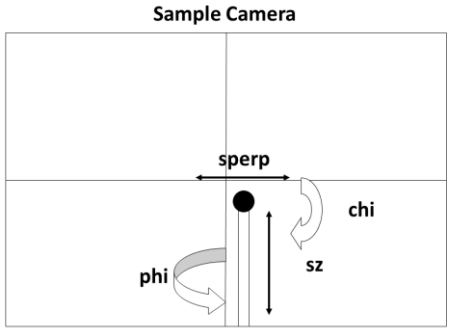
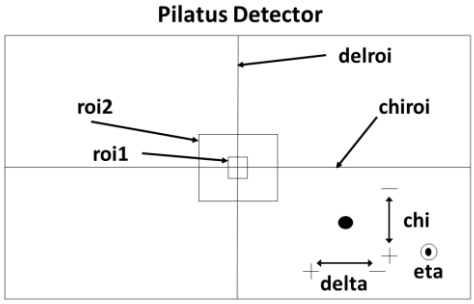
I16 Cheatsheet

Command	Description
pos X	display current value of X
pos X p	move X to position p
inc X i	move X by increment i
scan X p1 p2 i opt	scan X from p1 to p2 in increments of i, store opt at each point
scancn X i pt opt	scan X around current position in increments of i and pt steps
go maxpos/peak	move to posiiton of maximum intensity/ fitted pea centre of last scan
go lcen / rcen	move to position 1 scan width left / right
go edge(0,'sz','apd')[1]	move to middle point in edge scan
addref [h,k,l] 'name'	save current angles as a reflection (hkl)
ub	shows all saved reflections
calcub	generate UB matrix from 2 reflections
c2th([h,k,l])	2*Theta angle (Delta) of a reflection (hkl)
print X	prints X to terminal (and log file)
sim hkl [h,k,l]	calculates the required angles for (hkl) (depends on euler mode)
checkbeam	checks status of the beam using ion chamber
con	See the current diffractometer constraints - determines angles calculated in sim hkl [h,k,l]



pos eta 20 to put sample-beam direction into camera



Vertical geometry

Scanning Examples	Description
scancn eta 0.01 41 pil 0.1 roi1	centred scan of eta using Pilatus, 0.1s per exposure, record roi1 at each point
scan delta 35 36 0.01 pil 1 roi2 delroi	scan delta from 35 to 36 in steps of 0.01, use Pilatus (1 s), record roi2+delroi
scan energy 7.69 7.75 0.001 hkl [0,0,3] pol 90 t 1	scan energy, move to hkl, realign analyser, record APD for 1 s
scan sx -1.0 -0.5 0.05 sy -0.6 1.6 0.05 pil 1 roi1 roi2	2D scan of sx and sy using Pilatus

I16 Data Viewer

- On the I16User Desktop, double click "I16 Data Viewer", then select "Display in Terminal"

You can download the Python software: https://github.com/DanPorter/Py16

Scannables / Pseudo Devices (X)

Beamline	Description
shutter	Beam shutter (0 = closed, 1 = open)
x1	fast shutter (0 = closed, 1 = open)
pol	rotate analyser crystal (0=σσ, 90=σπ)
atten	attenuator (0-255)
ss	Sample slits size in mm (before sample) [horizontal , vertical]
ds	Detector slipt size in mm (before analyser) [horizontal, vertical]

Detectors	Description
pil3	pilatus detector exposure (e.g. *pos pil 1* for 1 second exposure)
diode	record diode output (usually use *w .1 diode*)
t	APD detector exposure (e.g. *pos t 1* for 1 s exposure)
bpm	Beam position monitor (before sample slits, after attenuator)
merlin	Merlin area detector (mtthp angle to analyser crystal)

Diffractometer Vertical Geometry	Description	Limits (rough)
chi	chi angle (composite angle perpendicular to beam)	98-0 Deg
eta	eta angle (parallel to beam, ~sample theta)	0-110 Deg & < Delta
delta	delta angle (detector arm, sample 2theta), depends on pos do	0-130 Deg & > eta
phi	phi angle (sample rotation, kphi is real motor)	0-360 Deg
kphi	kphi angle (motor rotation)	-90-270 Deg

Diffractometer Horizontal Geometry	Description	Limits (rough)
chi	chi angle (composite angle perpendicular to beam)	90 – -90 Deg
mu	mu angle (parallel to beam, ~sample theta)	0-100 Deg
gam	gamma angle (detector arm, sample 2theta)	0-100 Deg

Sample Position	Description
sx / sy	sample movement x / y in mm
sz	sample height in mm (up/down on stick)
sperp	sample movement (x,y) ⊥ to beam (across screen)
spara	sample movement (x,y) ∥ to beam

(h,k,l)	Description
h / k / l	move to calculated h / k / l
hkl	move to calculated hkl (pos hkl [0,0,12])

Others	Description
tset	set temperature set point
w	wait (e.g. w 10 = wait 10 s)
x	dummy variable (scan c 1 10 1 w 1)