

# *Argos Ingegneria S.p.A.*



**October 2009**



**SMF/L**

## SMF/L – General description

SMF/L is a photometric measurement system for AGL equipment especially designed and developed by ARGOS INGEGNERIA to operate in the workshop of the airfield lights department.

SMF/L belongs to the ARGOS 's product family for AGL measurement. It is specially recommended for indoor operations of customers already equipped with ARGOS's mobile systems. It allows a precise measurement of all inset and elevated fittings of AGL in order to certificate the performances of fixture before the installation in the airfield.



The measurement is performed by a 13 sensors array which vertically scans the beam of the light under test to get the photometric values necessary to compute the light beam intensity in candela , elevation , azimuth and the isocandela diagram according to ICAO grid requirements. The measuring bar is equipped with a color sensing device according to CIE 1931 recommendation.

Measurement operations are fully automated and allow single step measurement, 7x13 grid points measurement, 13x13 extended grid points measurement. Manual positioning of the bar is also allowed for special measurements defined by user.

The system is fully controlled by a user friendly application software which includes all the functions necessary to create the data base, to set up the system parameters , to save, display and print the results of measurement, to compute and display the ICAO isocandela diagrams.

The system software runs on a Windows XP platform. All the data acquired during the measurement sessions are stored into the system data base and can be exported to other MS Office programs for any further application.

# SMF/L – System components

Main cabinet



Control signals



Emergency and control console

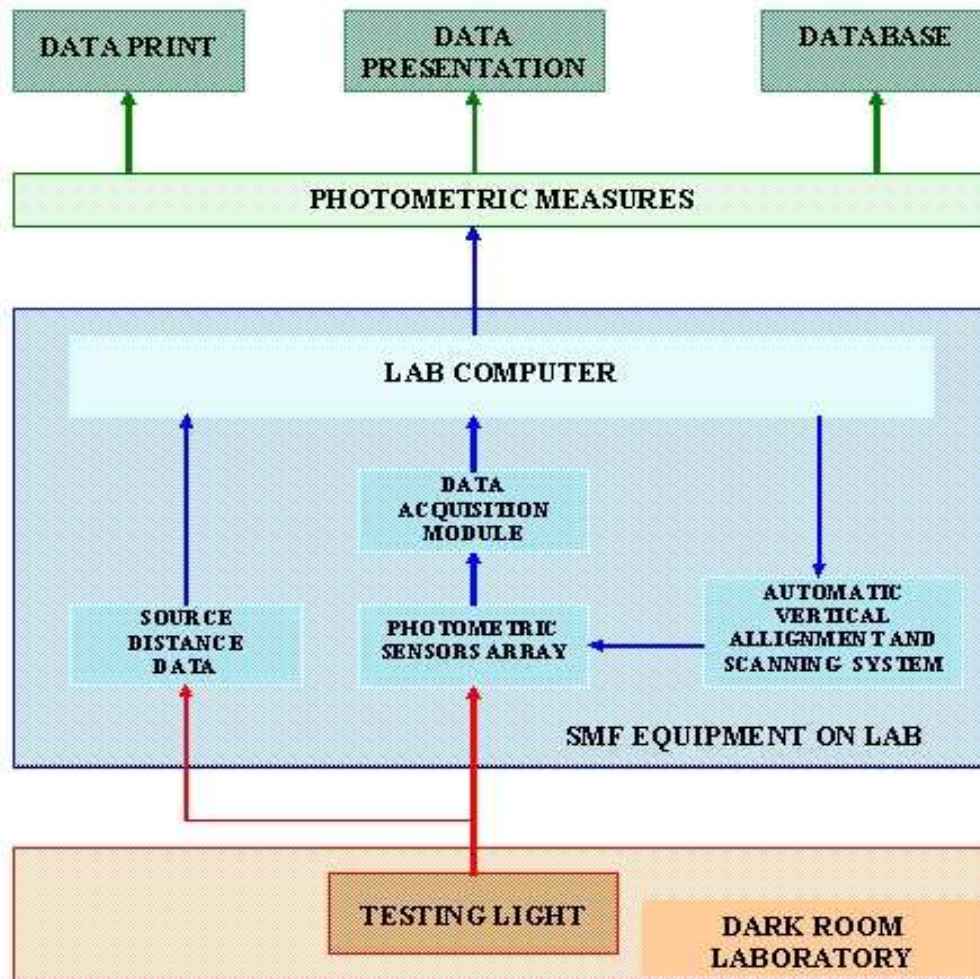
Ethernet



SMF – System Software



## SMF/L – System components



SMF/L Functional diagram

SMF/L integrates the same measurement components of SMF/F, with the following differences:

- Main power supply is 220 VAC;
- The system computer is a desktop PC

The system software is the same and allows the same functions, having set to 3m the distance of the bar from the special supports for fixtures provided with the main cabinet.

