Badlfish: an EDD/DM to EDM translator

Outline

- Introduction
- EDD/DM file structure
- EDM file structure
- Widget translation
- Color map and color rule translation
- Example translations
- Further information for use
- Summary and future enhancements

Dayle Kotturi
dayle@slac.stanford.edu

Introduction

- EDD/DM format unreadable by EDM
- Need an automated tool (so many panels!)
- Use perl to make use of pattern matching

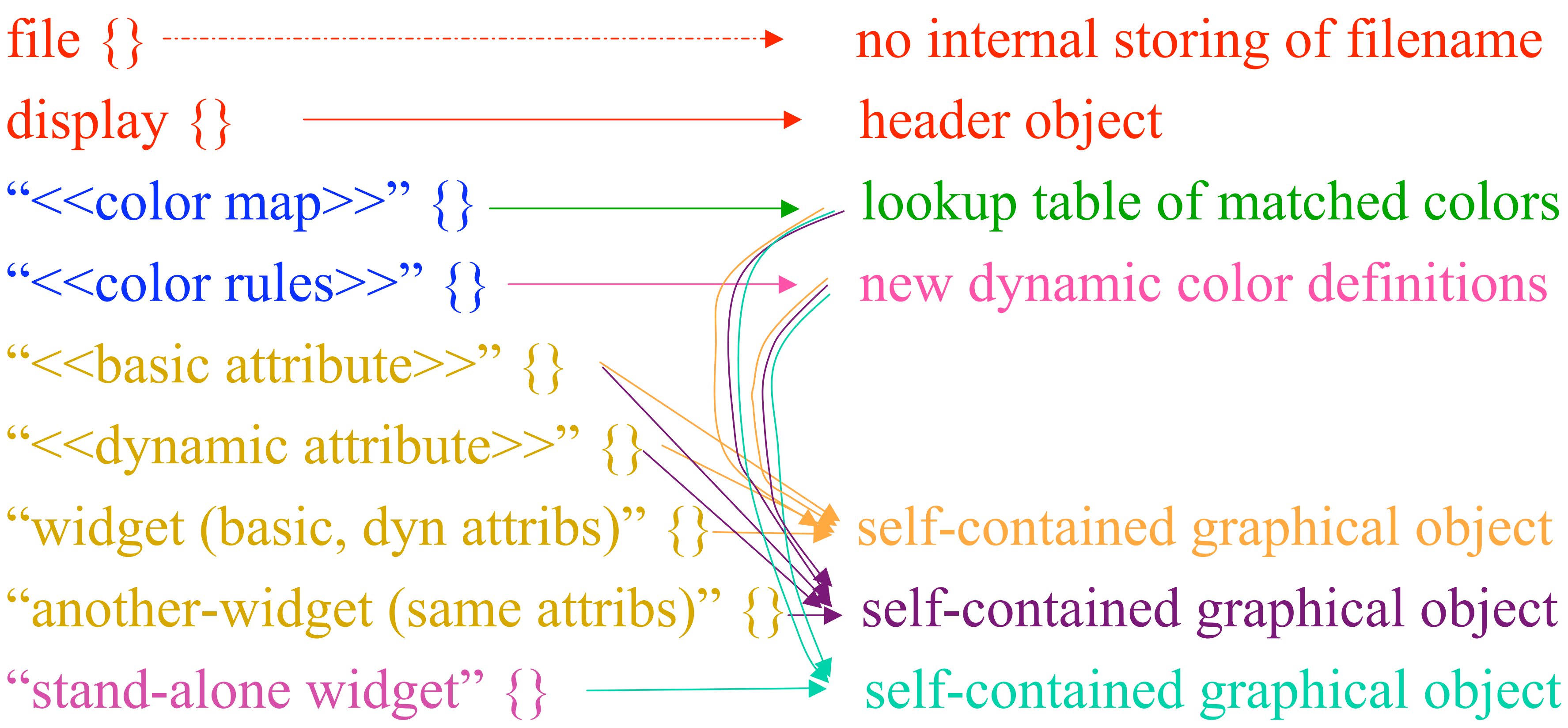
EDD/DM file structure

file {}	header
display {}	
“<<color map>>” {}	here or in an
“<<color rules>>” {}	external file
“<<basic attribute>>” {}	x,y,w,h,group
“<<dynamic attribute>>” {} (optional)	clrrule,vis
“widget that uses basic, dyn attributes” {}	image,line,
“another-widget-that-uses same attributes” {}	oval, rect, text
“stand-alone widget that doesn’t use attribs” {}	exec, rdisp,
	kill disp, text
	update

EDM file structure

header object	display size, colors, fonts
self-contained graphical object	all widgets

