

Croatian Meteor Network

IMC2014



**Croatian Meteor Network:
Automatic Data Acquisition and
Processing Tool
&
CMN_binViewer**

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Introduction

- Year long problem of manual data processing
- CMN next step: data analysis
 - New meteor showers
- Automatic processing software needed!

Why new software?

- **Skypatrol** issues:
 - 6 seconds between exposures
 - No automatic way of running and stopping
 - Can't record >2 concurrent events
- Time consuming manual processing
- Lagging with data processing **>1 year**
- **UFOorbit** orbits

Software requirements

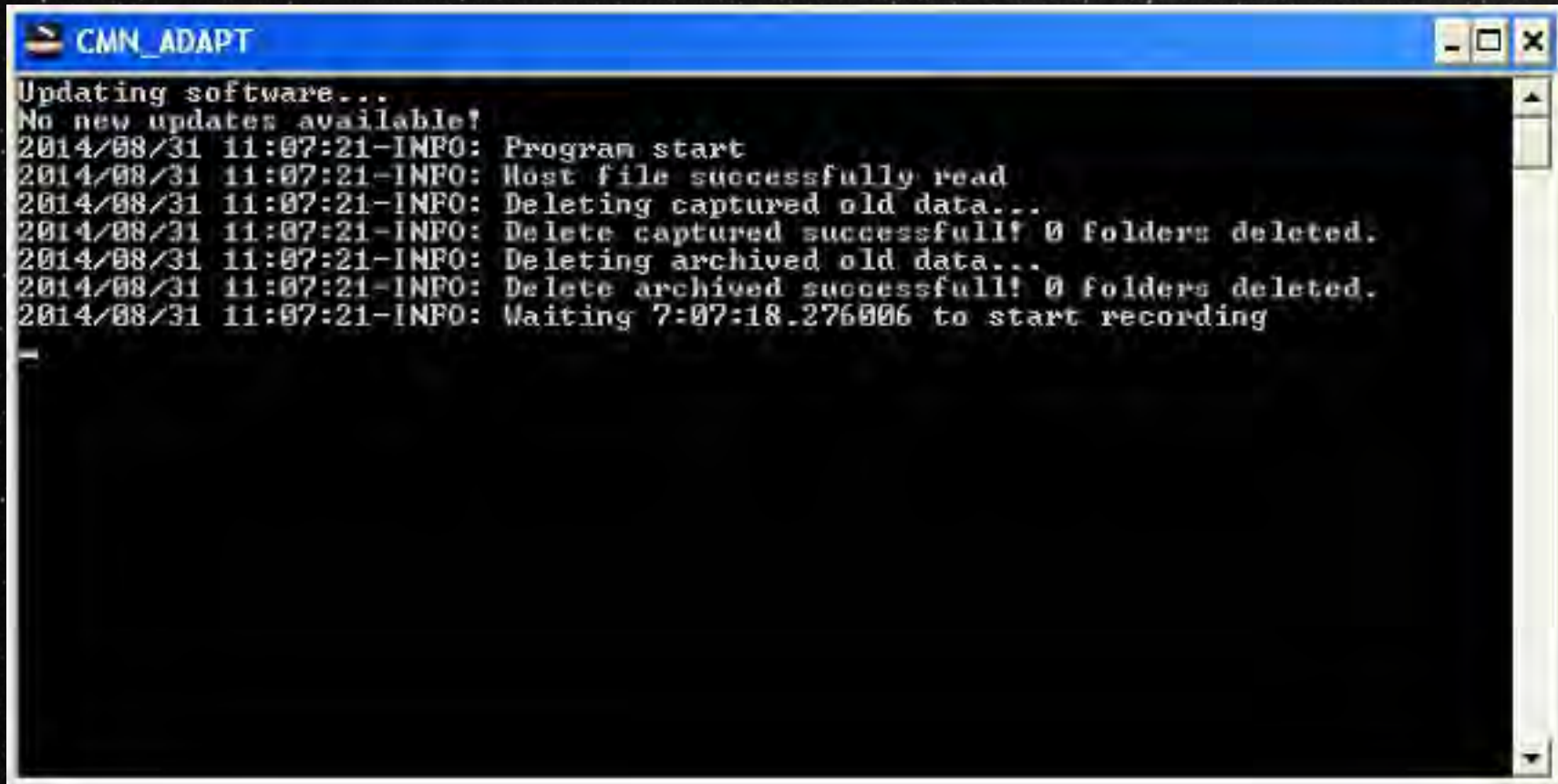
- Modern recording software
- **Fully automated**
- Minimum station operator intervention
- Minimum raw data in local storage
- Data prepared for orbit calculation
- Offline mode
- Porting capabilities (to Linux)