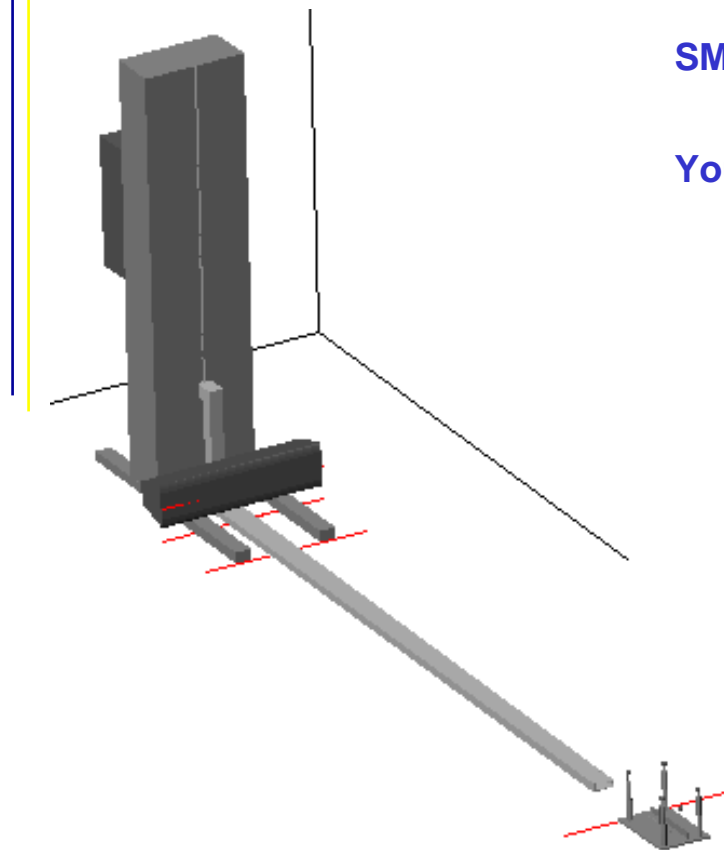
|         |                                 |
|---------|---------------------------------|
| CPU     | Intel Pentium IV, 3.0 GHz       |
| RAM     | 512 Mb DDR RAM                  |
| HDD     | 160 Gb                          |
| Storage | DVD/CD-RW                       |
| Display | 17"                             |
| COMM    | LAN/Modem 56 kbit/sec,<br>USB 2 |
| OS      | Windows XP Professional         |

SMF/L PC configuration

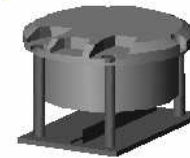
## SMF/L – Installation

SMF/L is very easy to install following the instructions given in the system manual.

You can fix on the floor the lamps' support using a pair of butterfly pivots in order to easily remove and change the support.



12" inset lamps support



8" inset lamps support



Taxiway edge lights support



Runway edge lights support



Elevated lights support



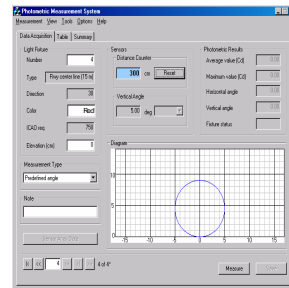
*Setting the position of special supports for lights alignment to the measurement bar*

## *SMF/L – System Performances*

- High precision computer controlled bar positioning system
- 13 LUX sensors with 1° spacing at 3 meters (ICAO), with 0.25 LUX resolution
- 1 Color measuring device conforming CIE 1931 recommendation (ICAO)
- 7x13 (ICAO) or 13x13 extended grid points diagram
- Average and maximum values (Cd) of beam intensity
- Vertical and horizontal angle determination
- SQL compatible system data base
- LAN communication
- Power supply: 220 Vac, 300 W
- Accuracy : +/- 3%
- Repeatability : +/- 2%