Widget translation



file {}

display {}

“<<color map>>” {}

“<<color rules>>” {}

“<<basic attribute>>” {}

“<<dynamic attribute>>” {}

“widget (basic, dyn attribs)” {}

“another-widget (same attribs)” {}

“stand-alone widget” {}

no internal storing of filename

header object

lookup table of matched colors

new dynamic color definitions

self-contained graphical object

self-contained graphical object

self-contained graphical object

Widget translation

	EDD/DM	EDM
Graphics	Rectangle	Rectangle
	Line	Line
	Oval	Circle
	Arc	Arc
	Text	Static Text
	3-D Border	N/A
	Image	GIF Image

Widget translation

	EDD/DM	EDM
Monitors	Indicator	Bar
	Bar	Bar
	Text Update	Text Monitor
	Meter	Meter
	Byte	Byte

Widget translation

	EDD/DM	EDM
Controllers	Valuator	?
	Text Entry	Text Entry
	Choice Button	Choice Button
	Message Button	Message Button
	Toggle Button	Button
	Menu	?
	File Selection Menu	?

Widget translation

	EDD/DM	EDM
Controllers (continued)	Related Display	Related Display
	Execute Script	Shell Command
	Kill Display	Exit Button
	Print Display	N/A
	Print Options	N/A
	Cartesian Plot	X-Y Plot

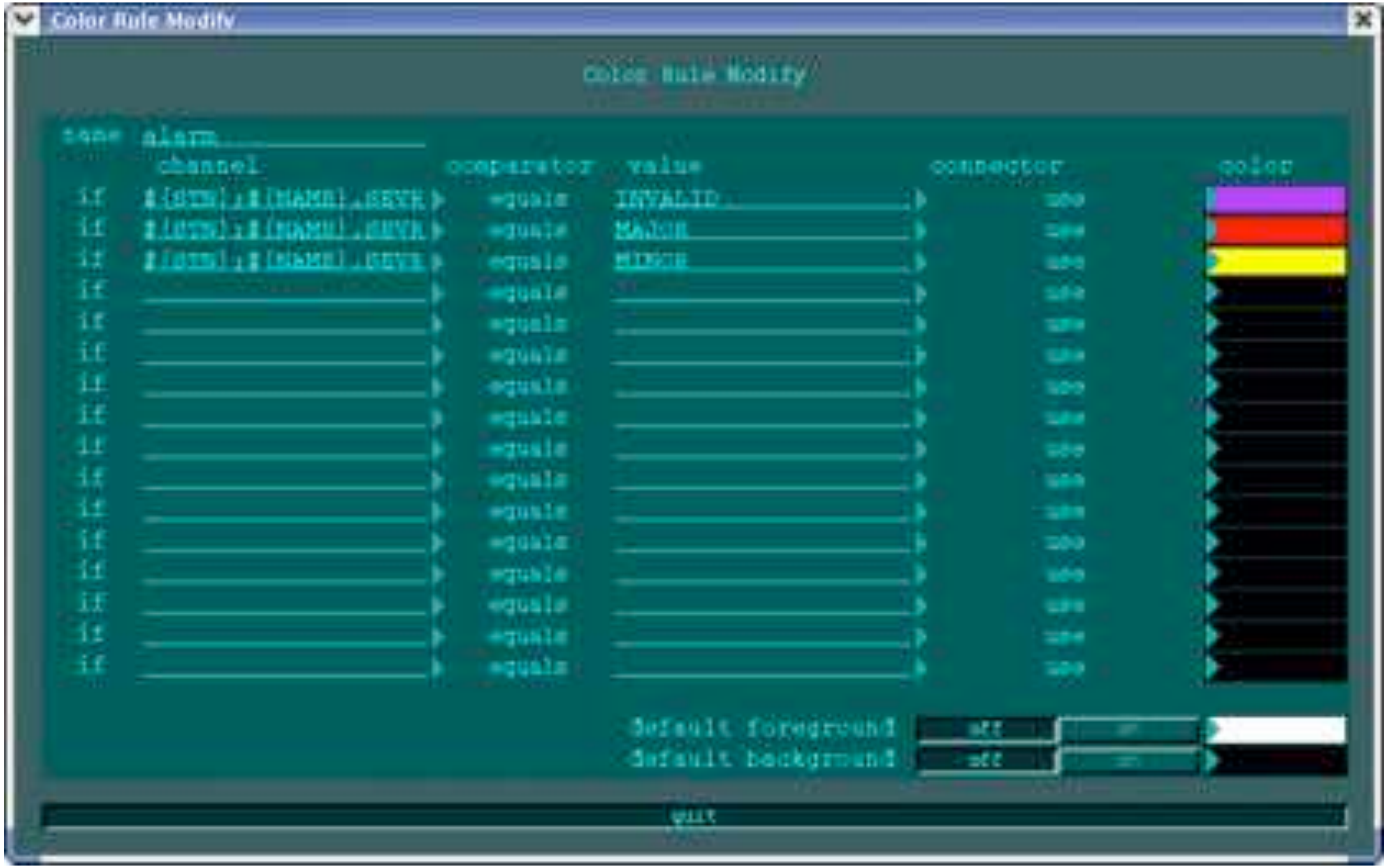
Color map translation

- 8-bit EDD/DM colors (RGB) → 16-bit colors (RGB)
- Blinking EDD/DM colors → (R,G,B,R/2,G/2,B/2)
- Add basic blinking color entries to EDM colors so they exist
- Least square fit to match 16-bit EDD/DM to EDM colors
- Save results in color lookup table to use in widget translation
- User has option to intervene and change LUT during process
- Except for add'l blinking colors, EDM colors unchanged

