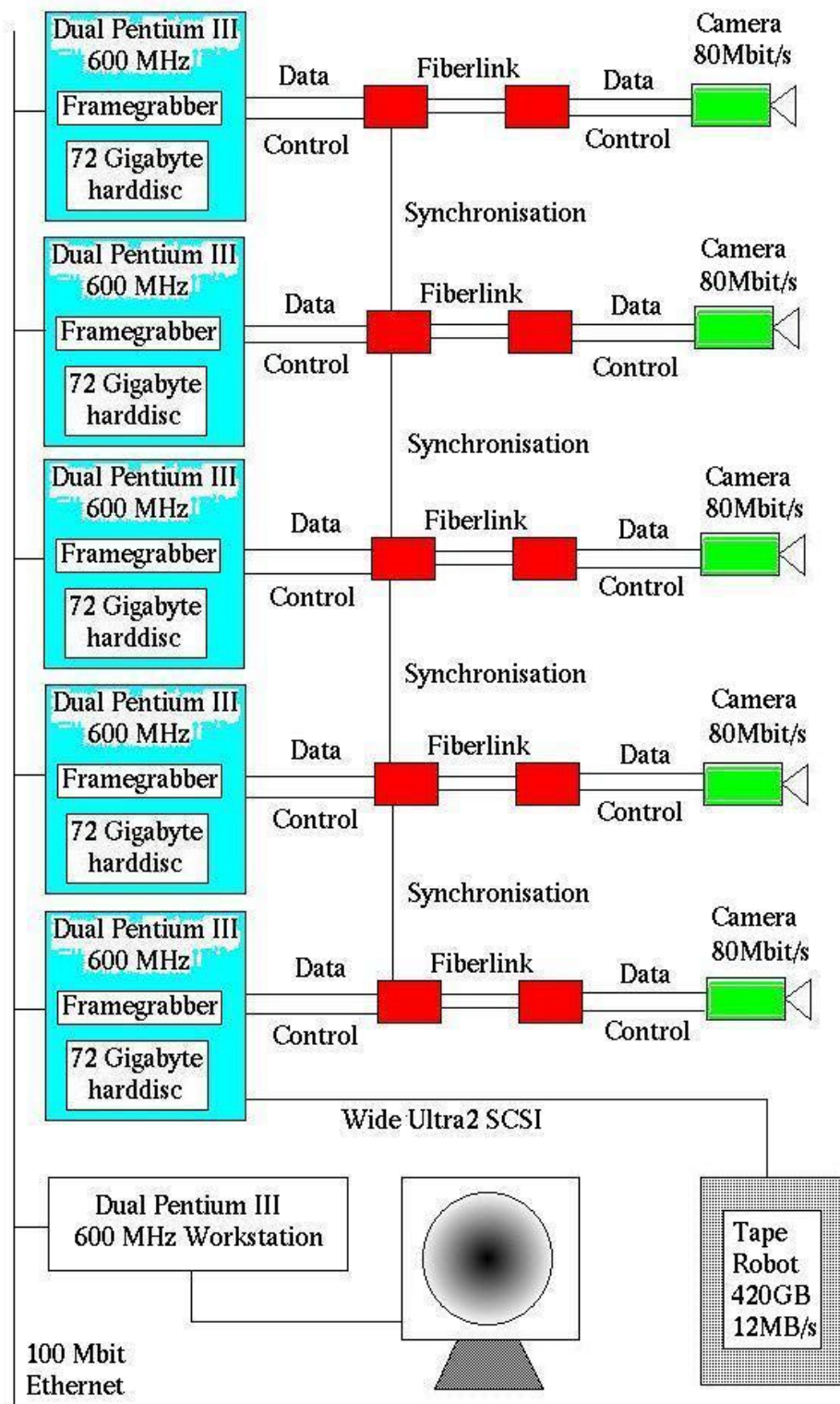
Overview DOT Data-Acquisition Equipment