

Optimising the EPICS End User Experience (focus on CS-Studio)

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IBEX

- IBEX is our EPICS based control system
- We use Eclipse / RCP for the main IBEX GUI
 - using components from CS Studio
- Python for scripting
- Run everything on MS Windows:
 - For compatibility with existing business systems
 - Allows install alongside old SECI system
 - However IBEX can run on Linux too



Different End Users

- Visiting scientist:
 - Quickly and easily perform an experiment
 - Only see relevant information
- Instrument / beamline scientist:
 - Configure the instrument
 - Diagnose problems
- Sample environment technician:
 - Configure equipment
 - Monitor equipment across several beamlines



GUI Use Cases

- Web / mobile summary view (read-only)
 - Quick check, all look OK / finished
- Monitor (+ control) an experiment:
 - Read/set values, feedback on running scripts
- Reconfigure an experiment:
 - Start & stop IOCs (add equipment)
 - Change IOC macro values used during startup
 - Create an experiment script sequence
 - Create / edit a new (synoptic) view
 - Change logging parameters



Using CS-Studio

- Originally used pre-built CS-Studio (3.x)
- Built a GUI and synoptic view using BOY
- However couldn't quite get the right “look and feel” for our users
 - See next slides



Previous SECI system

Sample Environment Control Interface

File Manager

MARI is RUNNING Run 15169

Time: 14:57 21 August 2009

User(s): Azuah/Glyde/Taylor

Title: He4 24 bar T = 2K 750 12A jaws 5x5 nim=50

Current Run Time: 23:16:54 Monitor Counts: 0

Good/Raw Frames: 0 / 0 Shutter Status: Open

Current/Total μ A: 0 / 0 Current Period: 1 of 1

BeamLine

Moderator_Temp: 111.6 K

Fermi_Speed: 0 Hz

Fermi_delay: 0 μ Sec

Tank_Vacuum: 9.90e-007 mbar

Sample Environment

Furnace_Control: 0 C

Furnace_Temp2: 0 C

power2: 0 %

Experiment Details

LabVIEW VIs

Open GENIE (Scripting)

DAE

System Messages

ISIS News

Report a Problem

Help

Beam Logger Fermi Chopper Trans Mon Eurotherm Disc Chopper Tank Vacuum Journal File

MARI Fermi Chopper - Front Panel.vi

MARI Fermi Chopper Control Panel

Last Command Received: Switch Drive Off

Chopper Status

MicroController OK

Nominal Speed Achieved

Magnetic Bearings

Upper Autozero Voltage 1: -0.03

Upper Autozero Voltage 2: -0.03

Lower Autozero Voltage 1: -1.06

Lower Autozero Voltage 2: -0.08

Messages

Logging In Progress

2009/08/02-18:52:45 Bearings Off and Speed >10Hz: Drive Switched Off

2009/08/02-20:52:45 Bearings Off and Speed >10Hz: Drive Switched Off

2009/08/03-08:52:43 Bearings Off and Speed >10Hz: Drive Switched Off

2009/08/03-11:48:27 Bearing Voltage Out of Range: Drive Switched Off

2009/08/03-12:08:12 Bearing Voltage Out of Range: Drive Switched Off

2009/08/03-20:52:41 Bearings Off and Speed >10Hz: Drive Switched Off

2009/08/04-02:36:37 Bearings Off and Speed >10Hz: Drive Switched Off

2009/08/04-03:00:39 Bearing Voltage Out of Range: Drive Switched Off

2009/08/04-18:52:38 Bearings Off and Speed >10Hz: Drive Switched Off

MARI Fermi Chopper - User Panel.vi

MARI Fermi Chopper Control Panel

Nominal Speed (Hz): 600 Actual Speed (Hz): 0

Nominal Delay (μ s): 847.004 Actual Delay (μ s): 0.000 Actual Gate Width (μ s): 5.000

Chopper Status

Spinning Down Freely

Speed Status

Stopped

STOP GO

Speed: 600 Delay: 847.000 Gate Width: 5.000

STOP VI

Configuration: mari_furnace.conf

Attempt 1: BOY based GUI

master.opi

Beam
Off
Shutter
CLOSED
Run State
SETUP

Inst: NDW1407
Run: 00000071
Time: 2014/04/15 11:34:59
User(s): ICP
Title:
(DAE SIMULATION MODE) Test
Good/raw frames: 0 / 0
Current/total: 0.000 / 0.000
Current period: 1 of 1

