

ODI Instrument Support Package Software

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ISP Functions

- Filter Arm Motion
- ADC Prism Motion
- Shutter Motion
- Filter Identification
- Temperature Sensing
- Temperature Control
- Pressure Sensing



ISP Software:

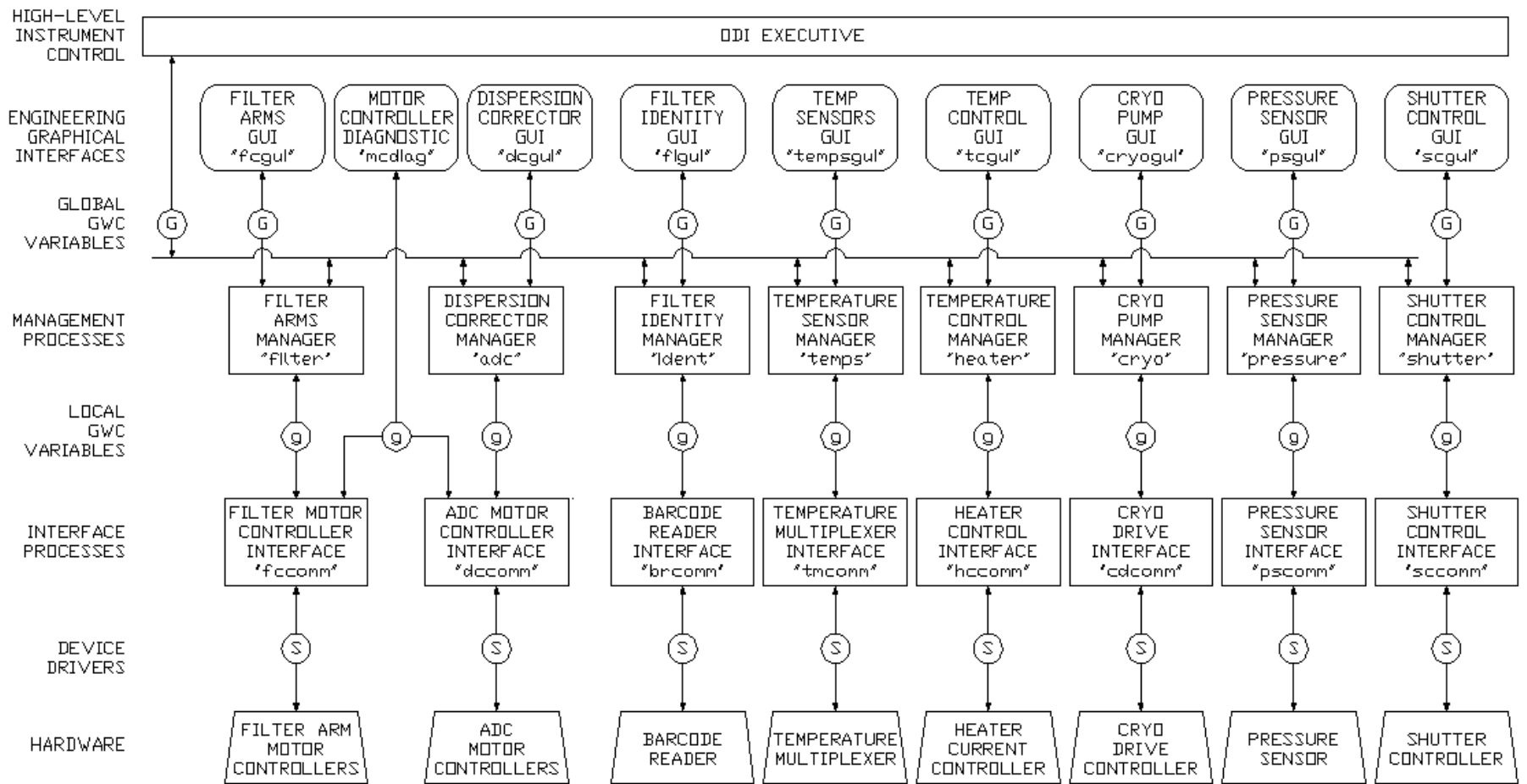
- Is written in tcl/Tk
- Provides graphical diagnostic and maintenance tools which are accessible via internet, or by using the local touch-screen pedestal
- Has proven structure based on QuOTA and NEWFIRM ISPs
- Runs on an EBX form factor Linux machine, located on telescope fork
- Connects to hardware devices on ODI via serial ports



