Application Note – Using and Customizing XTM and XIM-CV Photometric Files (.ldt and .ies)

Version 20140827

Introduction

Xicato measures optics and reflectors using a goniophotometer, and makes the photometric files (.LDT and .IES) available to our customers for download. These files are representative when used with both XIM-CV and XTM, and have been created with a standard set of module parameters (1300lm, 80CRI, etc.). Although these files should be used for guidance and reference purposes only (not for lighting layouts or detailed calculations), customers may find the need to modify these files to represent the specific module of interest. An example of this would be to scale to 2000lm (vs standard 1300lm file) or to change the power and CRI value to represent Xicato's Artist Series.

This application note provides information as to how to modify these values and where these values are located within the files.

It is important to point out that photometric measurements of the actual luminaire using these optics should always be made, and the photometric files from these measurements should be the basis for all layouts and detailed designs.

Data Collection

As mentioned above, the data in the files is collected via goniometric measurement, and is representative of lumen output at a module Tc of 70C. The goniometer creates a test data file that (in the case of Xicato) is opened in Radiant Zemax Prosource data analysis software. From within Prosource both the .ldt and .ies files are created.

Application Across Modules

The default module used for all photometric files is XTM1980XX13CCA. Although the standard file name available for download references XTM, the photometric performance of XIM-CV is the same (each module uses the same remote phosphor optical element). Furthermore, studies were completed to characterize differences in photometric performance between lumen packages, CRI options, and CCT options, and the resultant differences were minimal and within standard measurement tolerances. Again, for the basis of design, it is recommended that the luminaire manufacturer conduct their own photometric testing with a production luminaire, module and optic.

File Description

NOTE: It is strongly recommended that no changes be made to these files other than those to the parameters delineated below. Failure to do so can result in the file not being read or displayed by any of the available viewing programs.

Both types of files are basic text files and can be edited like any others. Figures 1 and 2 are screen shots of the opened .ldt and .ies files respectively (in this case opened a basic text editor). Both files contain comment fields, data regarding the optical performance of the reflectors as well as electrical drive conditions and the angles over which the units were measured.

NOTE: The candela values in each of the files have been normalized (Cd/klm) and are not affected by changes in the total lumen value entered.

Note in Figure 1a that the .ldt file describes the results of measurements on a XTM 19mm LES, 80CRI, 1300lm, constant current, version A (XTM1980XX13CCA) operated at full power, at a module Tc of 70C, with reflector XSA-10. The total lumens (including adjustments for temperature), CCT and CRI can be edited to reflect any other module. If the total lumens are changed to reflect another Xicato module, the power (watts) may need to be changed accordingly to represent the product. It is also recommended that the header and comment lines (green highlights) are also changed to reflect the representative module and drive current. Remember to issue an appropriate filename reflecting the new system parameters. Figure 1b was created to reflect changing the .ldt file to a XTM 19mm LES, 95CRI, 2000lm, constant current, version A (XTM1995XX20CCA) .

Figure 2a illustrates the .ies format. The parameters of concern are the same as the .ldt files and can be edited as required. Note that the .ies file contains a multiplier number which should be set to the total module lumens divided by 1000. Once again all candela values have been normalized and are not affected by the total lumen value. Again, in Figure 2b the values have been changed to reflect the XTM 19mm LES, 95CRI, 2000lm, constant current, version A (XTM1995XX20CCA).

```
Xicato Inc, San Jose, CA USA (http://www.xicato.com)
1
1
1
180
91
1
Report XTM1980XX13CCA with XSA-10
"XTM1980XX13CCA with XSA-10"
"XTM1980XX13CCA with XSA-10 - typical module at 70C and 700mA"
XTM1980XX13CCA_XSA-10.LDT
7/11/2014 3:20:23 PM
70
0
48
19
0
0
0
0
0
100
73
1
0
1
1
"Xicato XTM1980XX13CCA-typical module at 70C, 700mA"
1300
3000
80
11.7
0.00
0.00
```