CMN_ADAPT

- **Automatic Data Acquisition and Processing Tool**



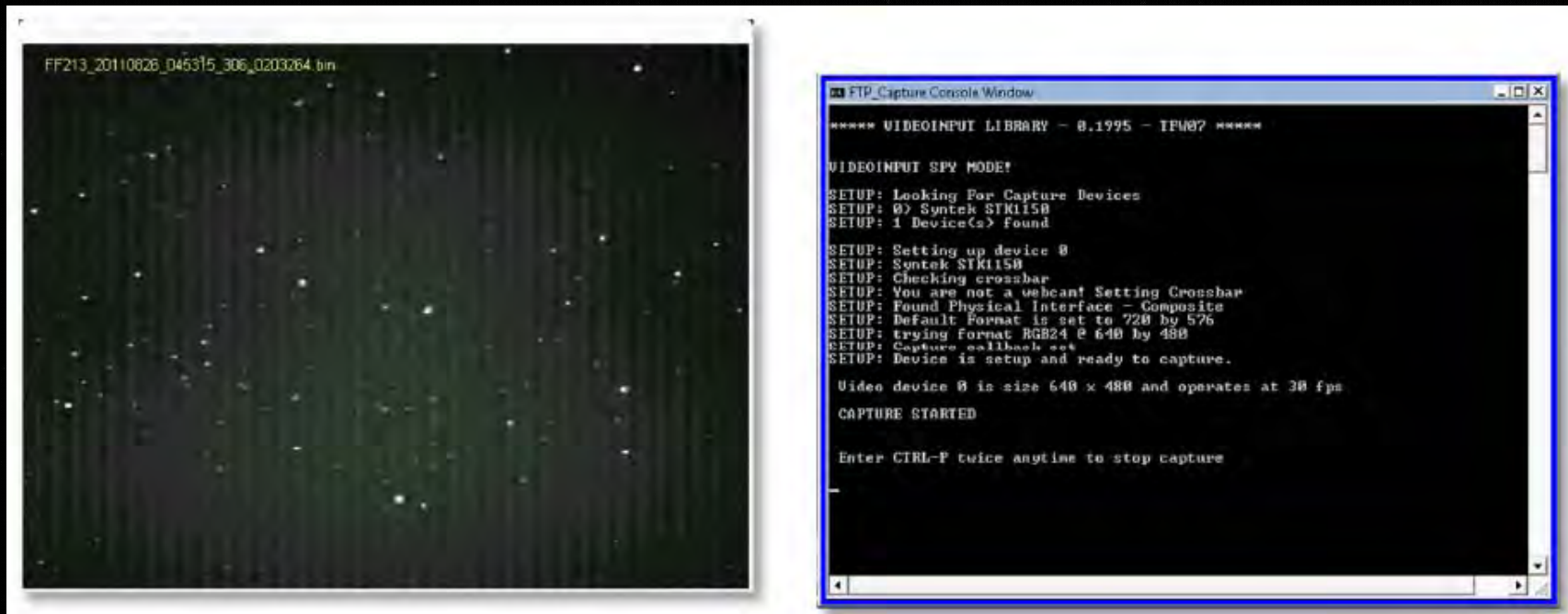
Preparation for recording

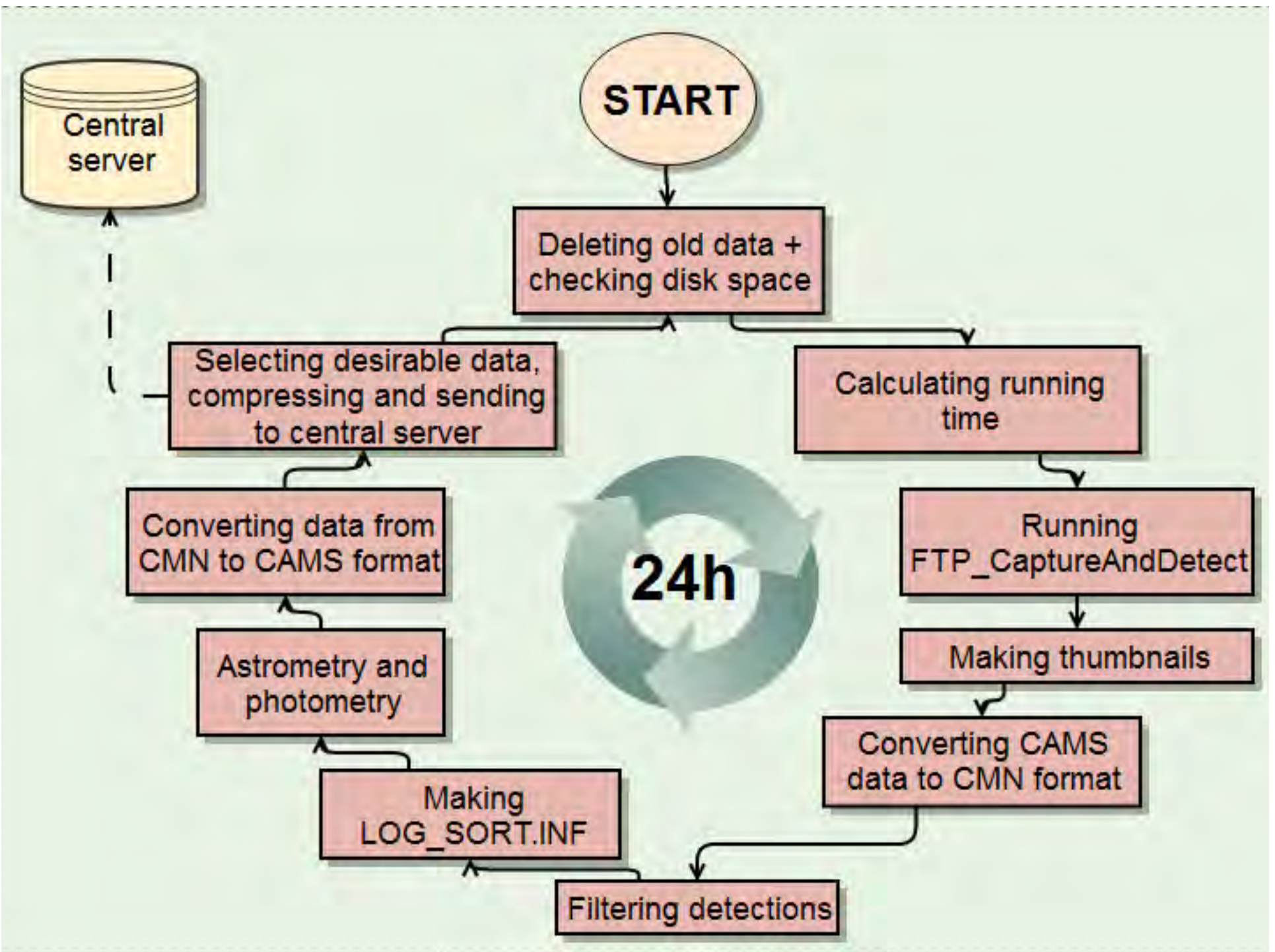


```
CMN_ADAPT
Updating software...
No new updates available!
2014/08/31 11:07:21-INFO: Program start
2014/08/31 11:07:21-INFO: Host file successfully read
2014/08/31 11:07:21-INFO: Deleting captured old data...
2014/08/31 11:07:21-INFO: Delete captured successfull! 0 folders deleted.
2014/08/31 11:07:21-INFO: Deleting archived old data...
2014/08/31 11:07:21-INFO: Delete archived successfull! 0 folders deleted.
2014/08/31 11:07:21-INFO: Waiting 7:07:18.276006 to start recording
```