GWC Router

- WIYN infrastructure for inter-process communication of variables and commands
- Provides command/status interface between high-level instrument control processes and the ISP
- Also used for communication among ISP processes
- ISP computer hosts a copy of the router for stand-alone operation





(G) GLOBAL COMMANDS AND VARIABLE VALUES VIA GWC ROUTER

(g) LOCAL COMMANDS AND VARIABLE VALUES VIA GWC ROUTER

(S) SERIAL INTERFACE VIA LINUX MULTIPORT DEVICE DRIVER

Filter Selection



- ODI will have 9 filter arms with in-out controls
- Bar code scanner identifies filters



Diagnostic Tools

HEMI Filter Arm Controller 1A

targetCount	12345	<input type="text" value="12345"/>	status:	ioPort:
positionCount	0	<input type="text" value="0"/>	ON POS	INTERLOCK OK
mode	target	<input type="button" value="set mode >"/>	ON VEL	LOOP OK
curVel	0		ACCEL	AUTO
maxVel	1000	<input type="text"/>	DECEL	MAN_OUT
minVel	400	<input type="text"/>	IN_MOTION	MAN_IN
accel	1000	<input type="text"/>	DISABLED	STOW
xiMode	0000	<input type="text"/>	DIR IN	IN
xiTrig	0000	<input type="text"/>	INDEX	OVER
ioPort	9c	<input type="text"/>		Arm Position:
				Reached Stow

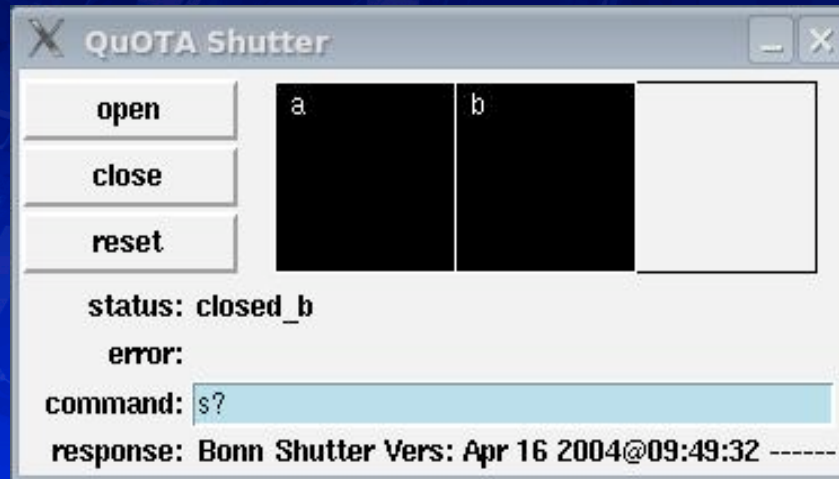
ARMDIAG

1A 1B 1C 2A 2B 2C 3A 3B 3C

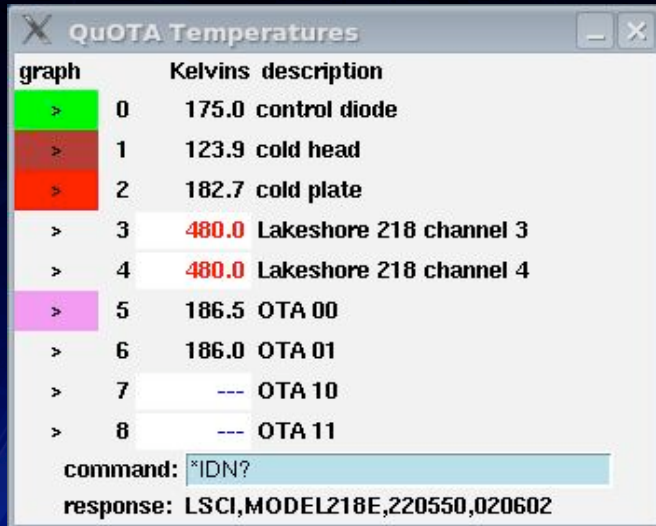


Shutter Control

- Shutter interface for manual operation and testing



Temperature Sensing



QuOTA has 9 temperature sensors, whereas ODI can have up to 96 sensors located throughout the instrument.