# SMF Photometric Measurement System

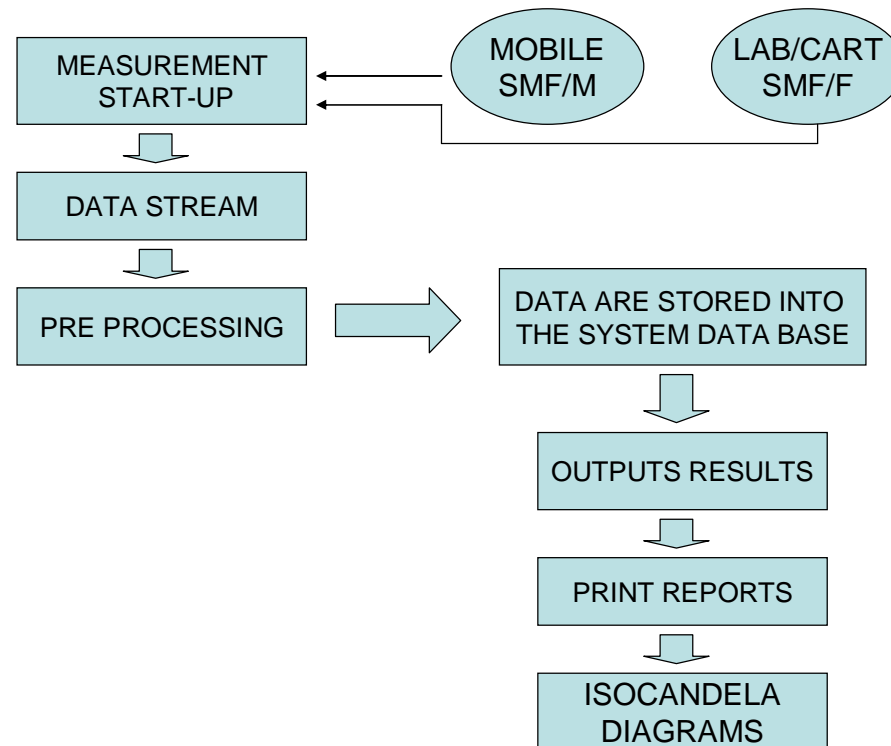
## SMF SYSTEM SOFTWARE (PMS)

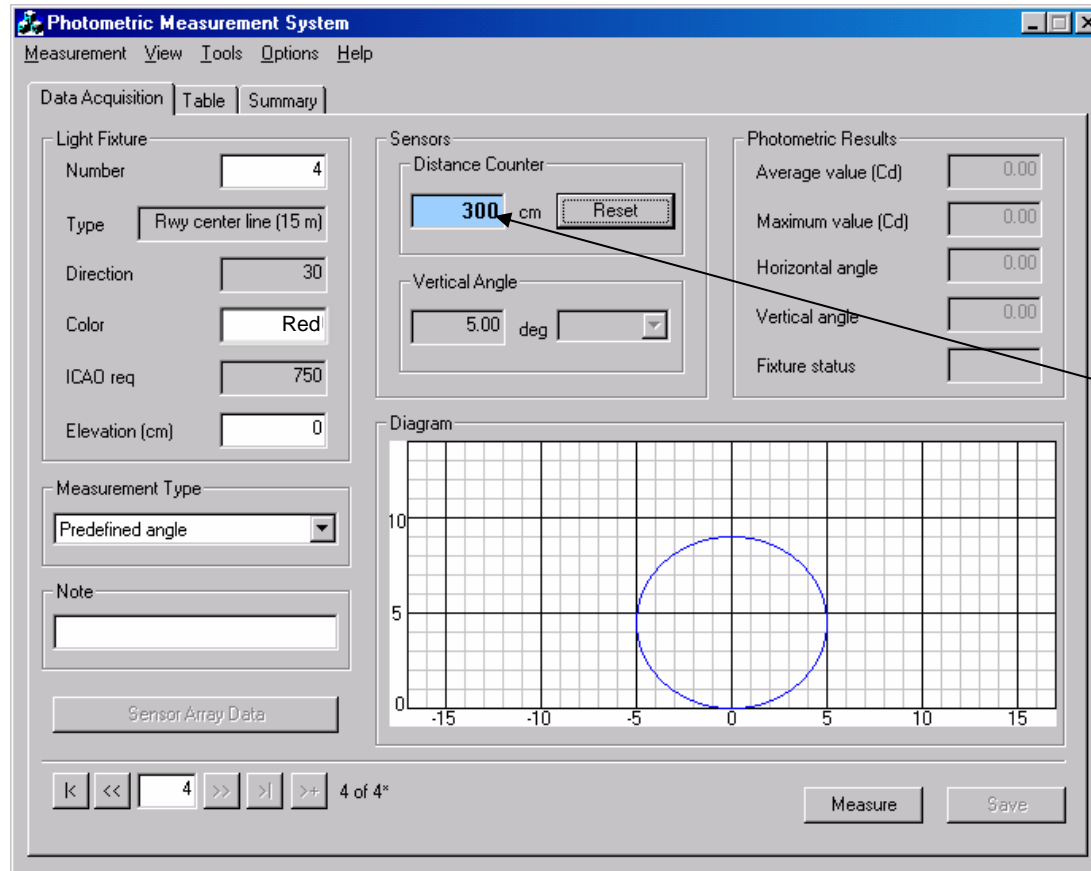




## SMF – The PMS System Software Architecture

- The PMS system software has been designed to operate for Mobile , Lab and Cart operations. It is therefore organised in two different modules:
- Mobile measurement module
- Lab/Cart measurement module with a common data base and analysis procedures module for Lab/Cart/Mobile





**Distance Counter**

Measurement operations of SMF/F are very close to SMF/Lab system ones. The only difference consists in the calculation of the distance between the machine and the fixture, that is performed according to the real position of the cart driven by the operator. In the Lab system the distance is always fixed to the value stated at moment of the installation.