Update selected group
Load... Save
Group Name Overview

Overview (server)
Beam Current 0.000
Run number 00000071
Status SETUP
Sample
Phase Disconnected

Slit 1 (server)
H Gap 1 5.000
V Gap 1 1.000
North 1 1.500
South 1 0.500
East 1 8.500
West 1 3.500

Slit 2 (server)
H Gap 2 0.000
V Gap 2 0.000
North 2 0.000
South 2 -0.000
East 2 0.000
West 2 -0.000

Slit 3 (server)
H Gap 3 0.000
V Gap 3 0.000
North 3 0.000
South 3 -0.000
East 3 0.000
West 3 -0.000

Slit 4 (server)
H Gap 4 0.000
V Gap 4 0.000
North 4 0.000
South 4 -0.000
East 4 0.000
West 4 -0.000

Home
All Pages... Pages... Beamline Pages...

All Motion
Motors are stationary STOP

ISIS Status MCR News Beam Status Graph Bug Reporting

Larmor
Neutrons

pressure A1
Disconnected
Vacuum 1

Chopper
Freq Disconnected
Phase Disconnected
Error Disconnected

Monitor 1
Counts 0 counts

Slit 1
HGap 5.000
VGap 1.000

Monitor 2
Counts 0 counts

Polywall

pressure A1
Disconnected
Vacuum 2

Slit 2
HGap 0.000
VGap 0.000

Slit 3
HGap 0.000
VGap 0.000

Monitor 3
Counts 0 counts

Sample Stack
Sample Posn
Phi/Theta 0.0000 mm
Psi 0.0000 mm
Rotation 0.0000 mm

Slit 4
HGap 0.000
VGap 0.000

Monitor 4
Counts 0 counts

Moving Bench

DAE

ISIS

☐ Synchrotron
☐ TS1
☒ TS2

Target Station 1
Beam to TS2

TS2 PPS 0.000

TS2 Beam Current 0.000

TS2 uAh Since Midnight 0.000

Decoupled Methane Temp -252.000

Coupled Methane Temp 300.000

Coupled Hydrogen Temp 272.200

DMOD Runtime 14.000

DMOD Runtime Limit 915.000

DMOD Anneal Pressure 0.000

DMOD uAh Beam 0.000

TS2 Last Beam On Disconnected

TS2 Last Beam Off 2014-04-04T11:57:24

Attempt 2: Eclipse/ RCP Based GUI

IBEX
Instrument Configuration Synoptic IOC Console Help

LARMOR is SETUP

Run: 00003490 Shutter: CLOSED

Title: Analyser setup y=-7.0 arc=-6.5 a2=2.0

Users:

Good / Raw Frames: 0 / 0 Inst. Time: 11/06/2015 11:15:56
Current / Total: 0 / 0 Run Time: 5 min 27 s
Monitor Counts: 0 Period: 1 / 1

Configuration: larmor_base

JAW GAPS		BENCH		Sample		Detector		Optics		Other	
CJHGap	30.001	BSZ	337.99925	Phi	0.28816 deg	DetectorPack1	Off	Pol_Trans	209.00000 mm	Eurotherm1_...	disconnected
A1HGap	20.001	BSY	88.01325	CoarseHeight	16.64300	DetectorPack4	Off	BlockhouseV...	130.000	Eurotherm1_...	disconnected
S2VGap	39.986	BenchStatus	LOWERED	Translation	-14.99400 mm	DetectorPack2	Off	An_Trans	-7.00050 mm	J1TempB	disconnected
S2HGap	38.084	BenchLift	LOWER	J1SetTemp	0.0 C	DetectorPack3	Off	An_Arc	-1.88810 mm	Eurotherm1_...	disconnected
S1HGap	13.993	Bench_Rot	-0.002	SampleX	2.03800 mm			Pol_Arc	-1.59910 mm	S1VCent	0.000
A1VGap	19.998	M4Trans	200.00404	SamplePos						IncidentVacu...	0.002
S1VGap	14.000	Mon4InOut		J1Temp	23.0 C					s2south	-18.288
CJVGap	30.006			J2Temp	22.0 C					KEPCO1_Cu...	disconnected
				J2SetTemp	0.0 C						
				FineHeight	-0.00100 mm						

