1.2.1 Calibration of area detectors (common_mode options)

LCLS supports a variety of area detectors, from simple monolithic CCDs to tiled gain-switching detectors that have option noise removal algorithms assigned to them.

smalldata_tools DetObject attempts to do the best for each detector type, but it is important to note that 'best' can depend on your physics through occupancy related effects.

We are using single numbers indicating what corrections should be applied, so the default behavior can be changed.

common_mode	Brief Description	Detector	Comment
-2	raw	epix10k	full raw
-1	raw	Pulnix Opal Zyla, iStar ControlsCamera Alvium AndOR Fli icarus Cspad, cs140 epix10k	raw (epix10k gain bits masked)
0	pedestal subtracted	**Pulnix** **Opal** **Zyla, iStar** **ControlsCamera** **Alvium** **AndOR** **Fli** **icarus** **Cspad2M**, cs140	
5	unbonded pixels	CsPad2M, Cs140k	cmpars=(5,100)
55	unbonded pixels	Cs140k	cmpars=(5,5000)
1	asic-wise zero photon peak finding (gated mean method)	CsPad2M, **Cs140k**	cmpars=(1,25,40,100,0)
10	use 1 if possible, otherwise 5	CsPad2M, Cs140k	cmpars=(1,25,40,100,1)
0	standard gain/offset corrections, no common mode	**Jungfrau**	cmpars=(7,0,10)
7	standard gain/offset corrections, common mode in row&columns	Jungfrau	cmpars=(7,3,10,10)
71	standard gain/offset corrections, common mode in rows	Jungfrau	cmpars=(7,1,10,10)
72	standard gain/offset corrections, common mode in columns	Jungfrau	cmpars=(7,2,10,10)
80	standard gain/offset corrections, but no common mode	**Epix10k2M** **Epix10k Quad** **epix10k-135**	cmpars=(7,0,10)

81	correction applied on det.raw was trying to replicate det.calib during early data taking - def not working for gain switching	Epix10k2M Epix10k Quad	deprecated
82	based on 81 & use of env rows unbonded pixels	Epix10k2M Epix10k Quad	don't think this ever worked.
84	standard gain/offset corrections, common mode in rows	Epix10k2M Epix10k Quad epix10k-135	cmpars=(7,2,10,10)
85	standard gain/offset corrections, common mode in rows&columns	Epix10k2M Epix10k Quad epix10k-135	cmpars=(7,3,10,10)
180	ghost corrected 80 (use only for Dec 2018 exp)	Epix10k2M	deprecated
181	ghost corrected 81 (use only for Dec 2018 exp)	Epix10k2M	deprecated
4	median, rows&columns	epix100	cmpars=(4,6,40,10)
34	median, rows&columns	epix100	cmpars=(4,6,100,100)
6	median after neighbor removal	**epix100**	cmpars=(6)
45	median after 'photon' removal, smalldata_tools code	epix100	
46	median after 'photon' removal, smalldata_tools code, zero whole detector	epix100	
47	median after 'photon' removal, smalldata_tools code, zero banks	epix100	
98	calculate common mode using unbonded rows	icarus	
99	calculate&apply common mode using unbonded rows	icarus	
30	det.calib()	ALL	can change w/ release w/o notice depending on what is considered best.