Functions for data analysis and reports are the same for SMF/M, SMF/F and SMF/L

**Photometric Measurement System**

Measurement View Tools Options Help

Data Acquisition Table Summary

Light Fixture:  
 Light ID: 4  
 Type: Rwy center line (15 m)  
 Direction: 24  
 Color: White  
 ICAO req: 2500  
 Elevation (cm): 0

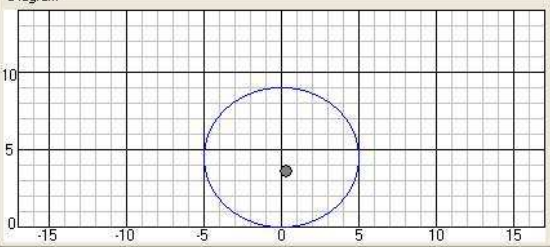
Sensors:  
 Distance Counter: 300 cm [Reset]  
 Vertical Angle: deg

Photometric Results:  
 Average value (Cd): 758.53  
 Maximum value (Cd): 1425.57  
 Horizontal angle: 0.29  
 Vertical angle: 3.68  
 Fixture status: Fail  
 Color Status: Pass

Measurement Type: ICAO grid points

Note: 08 January 2008

Sensor Array Data

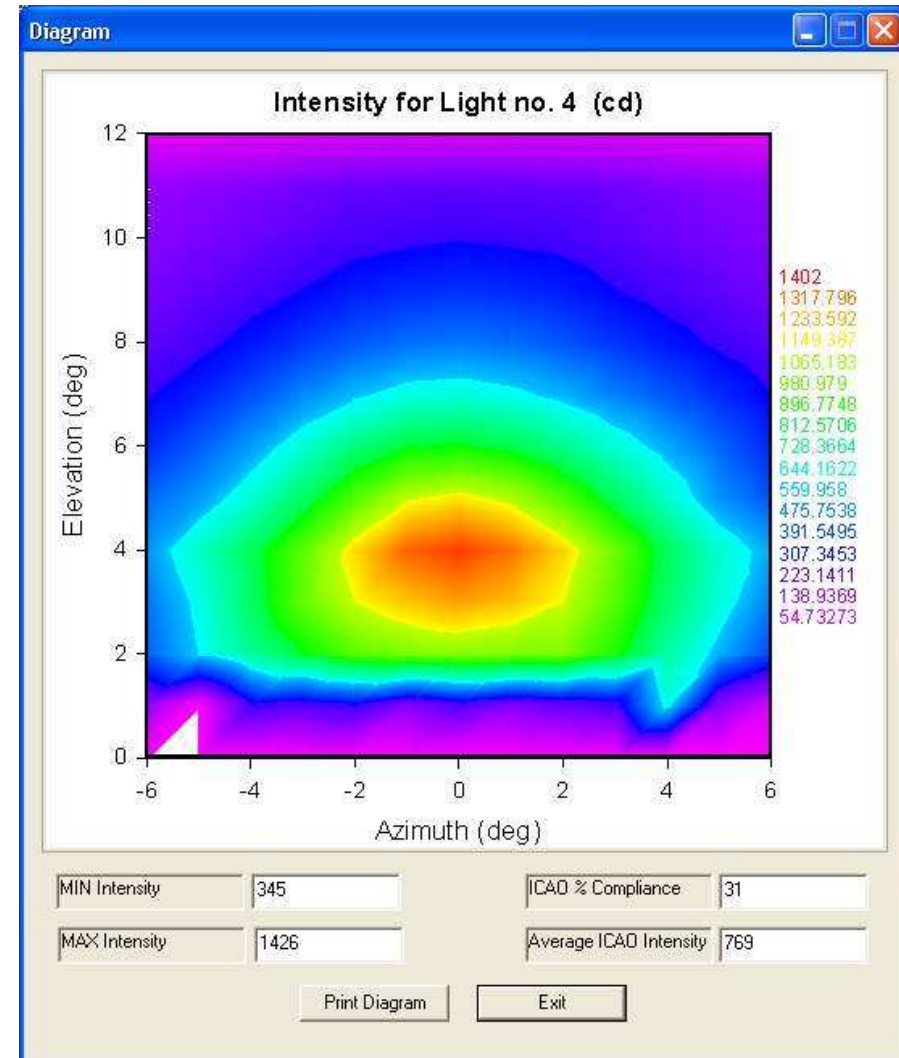
Diagram: 