Color rule translation

- EDD/DM has two kinds: single PV and multi-PV rules
  - Single PV color rules become new “colors” in EDM colors which set a static color based on value of PV
  - Multi-PV color rules also become new “colors” but the input PVs have to be combined first into a CALC so that there is only one output (which becomes the input to the new “color”) and is then set, as done for the single PV, to a static color based on the value
- The new “colors” must be added to EDM color definition before EDM can be run on translated panel

Color rule translation example



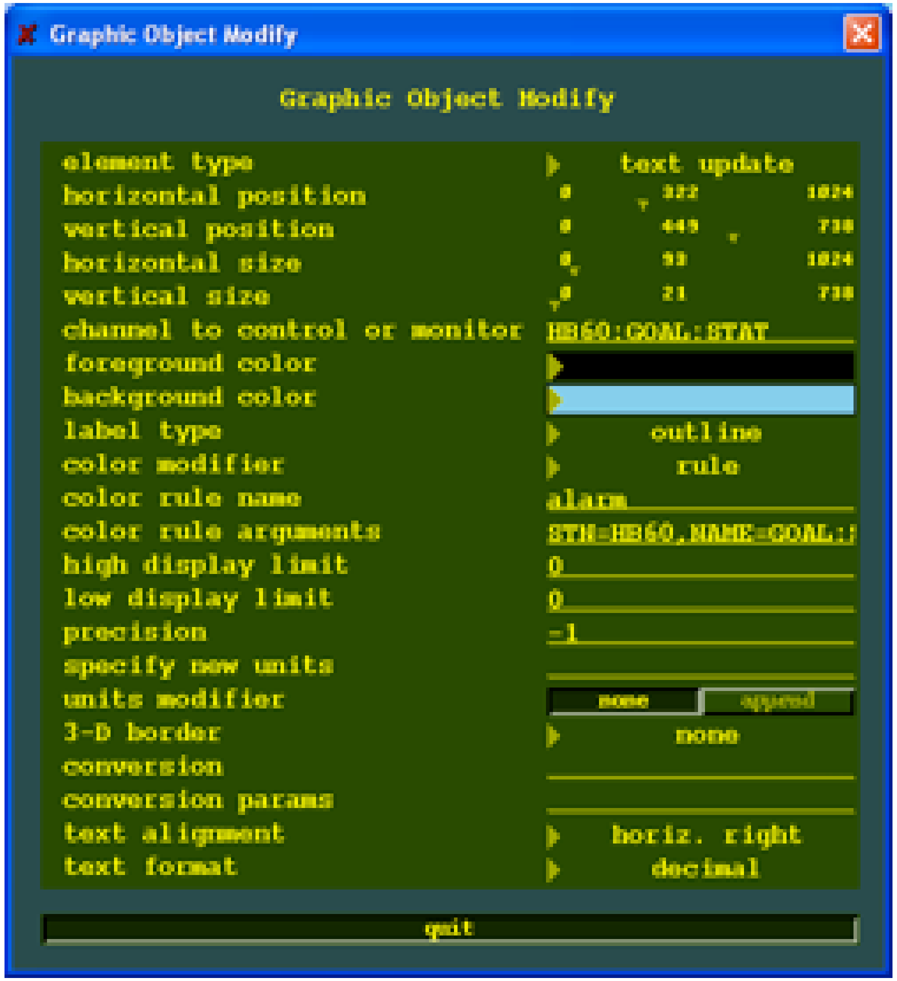
Color Rule Modify

type alarm

	channel	comparator	value	connector	color
if	${STN}:${NAME}.SEVR	equals	INVALID	use	🟪
if	${STN}:${NAME}.SEVR	equals	MAJOR	use	🟥
if	${STN}:${NAME}.SEVR	equals	MINOR	use	🟨
if		equals		use	⬛
if		equals		use	⬛
if		equals		use	⬛
if		equals		use	⬛
if		equals		use	⬛
if		equals		use	⬛
if		equals		use	⬛
if		equals		use	⬛
if		equals		use	⬛
if		equals		use	⬛
if		equals		use	⬛
if		equals		use	⬛
if		equals		use	⬛

default foreground	off	on	⬜
default background	off	on	⬛

Color rule translation example



Graphic Object Modify

element type	▸ text update
horizontal position	0 322 1024
vertical position	0 449 768
horizontal size	0 33 1024
vertical size	0 21 768
channel to control or monitor	HB60:GOAL:STAT
foreground color	▸ ⬛
background color	▸ 🟦
label type	▸ outline
color modifier	▸ rule
color rule name	alarm
color rule arguments	STN=HB60,NAME=GOAL:[
high display limit	0
low display limit	0
precision	-1
specify new units	
units modifier	none append
3-D border	▸ none
conversion	
conversion params	
text alignment	▸ horiz. right
text format	▸ decimal

