

# NIGHTMET V.2.1

## USER MANUAL

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INFRAMET [www.inframet.com](http://www.inframet.com) [info@inframet.com](mailto:info@inframet.com)

### 2 WHAT IS NIGHTMET

NIGHTMET is an Inframet gift to international community of professionals involved in testing image intensifier tubes and can be downloaded freely from our website: [www.inframet.com](http://www.inframet.com)

This computer program simulates a small part of an image intensifier tube (square 1.25x1.25mm) seen using a microscope during measurement of resolution of an image intensifier tube at different light intensity levels. The user can regulate light intensity that can be changed from very dark night conditions to bright night conditions. Next, the user can change type of simulated image intensifier tube from a list of tubes. We prepared five tubes of different quality (different parameters like resolution, MTF, SNR, MBN). It is possible to carry out comparison of images generated by these tubes and find how the parameters mentioned earlier influence final image quality. In this way Nightmet enables visualization of influence of different parameters of II tubes on final tubes performance.

### 3 INSTALLING NIGHTMET

To install Nightmet application, .NET Framework is required, at least 1.1 version of its redistributable package. Uncompress downloaded installation file and start "Setup.exe" application to run installation setup. Please follow instructions given by installation program to finish installation successfully.

When the installation process finishes, Nightmet icon is accessible from the desktop, so please activate it to start Nightmet.



Figure 1. Nightmet shortcut icon

## 4 USING NIGHTMET

Main window of Nightmet application consists of three parts, starting from the left side: mode and manual buttons, device selection and light regulation panel, and finally the view panel.