Current user: NONE Bump strip is NOT_TRIPPED Motors are STATIONARY Stop All

Alarms
Beam Status
DAE
Data Browser
Experiment Details
IOC Log
Motors
Scripting
Synoptic
Web Links

Prev Up Next Go to: Current Synoptic: Larmor Switch Synoptic

Pressure A2 0.011 Pressure B1 130.000

Vacuum 1 Vacuum 2

Coarse Jaws
HGap 30.001
VGap 30.006

Chopper
Frequency 20
Phase 0
Error 0

Polariser
In/Out FOM
Angle -0.084 degree

Aperture 1
HGap 20.001
VGap 19.998

Slit 1
HGap 13.993
VGap 14.000

Monitor 3
Counts 0 counts
M3Height 0.00003

Sample Changer
Sample B_J
In Position 1

Sample Stack
X 2.038
Y -14.994
PHI 0.288
Fine Height -0.001

Slit 2
HGap 38.084
VGap 39.986

Monitor 4
Counts 0 counts
M4Trans 200.00404

Bench Rotation
Target angle Unknown
Current angle Unknown
Status Unknown

Analysers
In/Out Angle -0.300 degree

Moving Beamstop
Counts 0 counts
Z 337.99925
Y 88.01325

IBEX Client: Table of Motors View

The screenshot displays the IBEX Client's 'Table of Motors View'. A modal window is open for the motor 'B - Stack - Y', showing its configuration and control options. The background shows a grid of motor status cards, each with a name, position, and speed.

Motor Details (B - Stack - Y):

- Name:** B - Stack - Y
- High Limit:** 5000.00000
- Current Posn:** -191.79600
- Low Limit:** -5000.00000
- Target Posn:** -191.80000
- At Home** (checkbox)

Controls:

- Tweek:** < 1.00000 >
- Home:** < >
- Jog:** < >
- STOP** (Red button)
- Stop**, **Pause**, **Move**, **Go** (Buttons)
- More Details...** (Button)

Motor Status Grid (Background):

Motor ID	Motor Name	Position (Val)	Speed (SP)
1	S1 North STATIONARY	15.00	15.00
2	S3 North STATIONARY	0.00	0.00
3	STATIONARY	0.00	0.00
4	Bench STATIONARY	-0.00	-0.00
5	A - Stack MOVING	-	-
6	A - Motor STATIONARY	0.00	0.00
7	STATIONARY	0.00	0.00
8	S2 East STATIONARY	10.00	10.00
9	S4 East STATIONARY	16.35	16.35
10	STATIONARY	0.00	0.00
11	STATIONARY	-0.00	-0.00
12	STATIONARY	0.00	0.00
13	Beamstop Y STATIONARY	88.01	88.01
14	STATIONARY	0.00	0.00
15	STATIONARY	0.00	0.00

The IBEX GUI

- Eclipse / RCP application using components from CS-Studio:
 - Such as PV Manager, data browser, ...
 - But have more control over layout
- Also use other components:
 - PyDev scripting console
 - Graphing from Diamond DAWN project
- Can use CS-Studio BOY OPI files too:
 - These are used for synoptic “drill down”



The IBEX GUI (cont.)

- Using both BOY and native eclipse / RCP gives us necessary flexibility:
 - However eclipse / RCP is a steep learning curve
 - Much more work than just using BOY
 - But needed to handle complex configuration management

Other CS-Studio Applications Used

- Two CS-Studio archive engines per beamline
 - for beamline data and for experiment data
- CS-Studio based IOC Log server / ActiveMQ to manage and display IOC log messages
- AlarmServer (BEAST)



Plankton

- A python framework for creating device emulators:
 - Supports stateful devices
 - Supports “back door” to control device behaviour
- Being developed as part of ISIS / ESS in-kind
- We plan to use it for most of our devices
- See <https://github.com/DMSC-Instrument-Data/plankton/>



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- Many people have contributed to IBEX:
 - Freddie Akeroyd, Kathryn Baker, Matt Clarke, Simon Fernandez, Lottie Greenwood, Jack Harper, Michael Hart, Gareth Howells, David Keymer, Thomas Lohnert, Chris Moreton-Smith, Dominic Oram (STFC), Martin Bell, Ian Bush, John Holt, Robert Nelson, Adrian Potter, Isabella Rey, Kris Ward, Kevin Woods (Tessella)
- Code hosted at:
<https://github.com/ISISComputingGroup>