Color rule translation example

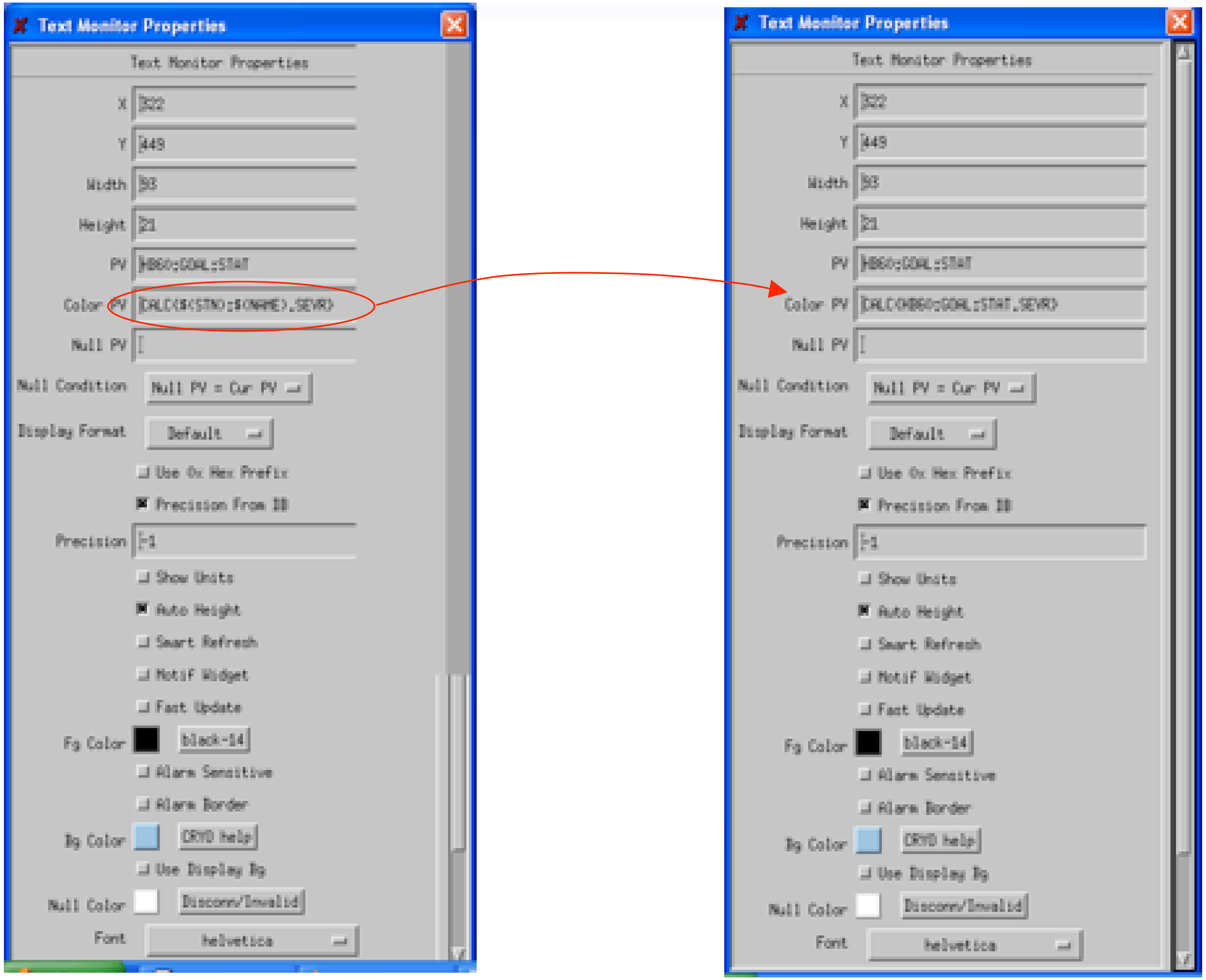
Contents of color rule look-up table for rule “alarm”:

rule	name	type	calc	clr
0	alarm	s	CALC\{$(STN):$(NAME).SEVR}	84

New color for EDM color definition file looks like this:

```
rule 84 alarm {
 = -1    : “purple-46”
 = 2     : “Monitor: MAJOR”
 = 1     : “Monitor: MINOR”
}
```