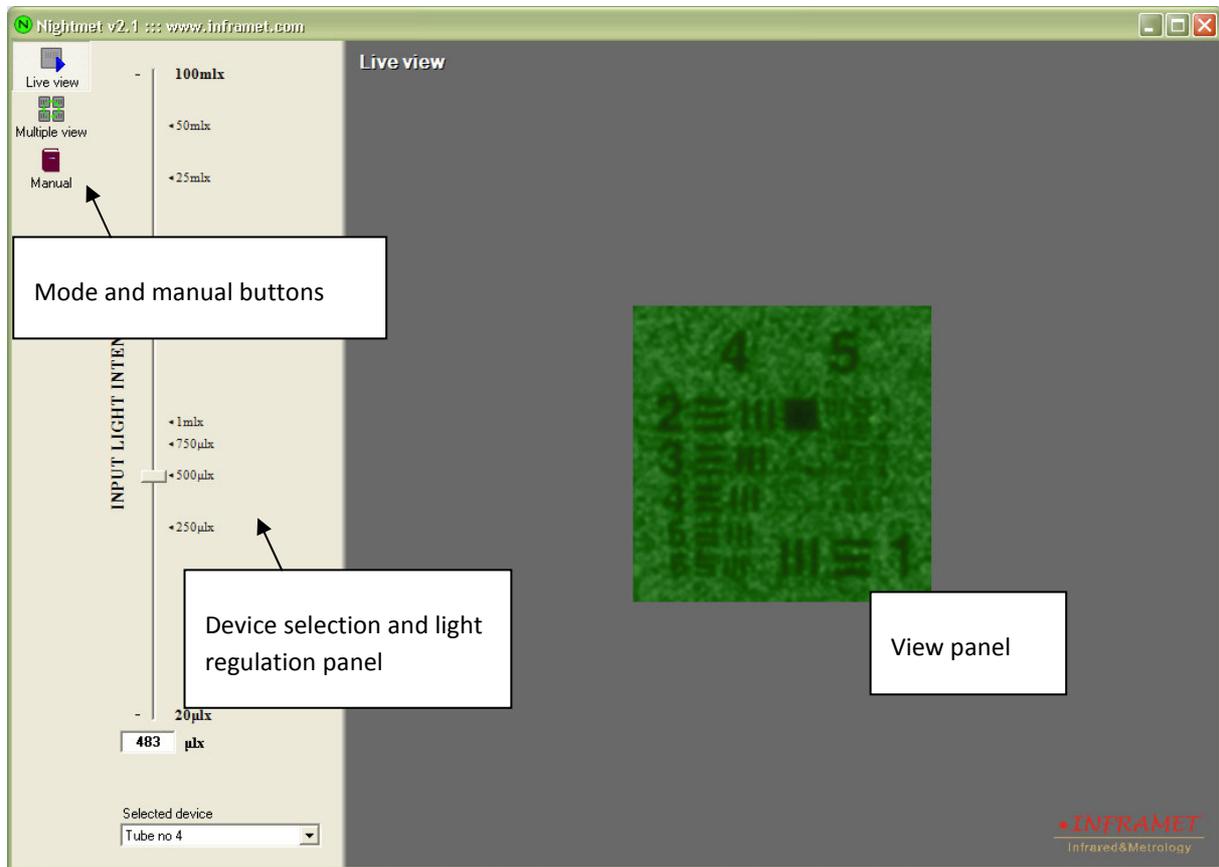


Figure 2. Nightmet main window

As seen on Figure 2, the default view mode, is "Live view". It presents an USAF 1951 target, displayed by a portion of a simulated image intensifier. Later on, using "Live view" or "Multiple view" buttons, it will be possible to switch into one of the available modes.

By clicking "Manual" button, user can view this user manual.

### 4.1 LIVE VIEW MODE

When working in "Live view" mode, user can choose any of the devices available in the "Selected device" combo list (at the bottom of the regulation panel). When choosing another image intensifier, the live preview can blink a little, since the image must be adjusted to the new parameters. The live preview is visible in the main part of the Nightmet window.

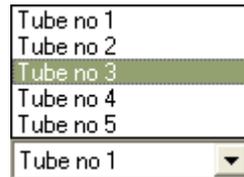


Figure 3. List of available devices and light intensity slider bar

Input light intensity value can be changed in two ways:

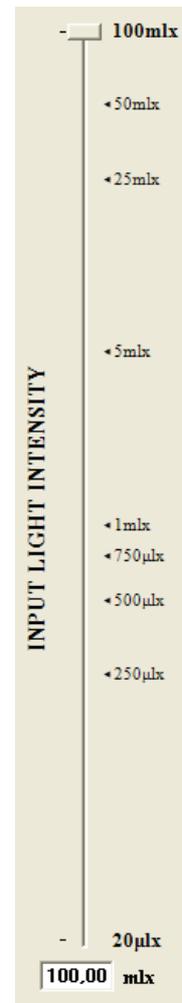
- With a vertical slider bar, which takes most part of regulation panel;
- With input text box, below the slider bar.

When moving the slider block up or down, user lightens or darkens the observed image (according to light intensity scale placed next to the slider), by giving a larger/smaller light intensity level at the input of simulated image intensifier. However it is also possible to change light level, by inserting proper value into a text box. The text field can help a lot to set a very precise light intensity value. Please remember to check the unit next to text box, to be aware of it when inserting new value.

## 4.2 USING MULTIPLE VIEW MODE

In Multiple View mode Nightmet generates video sequences of the same USAF 1951 target at the same light intensity level from four simulated image intensifier tubes. This mode enables easy comparison of quality of images generated by the tubes to be compared.

To enter this mode, please click “Multiple view” button, located on the left side of window. New panel comes in place of live preview, containing four available sub-panels. Each of these sub-panels has a combo list, containing all devices available in “Select device” list, below light intensity slider bar.