Part 2: Python Script server

- Something many scientists have asked for
 - Had script writers / generators before
- Hand you over to Dominic Oram



Development of a Script Server at ISIS

Dominic Oram



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Motivation

- Users run python scripts for longer experiments
- Client side scripting is bad:
 - What happens if the network dies mid script?
 - How do we know who is running the script?
- We need to pause/kill scripts if there is an fault
- Queuing multiple scripts would be useful
- Scientists wish to change a value without having to restart their whole script
- We want to be able to do dry runs of scripts

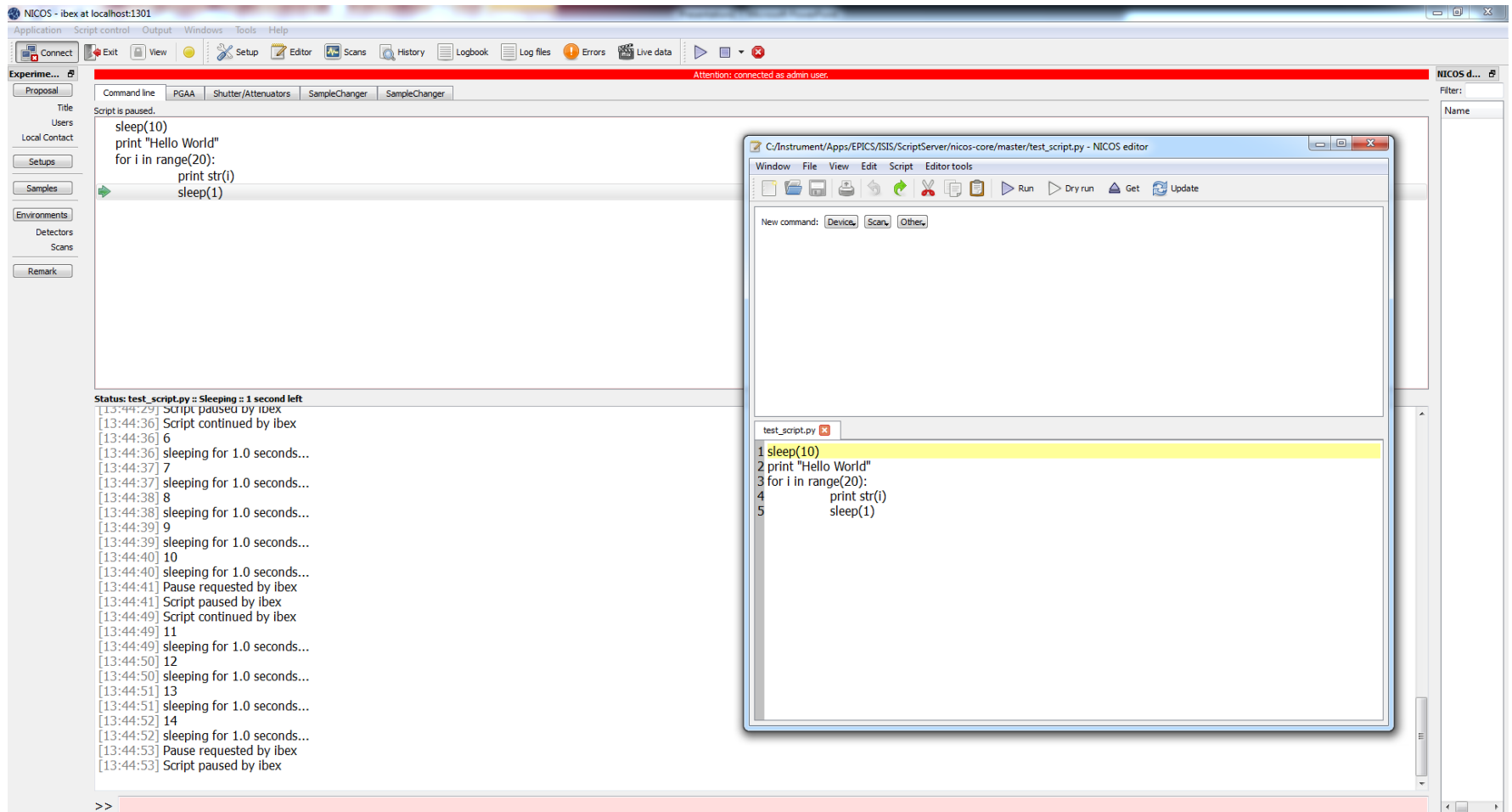


Prospective Options

Option	Scan Server	NICOS
Used/written by	SNS	FRM II
Written in	Java	Python
GUI	CSS integrated	PyQt based GUI
Client-Server comms	XML	Pickled python objects
Available Commands	Hardcoded (originally)	Added through inheritance
Intended Scope	Used as part of a wider EPICS distribution	Used as a whole control system