Temperature Control

- Software loop controls heater current to regulate detector temperature, using selected sensor inputs

temperature	+175.1	
set point	+175.0	<input type="text"/>
unit	Kelvin	select >
autotune mode	Manual	select >
gain (proportional)	999	<input type="text"/>
reset (integral)	009	<input type="text"/>
rate (derivative)	100	<input type="text"/>
heater range	low	select >
heater output (%)	100	<div style="width: 100%; height: 10px; background-color: red;"></div>

command:

response: LSCI,MODEL321,0,092904

Pressure Sensing

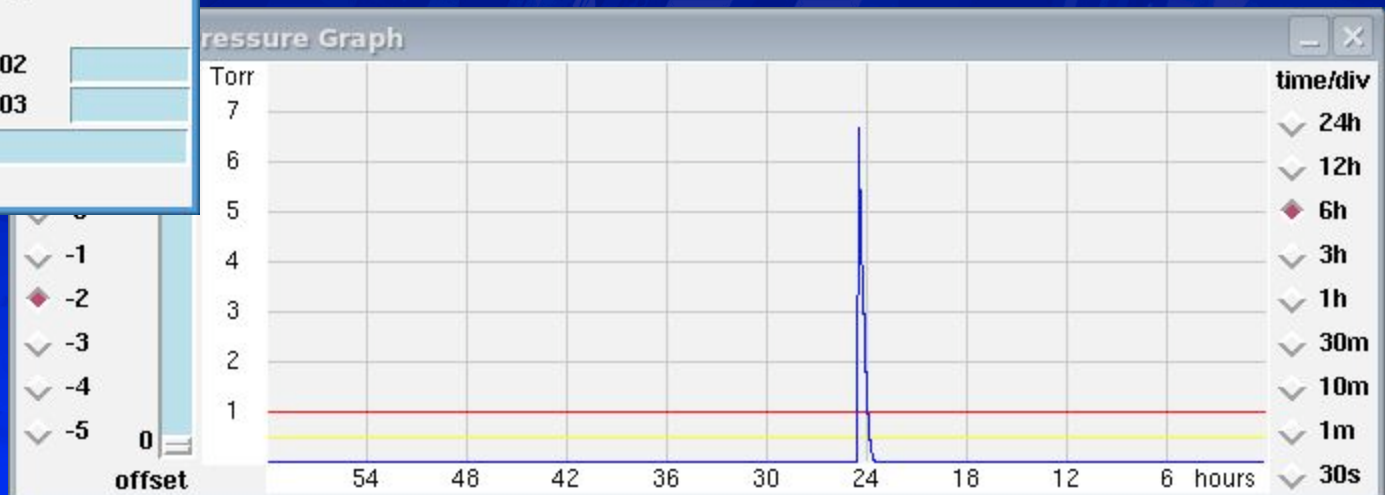
- G-P 356 modular gauge
- 1×10^{-9} Torr to atmosphere
- Interlock protects cryo cooler from high pressure



QuOTA Pressure Sensor

pressure (Torr)	0.00e+00
(mbar)	0
setpoint 2	1.00e-02
setpoint 1	5.00e-03

command: VER
response: 13627-05



Safety

- Safety does not depend on correct functioning of software
- Safety features are incorporated in the hardware design
- Example: bi-metal thermal switches protect against Dewar overheating
- Example: electronic interlocks, torque-limiting clutches and "pinch" switches protect against filter collision and injury to personnel by filter arms