Recording and detection

- FTP_CaptureAndDetect by Peter Gural






What we get

- Fully processed data
 - Filtered (removed bats, aeroplanes, birds...)
 - Astrometry done
 - Photometry done
 - Uploaded to server → Ready for orbit estimation
- CMN status report
 - Thumbnails

CMN Status report

- Every day at 22:00h

CMN status 2014081415 - ALERT! - FIREBALL ALERT! Inbox x HMM x Print Share

 ██████████@gmail.com Aug 15 (4 days ago) ☆ Reply to all

to me, zandreic, gljaljic, damir.segon

ACHTUNG, ACHTUNG!
The following stations are not working properly:

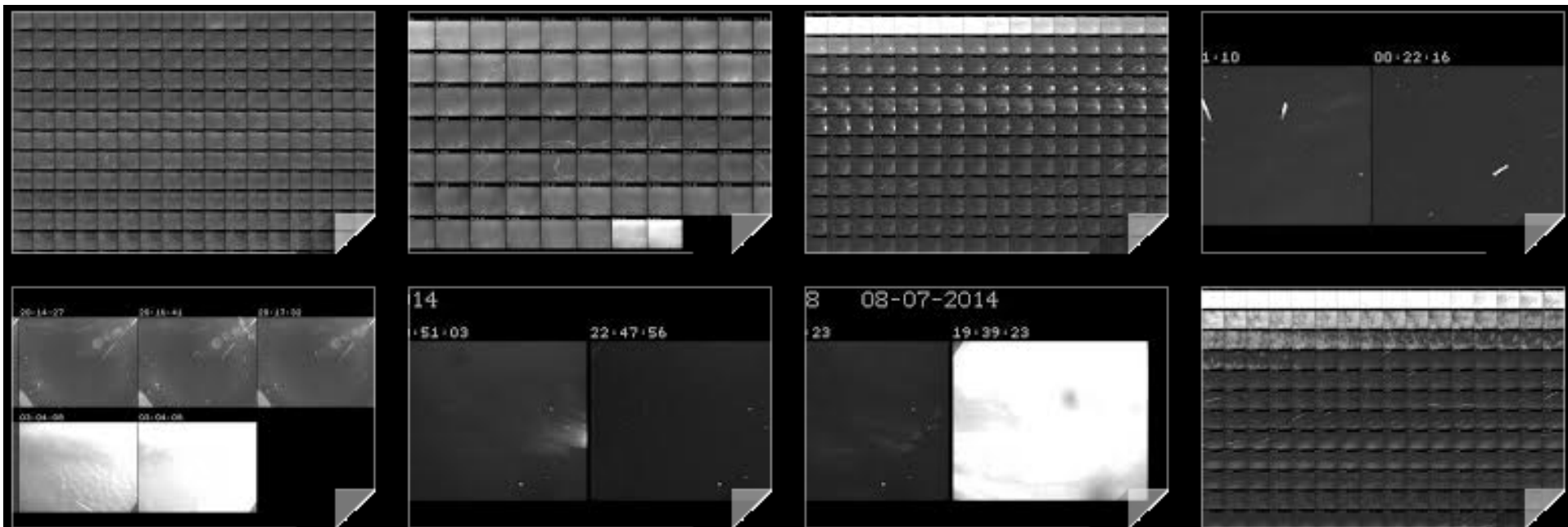
- bpalanka
- ogulin
- valpovoa
- krizevci
- brocanac
- zagrebm
- sisak1
- sisak2
- hum

} Offline stations → Call operators

The following fireballs were detected:

Station	Time	Image_number	Max_value	Mean	Std_dev	Duration (sec)
visnjan1	19:09:22:666	C_00000138-0003	4053	2546	844	0.98
pulaa	19:09:23:579	C_00000150-0001	8523	6313	2007	0.3
apevec	19:41:03:309	C_00000368-0001	1221	834	236	0.5
zagrebt	19:50:11:426	C_00000450-0005	5633	924	1365	0.8
petrovsko	19:50:11:744	C_00000103-0001	4181	1476	1064	1.76
visnjan2	20:57:13:464	C_00000746-0001	2512	1281	647	0.74
rijekaa	20:57:13:623	C_00000778-0003	1571	951	455	0.54
rijekab	20:57:13:638	C_00000785-0003	2314	1161	650	0.82

} Fireballs



455 08-18-2014



What about Skypatrol?