NICOS



ISIS NICOS Proxy

- Can't integrate a pyQt interface into IBEX
- Wanted to separate GUI and script server implementation
- Java has no good pickled python libraries
- We have written a proxy that allows communication with NICOS via JSON and ActiveMQ
- See <https://github.com/ISISComputingGroup/nicos-core>



Future Work

- Integrate script server communication into IBEX
- Investigate options for using client-side genie python with the script server
- Create a number of script generator views to aid scientists in creating scripts
- Investigate how to handle changing scripts whilst they are running





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IBEX System Components

IBEX Client (GUI)

IBEX Client (Python Script)

IBEX Client
(Web Dashboard)

EPICS External Gateway (access control)

Blocks Gateway
(aliases)

Blockserver
(configurations)

IOC

IOC

IOC

Run Control

Neutron Acquisition
Program (with EPICS
interface)

Instrument
Archiver

Alarm Server

Blocks
Archiver

Message
Logger

Sample Environment

NeXus Data Files

MySQL

ActiveMQ



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Why Choose CS-Studio?

- Chose EPICS, now needed GUI framework
- Only contenders really at the time were:
 - EPICS Qt
 - CS-Studio
- Chose CS-Studio as:
 - Mature collaboration
 - Used as Diamond and SNS, ORNL
 - Provides a lot of functionality



IBEX Client: Adding Blocks

The screenshot displays the IBEX Client interface, which is used for configuring and controlling the NDXLARMOR setup. The main window is titled "IBEX" and includes a menu bar with options: IBEX, Configuration, Synoptic, IOC, Run-Control, and Help.

NDXLARMOR is SETUP

Run: 00013072 Shutter: CLOSED

Title: Rep_B - Data1
Users: Larmor

Good / Raw Frames: 0 / 0 Inst. Time: 15/10/2016 22:10:06
Current / Total: 0 / 0 Run Time: 29 hours 15 s
Monitor Counts: 0 Period: 1 / 1

JAW GAPS

AIHGap:	30.001
SIHGap:	35.000
CJHGap:	35.002
CJHGap:	34.998
S2HGap:	37.882
SIHGap:	35.000
AIHGap:	30.000
S2HGap:	40.300

BENCH

M4Trans:	200.10004
B52:	0.00025
BenchLift:	LOWER
BenchStatus:	LOWERED
Bench_Rot:	-0.071
MonInOut:	
BSY:	0.00000

Sample

FineHeight:	-0.02600 mm
SamplePos:	CT
Translation:	-15.00300 mm
Phi:	0.00045 deg
SampleX:	0.00900 mm
CoarseHeight:	28.99900
XLoLim:	-40.00000 mm
XHiLim:	40.00000 mm

Detector

DetectorPack2:	Off
DetectorPack3:	Off
DetectorPack1:	Off
DetectorPack4:	Off

Optics

BlockhouseVacuum:	0.530
Pol_Arc:	-1.59920 mm
Pol_Trans:	0.00005 mm
An_Zarc:	0.00000 mm
An_InOut:	
An_Trans:	0.00000 mm
An_Deg:	0.000 degree

Choppers

TOPhase:	
InstrumentDiskPhase:	
IncidentVacuum:	

Alarms (53)

Beam Status

DAE

Experiment Details

IOC Log

Log Plotter

Motors

Scripting

Synoptic

Web Links

PV Selector

PVs From: Active IOCs

Interest Level: High

PV address: Clear

PV address	Description
IN:LARMOR:BENCH.FLOW1	FLOW1 Flow
IN:LARMOR:BENCH.FLOW2	FLOW2 Flow
IN:LARMOR:BENCH.FLOW3	FLOW3 Flow
IN:LARMOR:BENCH.FLOW4	FLOW4 Flow
IN:LARMOR:BENCH.MOVE.SP	Request move
IN:LARMOR:BENCH.MOVE.SP.RBV	Request move readback
IN:LARMOR:BENCH.STATUS	Status
IN:LARMOR:BENCH.VALVE1	VALVE1 Opening
IN:LARMOR:BENCH.VALVE2	VALVE2 Opening
IN:LARMOR:BENCH.VALVE3	VALVE3 Opening
IN:LARMOR:BENCH.VALVE4	VALVE4 Opening
IN:LARMOR:CAEN:hv0.0.0.i0set	Primary current limit
IN:LARMOR:CAEN:hv0.0.0.i1set	Primary current limit
IN:LARMOR:CAEN:hv0.0.0.i1set	Secondary current limit