Note that “purple-46”, “Monitor*” are existing EDM static colors



Text Monitor Properties

Text Monitor Properties

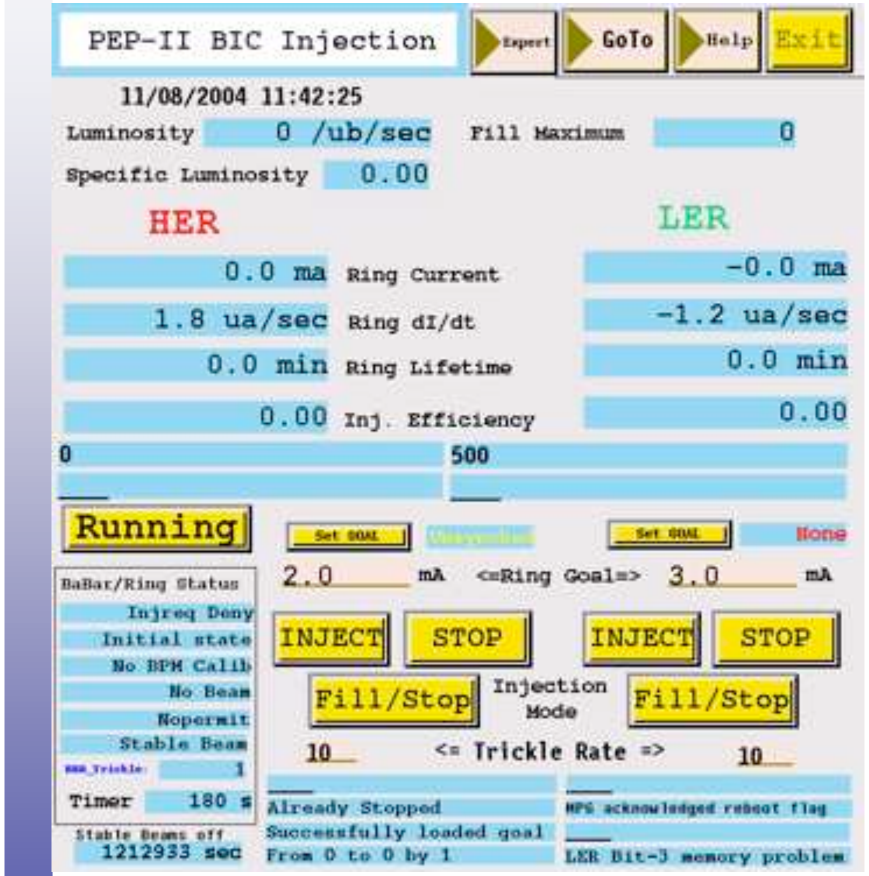
X 322
Y 449
Width 93
Height 21
PV HB60:DOAL:STAT
Color PV CALC{$(STN):$(NAME).SEVR}
Null PV
Null Condition: Null PV = Cur PV
Display Format: Default
□ Use 0x Hex Prefix
☒ Precision From DB
Precision -1
□ Show Units
☒ Auto Height
□ Smart Refresh
□ Motif Widget
□ Fast Update
Fg Color ■ black-14
□ Alarm Sensitive
□ Alarm Border
Bg Color CRYO help
□ Use Display Bg
Null Color Disconn/Invalid
Font: helvetica

Text Monitor Properties

Text Monitor Properties

X 322
Y 449
Width 93
Height 21
PV HB60:DOAL:STAT
Color PV CALC{HB60:DOAL:STAT.SEVR}
Null PV
Null Condition: Null PV = Cur PV
Display Format: Default
□ Use 0x Hex Prefix
☒ Precision From DB
Precision -1
□ Show Units
☒ Auto Height
□ Smart Refresh
□ Motif Widget
□ Fast Update
Fg Color ■ black-14
□ Alarm Sensitive
□ Alarm Border
Bg Color CRYO help
□ Use Display Bg
Null Color Disconn/Invalid
Font: helvetica