Error Message: Test failed: mean level of lamp intensity not compliant

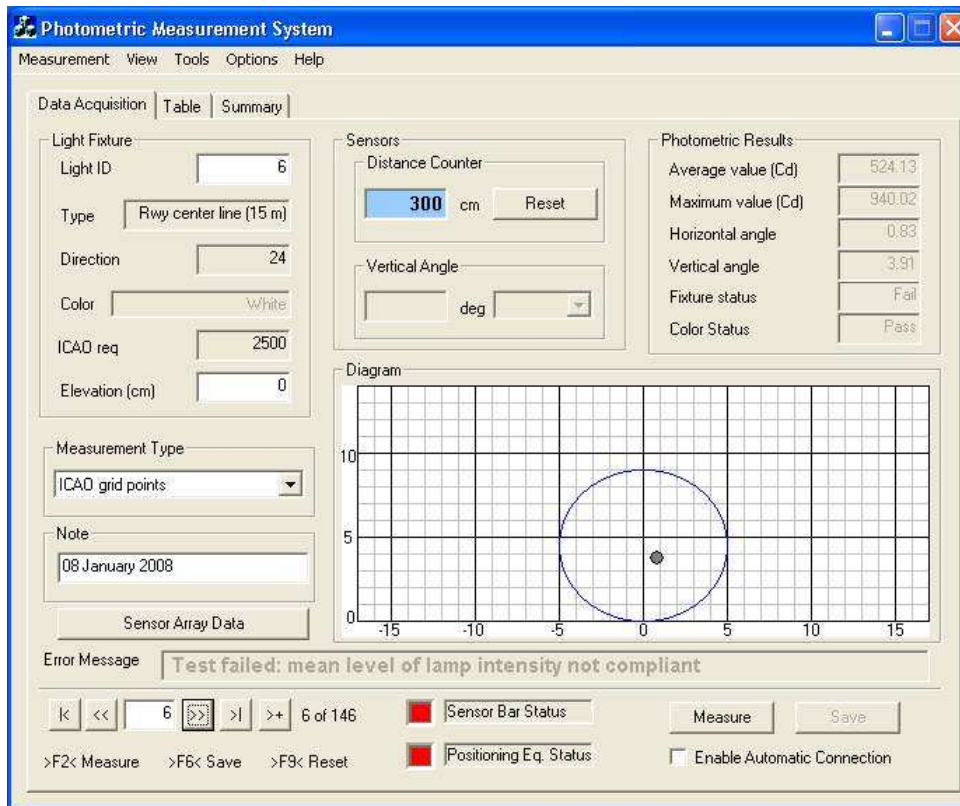
Navigation: [K] << 4 >> [I] >+ 4 of 146

Buttons: Sensor Bar Status, Measure, Save, Positioning Eq. Status, Enable Automatic Connection

Shortcuts: >F2< Measure >F6< Save >F9< Reset



Functions for data analysis and reports are the same for SMF/M, SMF/F and SMF/L



**Photometric Measurement System**  
Measurement View Tools Options Help

Data Acquisition | Table | Summary

Light Fixture:  
Light ID: 6  
Type: Rwy center line (15 m)  
Direction: 24  
Color: White  
ICAO req: 2500  
Elevation (cm): 0

Sensors:  
Distance Counter: 300 cm [Reset]  
Vertical Angle: deg

Photometric Results:  
Average value (Cd): 524.13  
Maximum value (Cd): 940.02  
Horizontal angle: 0.83  
Vertical angle: 3.91  
Fixture status: Fail  
Color Status: Pass