Block Configuration

Configure Block

PV Address invalid, must not be empty

Selected block:

Name: YStack ☒ Visible ☒ Local

PV address: Select PV

Run-Control Settings

Low Limit: 0.0 High Limit: 0.0 ☐ Enabled

Logging Settings

Mode: Periodic Scan for Change Rate/seconds: 0 ☐ Enabled

Editing the current configuration

Name	PV address	Visible?
Psi	IN:LARMOR:MOT:STACK:PSI	<input checked="" type="checkbox"/> Yes
SampleChi	IN:LARMOR:MOT:STACK:CHI:SP	<input checked="" type="checkbox"/> Yes
XLoLim	IN:LARMOR:MOT:STACK:X:MTR.LLM	<input checked="" type="checkbox"/> Yes
XHiLim	IN:LARMOR:MOT:STACK:X:MTR.HLM	<input checked="" type="checkbox"/> Yes
InstrumentDiskPhase	IN:LARMOR:MK3CHOPPER_01:CH3-PHAS	<input checked="" type="checkbox"/> Yes
TargetDiskPhase	IN:LARMOR:MK3CHOPPER_01:CH2-PHAS	<input checked="" type="checkbox"/> Yes
TOPhase	IN:LARMOR:MK3CHOPPER_01:CH1-PHAS	<input checked="" type="checkbox"/> Yes
PI_Rotation	IN:LARMOR:SDTEST_01:P2:GETVAL	<input checked="" type="checkbox"/> Yes
PI_Rotation	IN:LARMOR:SDTEST_01:P2:SETVAL	<input checked="" type="checkbox"/> Yes
DR:JULABO_01:EXTTEMP	DR:JULABO_01:EXTTEMP	<input checked="" type="checkbox"/> Yes
DR:MOT:MTR0605	DR:MOT:MTR0605	<input checked="" type="checkbox"/> Yes
DR:LKUP:ANALYSER:POSIN:SP	DR:LKUP:ANALYSER:POSIN:SP	<input checked="" type="checkbox"/> Yes
DR:EUROTHERM1:A03:RBV	DR:EUROTHERM1:A03:RBV	<input checked="" type="checkbox"/> Yes
DR:EUROTHERM1:A02:RBV	DR:EUROTHERM1:A02:RBV	<input checked="" type="checkbox"/> Yes
DR:EUROTHERM1:A01:RBV	DR:EUROTHERM1:A01:RBV	<input checked="" type="checkbox"/> Yes
DR:MOT:BENCH:ROT	DR:MOT:BENCH:ROT	<input checked="" type="checkbox"/> Yes
DR:MOT:MTR0607:RBV	DR:MOT:MTR0607:RBV	<input checked="" type="checkbox"/> Yes
DR:MOT:MTR0608:RBV	DR:MOT:MTR0608:RBV	<input checked="" type="checkbox"/> Yes
DR:MOT:JAWS2:VGAP	DR:MOT:JAWS2:VGAP	<input checked="" type="checkbox"/> Yes
DR:MOT:JAWS2:HGAP	DR:MOT:JAWS2:HGAP	<input checked="" type="checkbox"/> Yes
DR:MOT:JAWS3:VGAP	DR:MOT:JAWS3:VGAP	<input checked="" type="checkbox"/> Yes
DR:MOT:JAWS3:HGAP	DR:MOT:JAWS3:HGAP	<input checked="" type="checkbox"/> Yes
DR:MOT:JAWS4:VGAP	DR:MOT:JAWS4:VGAP	<input checked="" type="checkbox"/> Yes
DR:MOT:JAWS4:HGAP	DR:MOT:JAWS4:HGAP	<input checked="" type="checkbox"/> Yes
IN:LARMOR:MOT:MTR0502:RBV	IN:LARMOR:MOT:MTR0502:RBV	<input checked="" type="checkbox"/> Yes
IN:LARMOR:MOT:MTR0507:RBV	IN:LARMOR:MOT:MTR0507:RBV	<input checked="" type="checkbox"/> Yes

Add Block Edit Block Delete Block

Save Save as ... Cancel

Current configuration: larmor_base

Connection to log message routing server (JMS) functioning normally.