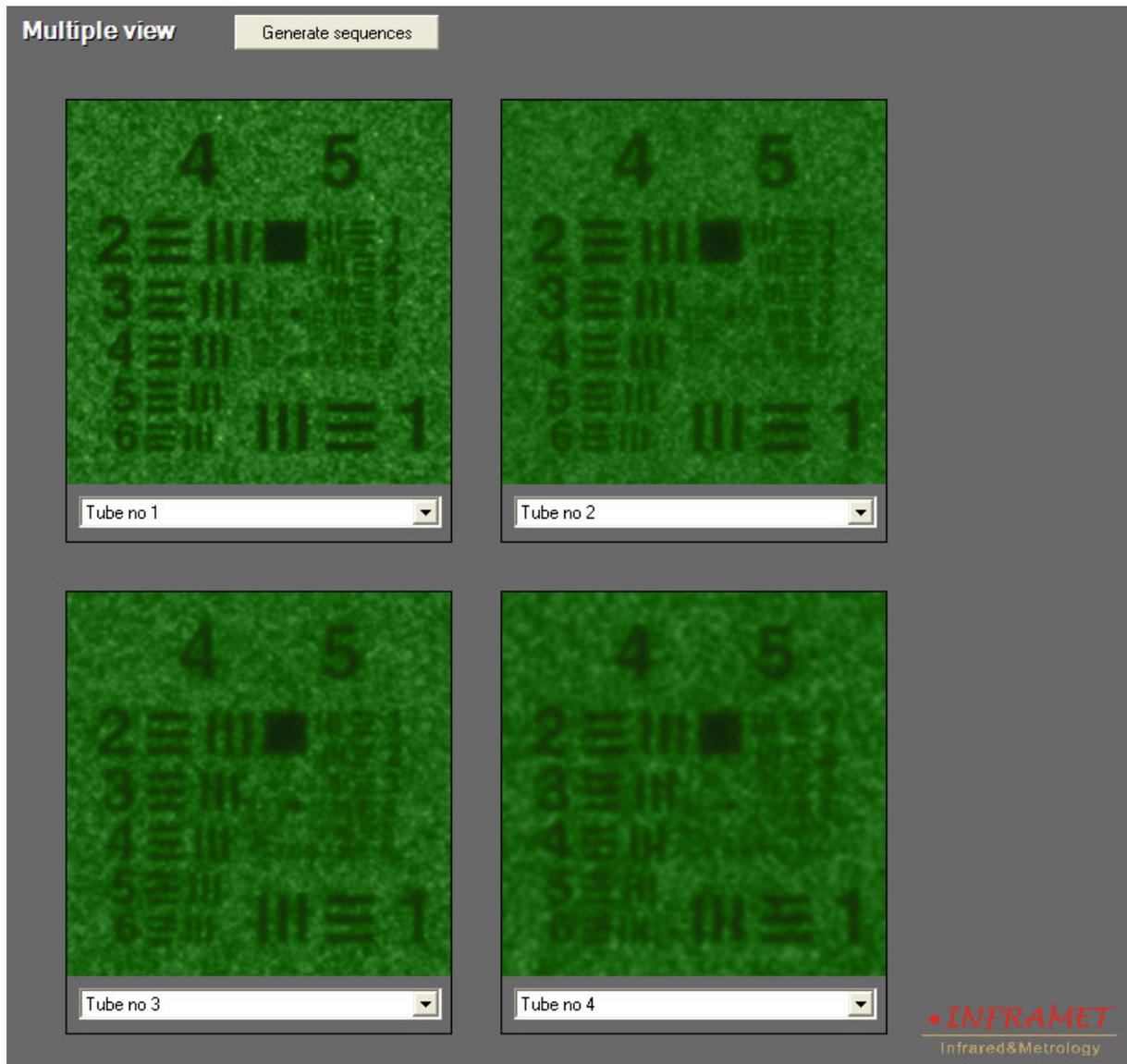


Figure 4. Multiple view panel

“Multiple view” mode therefore, allows user to simulate and compare up to four of available image intensifiers. User just has to pick interesting device names from combo lists in the sub-panels. When it is done, “Generate sequences” button should be pressed and start processing images for each chosen tube.

While the process runs, a progress bar along with short information are displayed above the previews. Most of Nightmet window elements are disabled until all sequences are finished.

After the generation, sequences can be viewed and compared by user, who can also change light intensity value and press “Generate sequences” button again to see how the images shall look like in other conditions.

## Parameters of the simulated image intensifier tubes

	Resolution [lp/mm]	MTF at 30lp/mm	SNR	MBN [%]
Tube no 1	71	0.4	25	3
Tube no 2	71	0.25	25	3
Tube no 3	64	0.25	20	50
Tube no 4	56	0.2	16	7
Tube no 5	44	0.15	14	10

Tube no 1 and tubes no 2 have the same resolution but different MTF at middle frequency range. Please note how this difference in MTF values generates significant difference in image quality generated by these tubes at high light intensity conditions.

Tube no 3 is characterized by lower resolution and lower SNR in comparison to tubes no 1 and no 2. The effect of lower resolution can be noticed at high light intensity conditions (bright night); lower SNR – at low light intensity conditions (dark night) close to 100  $\mu$ lx.

Resolution, MTF and SNR are even more lower than for tube no 3 in case of tube no 4. However, the worst values of the simulated tubes occurs in case of tube no 5.

Tubes no 1 and no 2 are characterized by the lowest MBN (multi boundary noise); tube no 5 – the highest MBN.

We can estimate that the tubes no 1-no 2 and no 3 can be considered as tubes of highest performance, tube no 4 – medium performance; tubes no 5 – low performance.

## 5 SUPPORT

In case of any problems please contact Inframet

tel. +48 604061817

fax +48 22 3987244

email: [support@inframet.com](mailto:support@inframet.com)

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