☐ = Total Module Lumens

☐ = CRI

☐ = Typical Module Power (watts)

Figure 1a .ldt file example - Data at the bottom is truncated.

```
Xicato Inc, San Jose, CA USA (http://www.xicato.com)
1
1
1
180
91
1
Report XTM1995XX20CCA with XSA-10
"XTM1995XX20CCA with XSA-10"
"XTM1995XX20CCA with XSA-10 - typical module at 70C and 1050mA"
XTM1995XX20CCA_XSA-10.LDT
7/11/2014 3:20:23 PM
70
0
48
19
0
0
0
0
100
73
1
0
1
1
"Xicato XTM1995XX20CCA-typical module at 70C, 1050mA"
2000
3000
95
19
0.00
0.00
```

☐ = Total Module Lumens

☐ = CRI

☐ = Typical Module Power (watts)

Figure 1b Modified .ldt file

```
IESNA91
[TEST] Report XTM1980XX13CCA with XSA-10
[MANUFAC]  Xicato Inc, San Jose, CA USA (http://www.xicato.com)
[LUMCAT] "XTM1980XX13CCA with XSA-10 - typical module at 70C and 700mA"
[LUMINAIRE] "XTM1980XX13CCA with XSA-10"
[LAMP] "XTM1980XX13CCA-typical module at 70C, 700mA"
TILT=NONE
1 1300 1.3 91 1 1 2 0 -0.019 0
1 1 11.7
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22
23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42
43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62
63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82
83 84 85 86 87 88 89 90
0
2587.218693 2593.581509 2578.898089 2540.231748 2476.603592
2385.566385 2264.67289 2114.902 1943.105981 1758.094882
1568.678758 1384.646554 1214.318876 1108.598248 952.9539909
835.9760742 754.2383667 662.2222649 599.5730041 547.6915849
505.5991128 470.8483509 441.9709573 417.4985898 394.9840117
373.4483282 352.4020922 331.8453035 311.7779621 291.7106208
271.6432794 252.0653854 231.998044 212.42015 191.8633613
171.3065726 150.2603365 128.7246531 106.6995224 93.4844439
71.94876049 51.88141913 34.26131452 21.04623606 12.23618376
5.873368203 2.447236751 0.48944735 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
```

☐ = Total Module Lumens

☐ = Lumen multiplier value. Must be equal to total lumens divided by 1000

☐ = Typical Module Power (watts)

Figure 2a .ies file example

```
IESNA91
[TEST] Report XTM1995XX20CCA with XSA-10
[MANUFAC]  Xicato Inc, San Jose, CA USA (http://www.xicato.com)
[LUMCAT] "XTM1995XX20CCA with XSA-10 - typical module at 70C and 1050mA"
[LUMINAIRE] "XTM1995XX20CCA with XSA-10"
[LAMP] "XTM1995XX20CCA-typical module at 70C, 1050mA"
TILT=NONE
1 2000 2 91 1 1 2 0 -0.019 0
1 1 19
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22
23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42
43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62
63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82
83 84 85 86 87 88 89 90
0
2587.218693 2593.581509 2578.898089 2540.231748 2476.603592
2385.566385 2264.67289 2114.902 1943.105981 1758.094882
1568.678758 1384.646554 1214.318876 1108.598248 952.9539909
835.9760742 754.2383667 662.2222649 599.5730041 547.6915849
505.5991128 470.8483509 441.9709573 417.4985898 394.9840117
373.4483282 352.4020922 331.8453035 311.7779621 291.7106208
271.6432794 252.0653854 231.998044 212.42015 191.8633613
171.3065726 150.2603365 128.7246531 106.6995224 93.4844439
71.94876049 51.88141913 34.26131452 21.04623606 12.23618376
5.873368203 2.447236751 0.48944735 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
```

☐ = Total Module Lumens

☐ = Lumen multiplier value. Must be equal to total lumens divided by 1000

☐ = Typical Module Power (watts)

Figure 2b Modified .ies file