Measurement Type: ICAO grid points

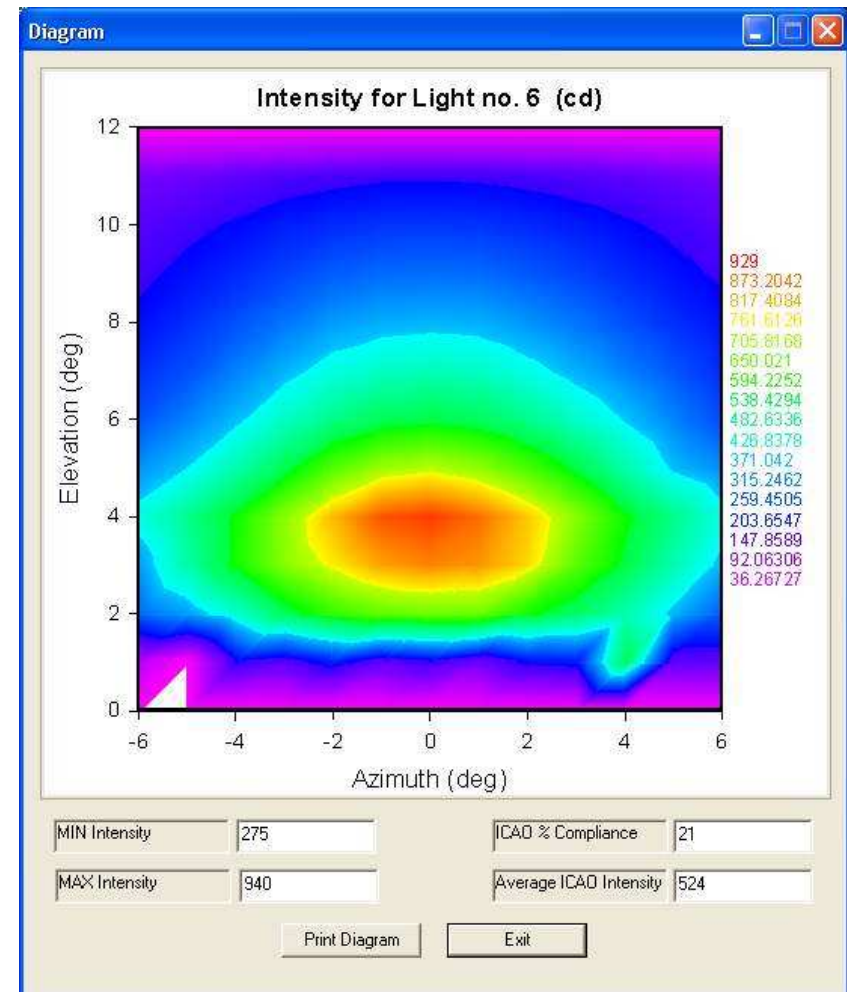
Note: 08 January 2008

Diagram: [Grid with circle and center point]

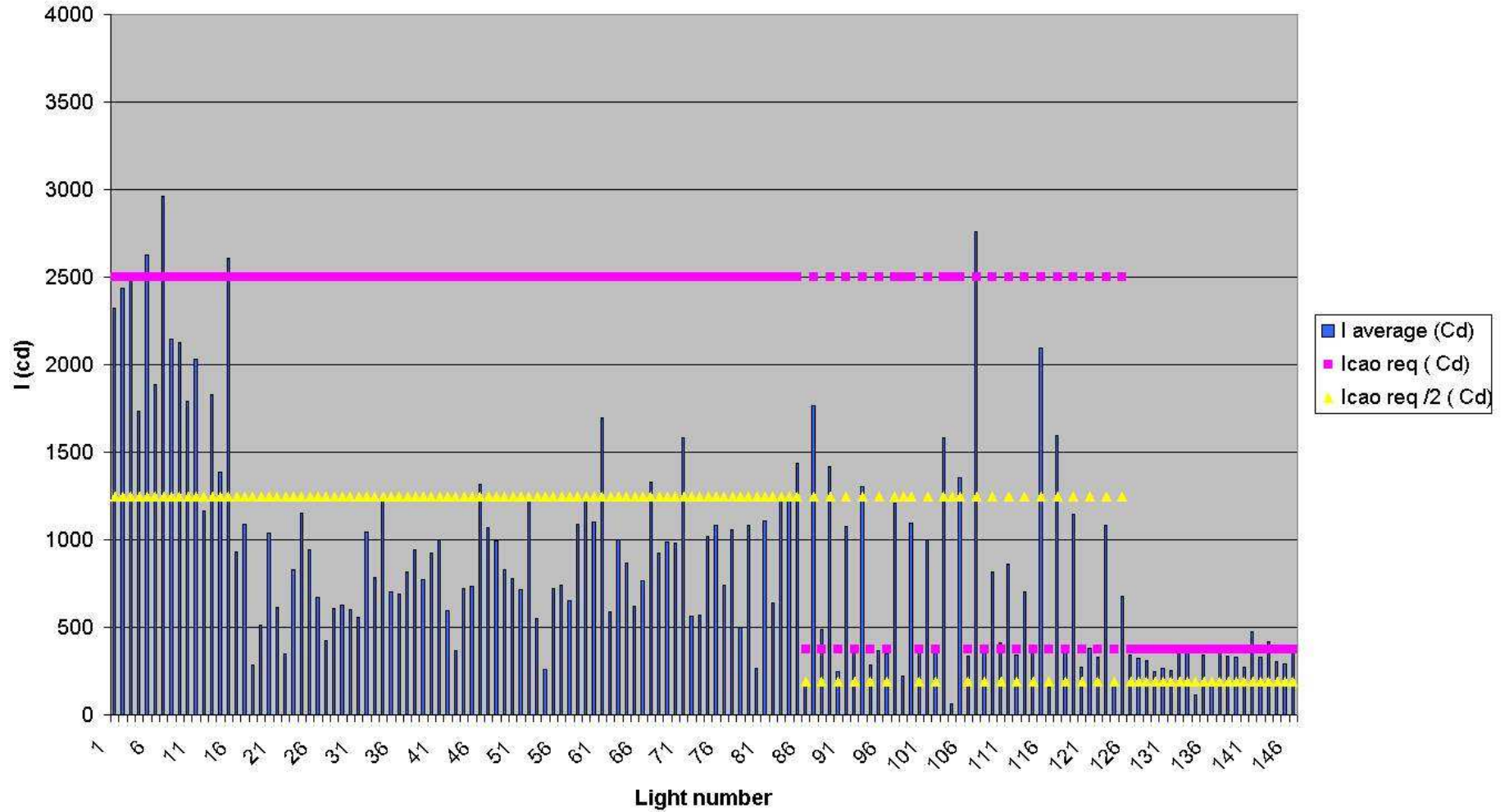
Error Message: **Test failed: mean level of lamp intensity not compliant**