- Special version with Skypatrol recording
 - For old PCs
 - All ADAPT features remain
- Future plans:
 - Converting old Skypatrol data to CAMS format
 - multi-track coincidence into orbits done via CAMS software
 - Comparison with UFOorbit

CMN_binViewer

- compatible with CAMS standard data files (FF*.bin)
- New way of going through images needed
 - Easy usage with intuitive GUI
 - Saving images and animations
 - Using applying frames (dark, flat)
 - Correcting image levels
 - Meteor velocity visible
 - Playing video clip

Mode

Captured Detected

Min. frames (0 - 255):

Filters

Maxpixel Colorized Detection only Avgpixel Odd Even VIDEO

Sort FF*.bins

Folder:

Calibration & image features

Dark frame

Flat frame

Deinterlace Hold levels

- FF459_20140812_190304_301_0020992.bin
- FF459_20140812_190609_535_0025600.bin
- FF459_20140812_191149_707_0034048.bin
- FF459_20140812_200203_261_0108800.bin
- FF459_20140812_201150_652_0123392.bin
- FF459_20140812_202635_590_0145408.bin
- FF459_20140812_204833_396_0178176.bin
- FF459_20140812_210512_852_0203008.bin
- FF459_20140812_210838_852_0208128.bin
- FF459_20140812_212029_570_0225792.bin
- FF459_20140812_212833_210_0237824.bin
- FF459_20140812_213331_841_0245248.bin
- FF459_20140812_213535_513_0248320.bin
- FF459_20140812_214838_434_0267776.bin
- FF459_20140812_215601_591_0278784.bin
- FF459_20140812_220436_700_0291584.bin
- FF459_20140812_220538_575_0293120.bin
- FF459_20140812_221047_700_0300800.bin
- FF459_20140812_221525_928_0307712.bin
- FF459_20140812_221648_412_0309760.bin
- FF459_20140812_222045_287_0315648.bin
- FF459_20140812_222828_881_0327168.bin
- FF459_20140812_223337_863_0334848.bin
- FF459_20140812_223643_301_0339456.bin
- FF459_20140812_224304_535_0348928.bin
- FF459_20140812_224518_350_0352256.bin
- FF459_20140812_224946_100_0358912.bin
- FF459_20140812_225159_897_0362240.bin
- FF459_20140812_230716_020_0385024.bin
- FF459_20140812_231306_192_0393728.bin
- FF459_20140812_231418_299_0395520.bin
- FF459_20140812_231601_299_0398080.bin
- FF459_20140812_231652_705_0399360.bin
- FF459_20140812_232242_783_0408064.bin
- FF459_20140812_232629_455_0413696.bin
- FF459_20140812_232924_508_0418048.bin
- FF459_20140812_233138_352_0421376.bin



2014-08-12 21:33:31.841 FFF

Save image

Save Embed name

Save as...

Image levels

54

Gamma: 1.58

Save animation

Start Frame: Embed name

End Frame: Repeat

FPS: Per field

View image

Mode

Captured Detected

Min. frames (0 - 255):

Filters

Maxpixel Colorized Detection only Avgpixel Odd Even VIDEO

Sort FF*.bins

Folder:

Calibration & image features

Dark frame

Flat frame

Deinterlace Hold levels

- FF459_20140812_190304_301_0020992.bin
- FF459_20140812_190609_535_0025600.bin
- FF459_20140812_191149_707_0034048.bin
- FF459_20140812_200203_261_0108800.bin
- FF459_20140812_201150_652_0123392.bin
- FF459_20140812_202635_590_0145408.bin
- FF459_20140812_204833_396_0178176.bin
- FF459_20140812_210512_852_0203008.bin
- FF459_20140812_210838_852_0208128.bin
- FF459_20140812_212029_570_0225792.bin
- FF459_20140812_212833_210_0237824.bin
- FF459_20140812_213331_841_0245248.bin
- FF459_20140812_213535_513_0248320.bin
- FF459_20140812_214838_434_0267776.bin
- FF459_20140812_215601_591_0278784.bin
- FF459_20140812_220436_700_0291584.bin
- FF459_20140812_220538_575_0293120.bin
- FF459_20140812_221047_700_0300800.bin
- FF459_20140812_221525_928_0307712.bin
- FF459_20140812_221648_412_0309760.bin
- FF459_20140812_222045_287_0315648.bin
- FF459_20140812_222828_881_0327168.bin
- FF459_20140812_223337_863_0334848.bin
- FF459_20140812_223643_301_0339456.bin
- FF459_20140812_224304_535_0348928.bin
- FF459_20140812_224518_350_0352256.bin
- FF459_20140812_224946_100_0358912.bin
- FF459_20140812_225159_897_0362240.bin
- FF459_20140812_230716_020_0385024.bin
- FF459_20140812_231306_192_0393728.bin
- FF459_20140812_231418_299_0395520.bin
- FF459_20140812_231601_299_0398080.bin
- FF459_20140812_231652_705_0399360.bin
- FF459_20140812_232242_783_0408064.bin
- FF459_20140812_232629_455_0413696.bin
- FF459_20140812_232924_508_0418048.bin
- FF459_20140812_233138_352_0421376.bin



2014-08-12 21:33:31.841 FFF

Save image

Save Embed name

Save as...

Image levels

20

Gamma: 1.78

Save animation

Start Frame: Embed name

End Frame: Repeat

FPS: Per field

Mode

Captured Detected

Min. frames (0 - 255):

Filters

Maxpixel Colorized Detection only Avgpixel Odd Even VIDEO

Sort FF*.bins

Folder:

Calibration & image features

Dark frame

Flat frame

Deinterlace Hold levels

- FF459_20140812_190304_301_0020992.bin Fr 035 - 037
- FF459_20140812_190304_301_0020992.bin Fr 044 - 050
- FF459_20140812_190609_535_0025600.bin Fr 127 - 133
- FF459_20140812_191149_707_0034048.bin Fr 112 - 113
- FF459_20140812_200203_261_0108800.bin Fr 116 - 124
- FF459_20140812_201150_652_0123392.bin Fr 032 - 039
- FF459_20140812_201150_652_0123392.bin Fr 042 - 044
- FF459_20140812_202635_590_0145408.bin Fr 000 - 001
- FF459_20140812_204833_396_0178176.bin Fr 120 - 122
- FF459_20140812_210512_852_0203008.bin Fr 092 - 099
- FF459_20140812_210838_852_0208128.bin Fr 177 - 182
- FF459_20140812_212029_570_0225792.bin Fr 199 - 208
- FF459_20140812_212833_210_0237824.bin Fr 138 - 144
- FF459_20140812_213331_841_0245248.bin Fr 016 - 028
- FF459_20140812_213535_513_0248320.bin Fr 130 - 137
- FF459_20140812_214838_434_0267776.bin Fr 029 - 034
- FF459_20140812_215601_591_0278784.bin Fr 000 - 002
- FF459_20140812_220436_700_0291584.bin Fr 000 - 001
- FF459_20140812_220538_575_0293120.bin Fr 127 - 142
- FF459_20140812_221047_700_0300800.bin Fr 208 - 223
- FF459_20140812_221525_928_0307712.bin Fr 181 - 221
- FF459_20140812_221648_412_0309760.bin Fr 016 - 018
- FF459_20140812_222045_287_0315648.bin Fr 099 - 105
- FF459_20140812_222828_881_0327168.bin Fr 000 - 001
- FF459_20140812_223337_863_0334848.bin Fr 006 - 009
- FF459_20140812_223643_301_0339456.bin Fr 152 - 153
- FF459_20140812_224304_535_0348928.bin Fr 188 - 194
- FF459_20140812_224518_350_0352256.bin Fr 054 - 059
- FF459_20140812_224946_100_0358912.bin Fr 248 - 249
- FF459_20140812_225159_897_0362240.bin Fr 024 - 030
- FF459_20140812_230716_020_0385024.bin Fr 072 - 082
- FF459_20140812_231306_192_0393728.bin Fr 000 - 002
- FF459_20140812_231418_299_0395520.bin Fr 000 - 006
- FF459_20140812_231601_299_0398080.bin Fr 002 - 004
- FF459_20140812_231652_705_0399360.bin Fr 245 - 246
- FF459_20140812_232242_783_0408064.bin Fr 000 - 002
- FF459_20140812_232629_455_0413696.bin Fr 000 - 012