Example translations



PEP-II BIC Injection

11/08/2004 11:42:25

Luminosity 0 /ub/sec Fill Maximum 0

Specific Luminosity 0.00

0.0 ma Ring Current -0.0 ma

1.8 ua/sec Ring dI/dt -1.2 ua/sec

0.0 min Ring Lifetime 0.0 min

0.00 Inj. Efficiency 0.00

0 500

None

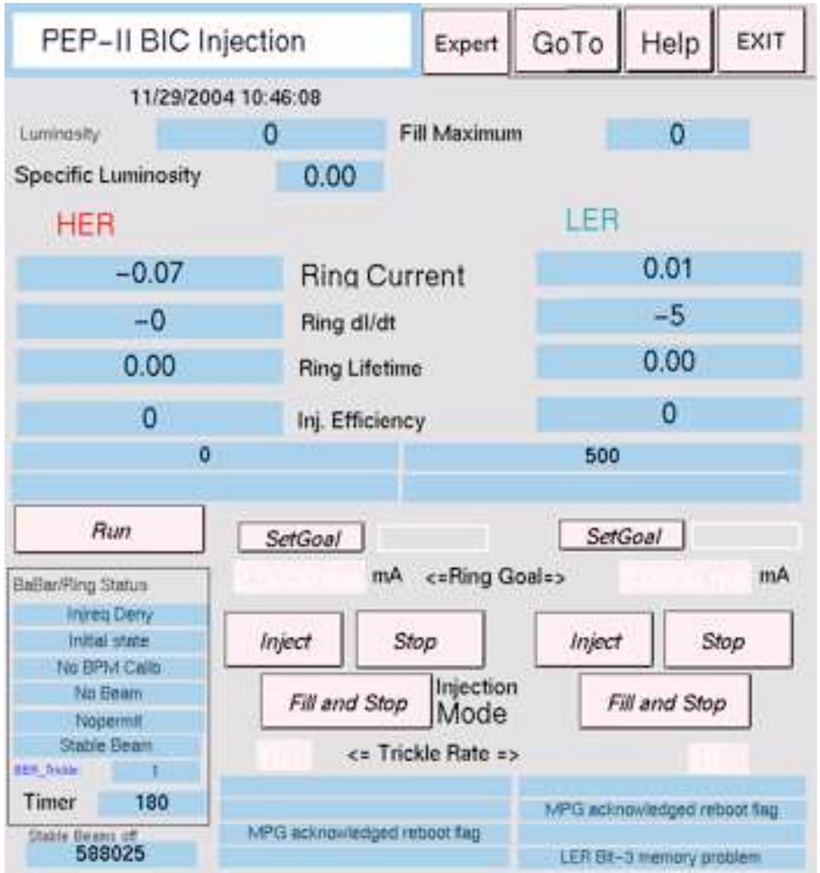
2.0 mA <=Ring Goal=> 3.0 mA

BaBar/Ring Status
Injreq Deny
Initial state
No BPM Calib
No Beam
Nopermit
Stable Beam
BBR_Trickle: 1
Timer 180 s
Stable Beams off
1212933 sec

10 <= Trickle Rate => 10

Already Stopped
Successfully loaded goal
From 0 to 0 by 1

MPS acknowledged reboot flag
LER Bit-3 memory problem



PEP-II BIC Injection

11/29/2004 10:46:08

Luminosity 0 Fill Maximum 0

Specific Luminosity 0.00

-0.07 Ring Current 0.01

-0 Ring dI/dt -5

0.00 Ring Lifetime 0.00

0 Inj. Efficiency 0

0 500

mA <=Ring Goal=> mA

BaBar/Ring Status
Injreq Deny
Initial state
No BPM Calib
No Beam
Nopermit
Stable Beam
BBR_Trickle 1
Timer 180
Stable Beams off
588025

<= Trickle Rate =>

MPG acknowledged reboot flag

MPG acknowledged reboot flag
LER Bit-3 memory problem

Further information for use

- User manual gives more details and instructions for use:

  http://www.slac.stanford.edu/comp/unix/package/epics/lcls/badlfish

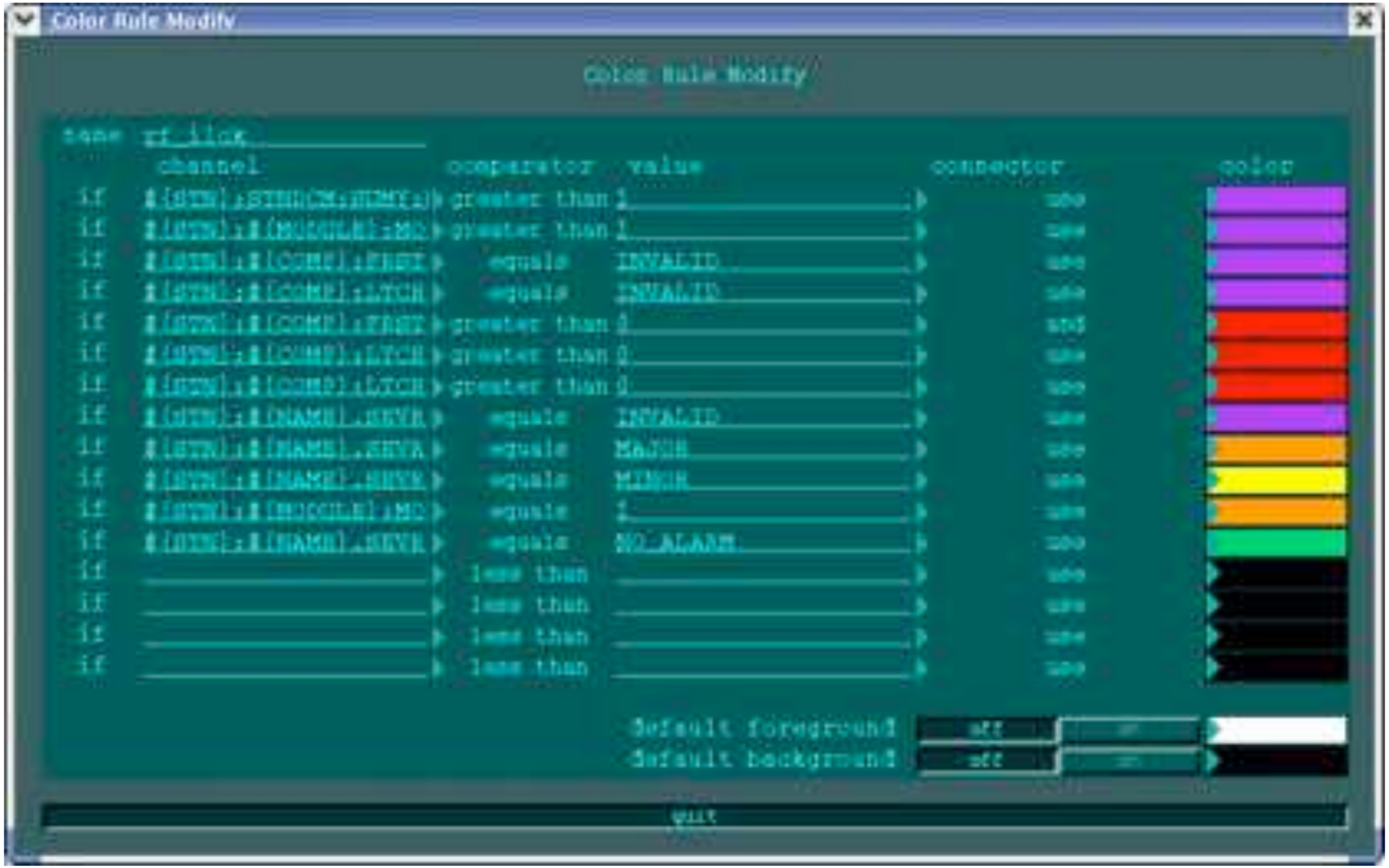
- The basic steps are:
  - Download the tarball and modify the run* scripts for your setup (where the .adl files are, where badlfish is, etc)
  - Run badlfish to translate .adl files
  - Intervene midway through (optional) to change anything in color map or color rule lookup tables
  - Update your colors.list with new colors and menumap
  - Run new .edl screens with EDM