IBEX Client: Synoptic Editor

Edit Synoptic

Instrument Tree

- Vacuum 1
 - Chopper
 - Coarse Jaws
- Vacuum 2
 - Polariser
 - Aperture 1
 - Slit 1
 - Monitor 3**
- Sample Stack Env
 - Sample Changer
 - Sample Stack
- Moving Bench
 - Slit 2
 - Monitor 4
 - Bench Rotation
 - Analyser
- Moving Beamstop

Add Component Copy Component
Delete Component ☒ Show Beam

Component Details

Name:

Type:

Icon:

PVs:

Add New PV Remove PV

Component Target Details

Name:

Default Target Clear Target

Description:

Properties

Name	Value	
M	3	
CHANNUM	2	
MM	MOT:MTR0601	

Value:

Description:

PV Details

Select a PV to view/edit details

Synoptic Preview Save Save as ... Cancel

IBEX

ConfigurationSynopticIOCRun-ControlHelp

NDW1298 is SETUP

Run: 00000001Shutter: UNKNOWN

Title: (DAE SIMULATION MODE) long title

Users:

Good / Raw Frames: 0 / 0

Current / Total: 0 / 0

Monitor Counts: 0

Inst. Time: 08/09/2016 11:48:21

Run Time: 0 s

Period: 1 / 1

Current user: NONEMotors are STATIONARYStop All

Alarms (8)

Beam Status

DAE

Device Screens

Experiment Details

IOC Log (18)

Log Plotter

Motors

Scripting

Synoptic

Web Links

Synoptic Selection

Ticket1499_DEMO_OPIsRefresh Synoptic

Synoptic Navigation

LAKESHORE

LAKESHORE

Current StyleProposed Style

Current StyleProposed Style

Lakeshore 336 Temperature Controller

Current Style

Output 1Output 2Graph All TMeasurementsGraph Measurements

OUTPUT 1

SETPOINT: 100.000 K100.000 K

TEMP IN WINDOW:

RAMP:

RAMP RATE: 2.000 K/min2.000 K/min

Output 1 Settings...

P: 1.01.0

I: 2.02.0

D: 3.03.0

OUTPUT MODE:

Closed Loop PID

HEATER OUTPUT: 50.0 %

HEATER STATUS: Short/ComplianceRESET

CONTROL INPUT: Measurement A

TEMP: 2.600

NAME: Default Name

ALARM:

Measurement A Settings...

Current configuration: Ticket1499_DEMO_OPIs

IBEX

IBEX Configuration Synoptic IOC Run-Control Help

NDW1298 is SETUP

Run: 00000001 Shutter: UNKNOWN

Title: (DAE SIMULATION MODE) long title

Users:

Good / Raw Frames: 0 / 0

Current / Total: 0 / 0

Monitor Counts: 0

Inst. Time: 08/09/2016 11:49:34

Run Time: 0 s

Period: 1 / 1

Current user: NONE

Motors are STATIONARY

Stop All

Alarms (8)

Beam Status

DAE

Device Screens

Experiment Details

IOC Log (19)

Log Plotter

Motors

Scripting

Synoptic

Web Links

Synoptic Selection

Ticket1499_DEMO_OPIs Refresh Synoptic

Synoptic Navigation

Current Style Proposed Style

LAKESHORE

LAKESHORE

Current Style - Output1 Proposed Style

100%

Lakeshore 336 Temperature Controller

Proposed Style

Output 1 Output 2 Graph All T Measurements Graph Measurements

Operation

Setpoint: 100.000 K 300.000 K

Temp in window:

Ramp: On/Off

Ramp rate: 2.000 K/min 2.000 K/min

Control input: Measurement A

Measurement

Temperature: 9.900 K

Name: Default Name

Alarm:

Measurement A Settings...

Control Parameters

P: 1.0 3.0

I: 2.0 2.0

D: 3.0 3.0

Output mode: Closed Loop PID

Heater

Output: 60.0 %

Status: Short/Compliance Reset

Output 1 Settings...

Current configuration: Ticket1499_DEMO_OPIs