2014-08-12 22:15:25.928 FFF

Save image

Save Embed name

Save as... Embed name

Image levels

12 256

Gamma: 0.91

Save animation

Start Frame: Embed name

End Frame: Repeat

FPS: Per field

Mode
 Captured Detected
Min. frames (0 - 255):

Filters
 Maxpixel Colorized Detection only Avgpixel Odd Even VIDEO

Sort FF*.bins
Folder:

Calibration & image features
 Dark frame
 Flat frame
 Deinterlace Hold levels

- FF459_20140812_190304_301_0020992.bin Fr 035 - 037
- FF459_20140812_190304_301_0020992.bin Fr 044 - 050
- FF459_20140812_190609_535_0025600.bin Fr 127 - 133
- FF459_20140812_191149_707_0034048.bin Fr 112 - 113
- FF459_20140812_200203_261_0108800.bin Fr 116 - 124
- FF459_20140812_201150_652_0123392.bin Fr 032 - 039
- FF459_20140812_201150_652_0123392.bin Fr 042 - 044
- FF459_20140812_202635_590_0145408.bin Fr 000 - 001
- FF459_20140812_204833_396_0178176.bin Fr 120 - 122
- FF459_20140812_210512_852_0203008.bin Fr 092 - 099
- FF459_20140812_210838_852_0208128.bin Fr 177 - 182
- FF459_20140812_212029_570_0225792.bin Fr 199 - 208
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- FF459_20140812_221525_928_0307712.bin Fr 181 - 221**
- FF459_20140812_221648_412_0309760.bin Fr 016 - 018
- FF459_20140812_222045_287_0315648.bin Fr 099 - 105
- FF459_20140812_222828_881_0327168.bin Fr 000 - 001
- FF459_20140812_223337_863_0334848.bin Fr 006 - 009
- FF459_20140812_223643_301_0339456.bin Fr 152 - 153
- FF459_20140812_224304_535_0348928.bin Fr 188 - 194
- FF459_20140812_224518_350_0352256.bin Fr 054 - 059
- FF459_20140812_224946_100_0358912.bin Fr 248 - 249
- FF459_20140812_225159_897_0362240.bin Fr 024 - 030
- FF459_20140812_230716_020_0385024.bin Fr 072 - 082
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- FF459_20140812_231418_299_0395520.bin Fr 000 - 006
- FF459_20140812_231601_299_0398080.bin Fr 002 - 004
- FF459_20140812_231652_705_0399360.bin Fr 245 - 246
- FF459_20140812_232242_783_0408064.bin Fr 000 - 002
- FF459_20140812_232629_455_0413696.bin Fr 000 - 012



2014-08-12 22:15:25.928 FFF

Save image
Save Embed name
Save as...

Image levels
12
Gamma: 0.91

Save animation
Start Frame: Embed name
End Frame: Repeat
FPS: Per field

FF459_20140812_221525_928_0307712.bin frame = 176.5



CMN_binViewer

- Free for download on CMN webpage
 - Compatible with FTP_CaptureAndDetection files
- Please report bugs and send requests for new features!



**Thank you for your attention!
Questions?**