Summary and future enhancements

- Badlfish is a tool available to translate EDD/DM displays to EDM
- Byte translation needs work
- Valuator, menu and file menu not yet implemented

Additional slides

Complex (multi-PV) color rule



Color Rule Modify

name rf_lock

	channel	comparator	value	connector	color
if	$(STN):STNDCM:HDMY(s)	greater than	1	use	🟪
if	$(STN):$(MODULE):MO	greater than	1	use	🟪
if	$(STN):$(COMP):FRST	equals	INVALID	use	🟪
if	$(STN):$(COMP):LTCH	equals	INVALID	use	🟪
if	$(STN):$(COMP):FRST	greater than	0	and	🟥
if	$(STN):$(COMP):LTCH	greater than	0	use	🟥
if	$(STN):$(COMP):LTCH	greater than	0	use	🟥
if	$(STN):$(NAME).SEVR	equals	INVALID	use	🟪
if	$(STN):$(NAME).SEVR	equals	MAJOR	use	🟧
if	$(STN):$(NAME).SEVR	equals	MINOR	use	🟨
if	$(STN):$(MODULE):MO	equals	1	use	🟧
if	$(STN):$(NAME).SEVR	equals	NO_ALARM	use	🟩
if		less than		use	⬛
if		less than		use	⬛
if		less than		use	⬛
if		less than		use	⬛

default foreground off on ⬜
default background off on ⬛

Complex (multi-PV) color rule

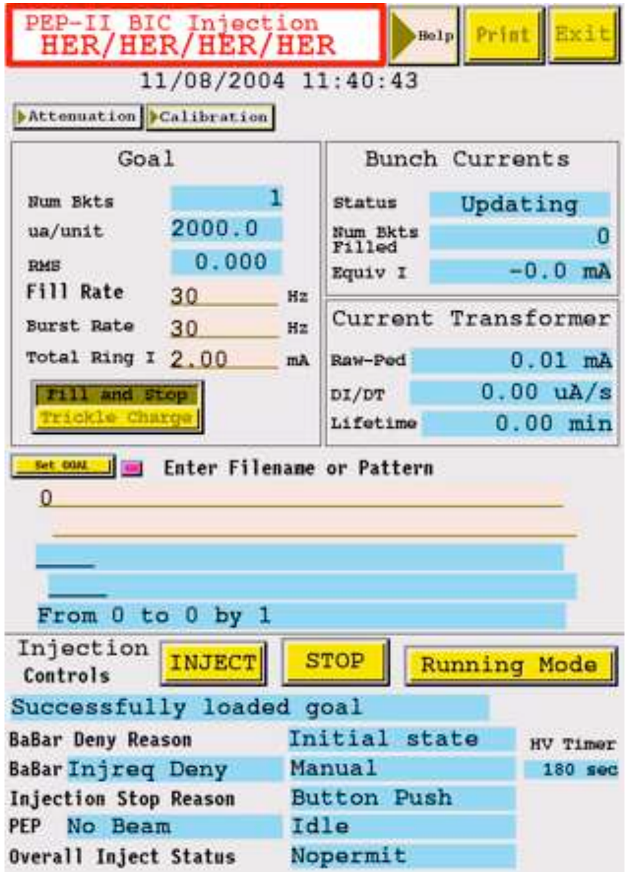
rule	name	type	calc	clr
1	rf_ilck	c	CALC\{($(STN):STNDCM:SUMY:MODU.SEVR>1)?30:($(STN):$(MODULE):MODU.SEVR>1)?30:($(STN):$(COMP):FRST.SEVR==-1)?30:($(STN):$(COMP):LTCH.SEVR==-1)?30:($(STN):$(COMP):FRST.SEVR>0)?3:($(STN):$(COMP):LTCH.SEVR>0)?3:($(STN):$(COMP):LTCH.SEVR>0)?24:($(STN):$(NAME).SEVR==1)?30:($(STN):$(NAME).SEVR==2)?23:($(STN):$(NAME).SEVR==1)?4:($(STN):$(MODULE):MODU.SEVR==1)?23:($(STN):$(NAME).SEVR==0)?6:14)}	85