6 of 146 | Sensor Bar Status | Measure | Save | Positioning Eq. Status | Enable Automatic Connection

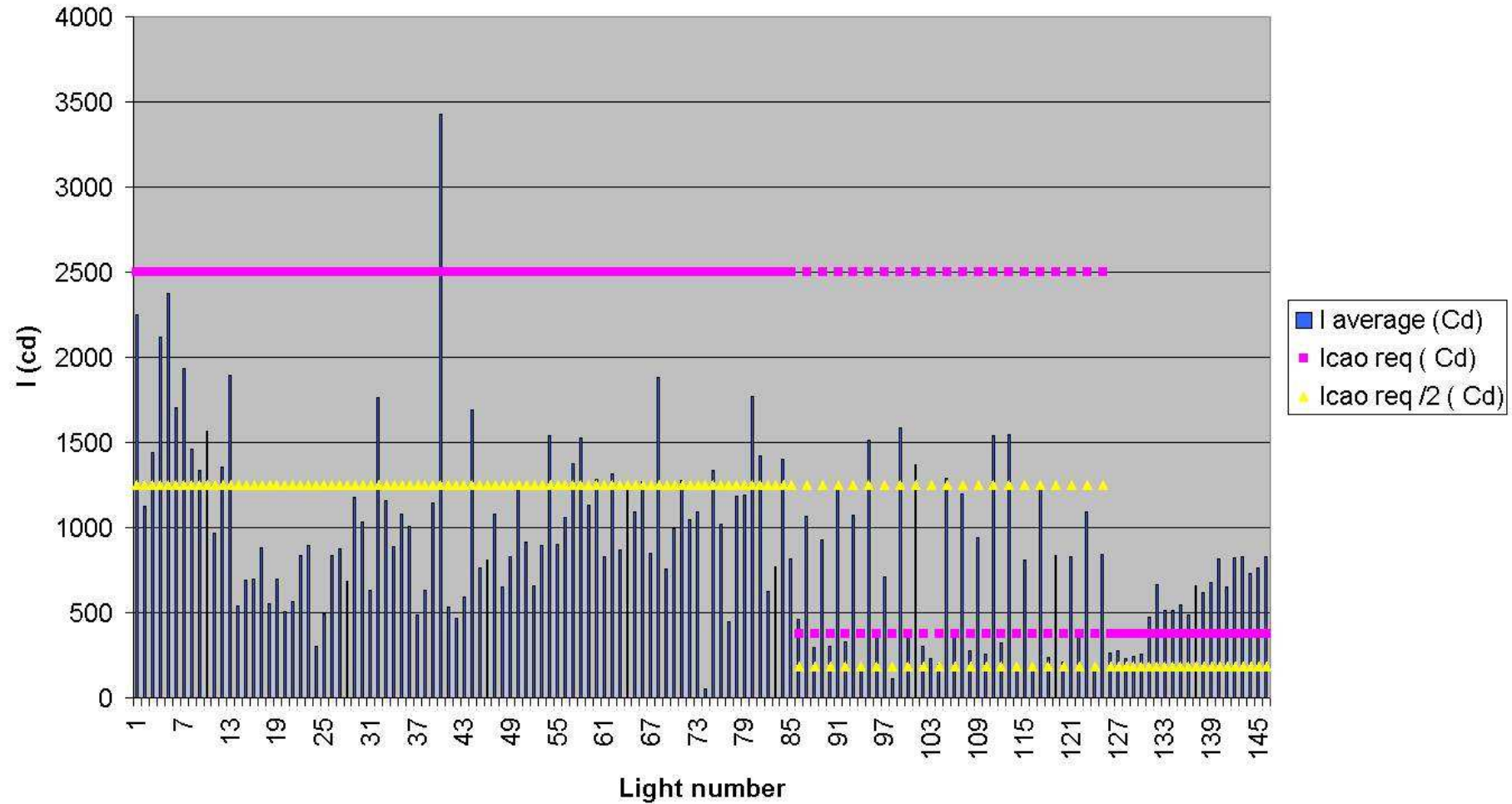
>F2< Measure >F6< Save >F9< Reset



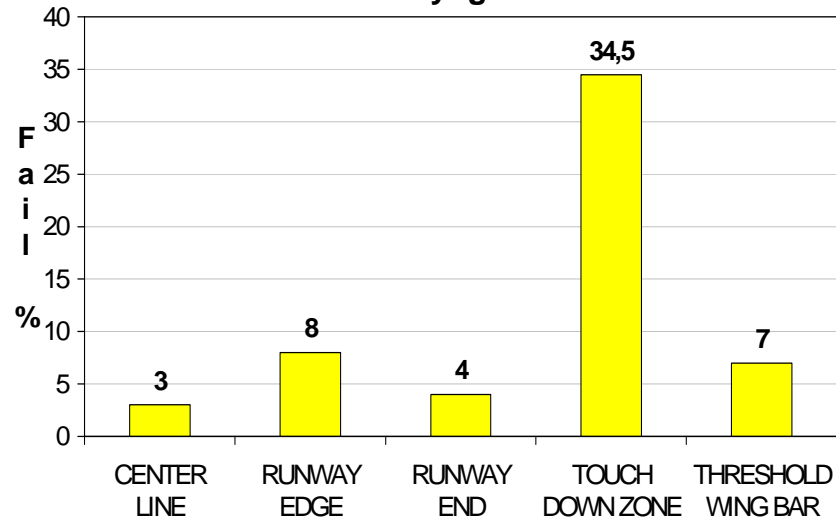
Average Intensity 1st run - dir 06



## Average Intensity @6.6A cleaned - dir 24

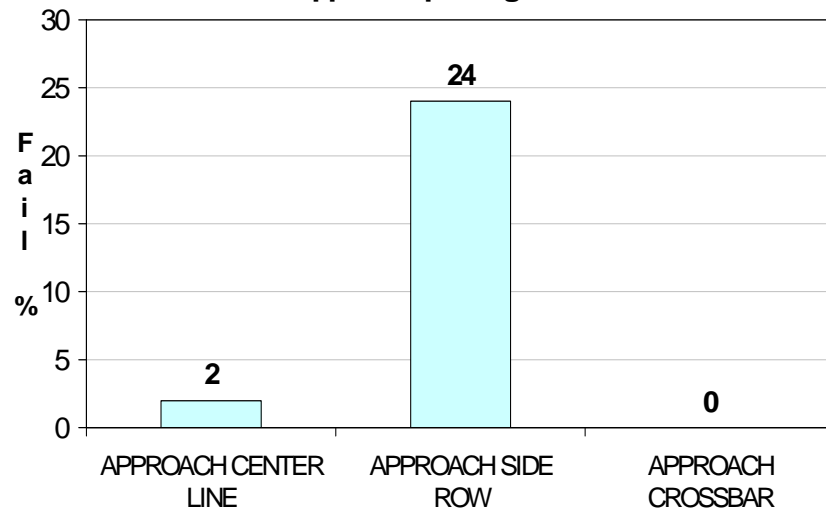


### Runway lights



|             | AVL                     | ICAO REQUIREMENT [cd]         | Fail % |
|-------------|-------------------------|-------------------------------|--------|
| A<br>P<br>P | APPROACH CENTER LINE    | 20000 (W), 5000 (R)           | 2      |
|             | APPROACH SIDE ROW       | 5000                          | 24     |
|             | APPROACH CROSSBAR       | 20000                         | 0      |
| R<br>W<br>Y | CENTER LINE             | 5000 (W), 750 (R)             | 3      |
|             | RUNWAY EDGE             | 10000 (W), 4000 (Y), 2500 (R) | 8      |
|             | RUNWAY END              | 2500                          | 4      |
|             | TOUCH DOWN ZONE         | 5000                          | 34,5   |
|             | THRESHOLD WING BAR      | 10000                         | 7      |
| T<br>W<br>Y | TWY - RWY INT.          | 200                           | 10     |
|             | TAXIWAY                 | 200                           | 8      |
|             | TWY - RWY INT. STOP BAR | 200                           | 8,5    |

### Approach path lights



### Intersections and taxiways lights

