

Software

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SAO Software Toolbox

- CCD/IR data acquisition servers
- “msg” ASCII client/server protocol
- Generic PMAC motion server
- GUIs built with TCL/TK

Required Components

- IR Array Data Acquisition
- MMIRS Motion Control
- Guider/WFS Camera Data Acquisition
- Guider/WFS Motion Control (x2)
- Monitoring Software

IR Array Data Acquisition

- Based on MMT CCD Camera server using EDT PCI/RCI Linux device driver
- Based around ICE with our own GUI (or standard IRAF client)
- IR Camera Extensions already developed for SWIRC

Data Acquisition GUI

Palizis	Estepow Up	Vacpow Up	Benchpow Up			
Electronic Power	lps1 on	lps2 on	estop on	Step Servers	Hstep Up	Hmed
Bench Power	steppers on	hashifter on				
CCD Power	camera on			CCD Servers	Detector Up	Keith Up
Box Power	bench off			Box Servers	Heal Down	
				Dome Servers	Domecal Up	
				Telescope	Telescope Up	
CCD temp	-119.68	-273.00	VacGauge	Vac on	ESTOP off	Shut :
Dome Lamps	Continuum off	HeNeAr off	PenRay Init			
Image Type	zero	Exposure	3 / 3	Status	IDONE	
Shut Up	Shutted Up					
	Shutter	Grating	Focus	ZeroOrder		
Clear -->	shut idle	grat idle	focus idle			
CURRENT:	closed	-1.92600	0.828075			
TARGET:						
CALIBRATION:		-1.926	.83	3.402		
ConfigBench	FIELD:	parked				
TITLENAME:	mint_15_ade	INSTRNAME:	hctospace	DIETNAME:	spec	
PROPID:	various	OBSVRS:	rafbios	P.L.:	various	
		count	exptime	intval		
dark	Go	3	9.00			
Title	CLEAR *					
PAUSE	ABORT	STOP	RESUME	CHANGE		

MMIRS Motion Control

- Cryo axes
 - Dekker wheel
 - MOS wheel
 - Filter wheel x2
 - Grism wheel
 - Detector focus (LVDT)
 - Isolation gate valve
- Guider axes
 - Focus
 - X,Y
 - WFS insert/remove
- Server will run on rack Linux computer
- Delta Tau PMAC stepper/servo controller
- Software based on MMT WFS software
 - MSG protocol
 - Standard Engineering user interface
 - Motion control server framework

MMT WFS Engineering GUI

WAVESERV	Abort	Clear	Idle	OK	Power	
Select	WFS	SciCam	Home	Stow	Camera	
Field Angle	0 "	Go	<input type="checkbox"/> Slew			
Off Axis Pos	0 mm	Go	0.0	4.5	Puntino PHome	
Mirror Pos	0 deg	Go	0.0	0.0	Ref Pos Sky Pos	
Focus Pos	0.000 mm	Go	0.0	19.5	Plot Status	
7078	Mirror	Trans	Select	Focus	Punt	
Actual	-0.028	-472.031	-0.007	19.498	620	
Commanded	-0.028	-472.031	-0.007	19.498		
Target	0.000	-472.000	0.000	19.500	620	
BrkAuto	Held	Held	Held	Held	Lite Off	
	+L	-L	+L	-L	+L	-L
Temperatures			CPU	39		
Motor	19.0	23.9	29.2	297.8		
Struct	-820.9	177.7	292.9	290.5		

Generic Axis Engineering GUI

Close Loop	Abort	Home
Held		
Move To		mm
Move To		mm
Sample Period	5	* 442 usec

Encoder Scale	38996.00	counts/mm
Limit of Pos. Travel	42.596	mm
Limit of Neg. Travel	-58.183	mm
Encoder Home At	-19.549	mm
WFS F Offset	19.500	mm
Sci F Offset	23.500	mm

Proportional Gain	50000
Derivative Gain	600
Velocity Feed Forward	600
Integral Gain	30000
Integral Mode	1
Integration Limit	20000 1/16 count
Big Step Limit	8000 1/16 count
Feed Rate	25.000 mm/sec
Time of Acceleration	200 msec
Time of S-Curve	50 msec
Home Speed	10.000 mm/sec
Home Offset	0.000 mm
Maximum Velocity	50.000 counts/msec
Maximum Acceleration	0.250 counts/msec ²
Position Tolerance	0.005 mm
Following Error	32000 1/16 count
Hold Decel Rate	6576 2 ⁻²³ msec/servo
Error Deceleration Rate	5 counts/msec ²

Guide Camera Controller

- Uses custom PCI interface card
- Plan to use existing Magellan software
- Will write additional interface to MMT guider/WFS software

Auxilliary Software

- Cryostat temperatures and heaters
- Vacuum interlock system
- Motor temperatures, currents and voltages
- AC power control

Software block diagram