Complex (multi-PV) color rule

New color for EDM color definition file looks like this:

```
rule 85 rf_ilck {
 = 30   :"Controller/alt"
 = 30   :"Controller/alt"
 = 30   :"Controller/alt"
 = 30   :"Controller/alt"
 = 3    :"GLOBAL canvas"
 = 3    :"GLOBAL canvas"
 = 24   :"red-24"
 = 30   :"Controller/alt"
 = 23   :"red-23"
 = 4    :"grey-4"
 = 23   :"red-23"
 = 6    :"GLOBAL title"
}
```

Example translations



PEP-II BIC Injection
HER/HER/HER/HER

11/08/2004 11:40:43

Goal
Num Bkts 1
ua/unit 2000.0
RMS 0.000
Fill Rate 30 Hz
Burst Rate 30 Hz
Total Ring I 2.00 mA

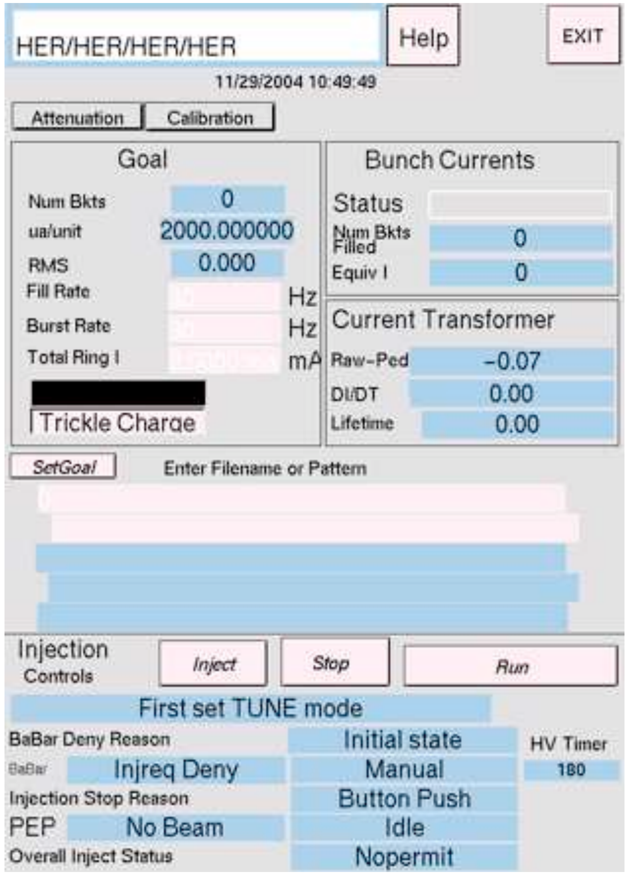
Bunch Currents
Status Updating
Num Bkts Filled 0
Equiv I -0.0 mA

Current Transformer
Raw-Ped 0.01 mA
DI/DT 0.00 uA/s
Lifetime 0.00 min

Enter Filename or Pattern
0
From 0 to 0 by 1

Injection Controls

Successfully loaded goal
BaBar Deny Reason Initial state
BaBar Injreq Deny Manual
Injection Stop Reason Button Push
PEP No Beam Idle
Overall Inject Status Nopermit
HV Timer 180 sec



HER/HER/HER/HER

11/29/2004 10:49:49

Goal
Num Bkts 0
ua/unit 2000.000000
RMS 0.000
Fill Rate Hz
Burst Rate Hz
Total Ring I mA

Bunch Currents
Status
Num Bkts Filled 0
Equiv I 0

Current Transformer
Raw-Ped -0.07
DI/DT 0.00
Lifetime 0.00

Enter Filename or Pattern

Injection Controls

First set TUNE mode
BaBar Deny Reason Initial state
BaBar Injreq Deny Manual
Injection Stop Reason Button Push
PEP No Beam Idle
Overall Inject Status Nopermit
HV Timer 180