General information

TV adapters enable video cameras to be connected to Leica DMR/DM L and DM IR/DM IL microscopes. Besides establishing a rigid mechanical connection between the microscope and the camera, the purpose of the adapter is to adapt the microscope image (field of view of the intermediate image plane) to the chip of the CCD camera in use. However, commonly used CCD cameras have extremely different chip sizes, resulting in different photo and picture formats:

Selection of adapters

To guarantee useful TV microprojection in all cases, there is therefore a choice of several TV adapters with different fixed or variable magnification factors. Adapters with 2-stage imaging (parallel light paths) should be used for 3 chip cameras to avoid colour inhomogeneities or ghost images.
From this selection of TV adapters you need to select the adapter according to the situation and your application.
Users usually want to transfer a large proportion of the field of view to the TV screen. This proportion is usually determined by the type of camera used and the magnification factor of the TV adapter, according to the following formula (see Fig. 2):

$$\textbf{Field of view imaged on the screen} = \frac{\textbf{picture diagonal of camera}}{\textbf{magnification factor of TV adapter}}$$

Example for the combination of a 2/3 inch camera with a picture diagonal of 11 mm and TV adapter 0.63x

$$\text{Field of view on screen} = \frac{11}{0.63} = 17.5\text{ mm}$$

To calculate the magnification on the screen, the following factors have to be multiplied:

$$\textbf{Magnification} = \textbf{objective magnification} \times \textbf{tube factor} \times \textbf{TV adapter factor} \times \frac{\textbf{screen diagonal}}{\textbf{camera picture diagonal}}$$

You may also need to incorporate a factor of the magnification changer or zoom system into the calculation for the magnification on the screen.

Types of adapter

As video cameras have different mechanical adapter mounts, there are different adapters for **C-mount, B-mount** or **F-mount** adaption.
C-mount adapters are the most common. Here the camera is adapted via the C-mount thread.
B-mount and F-mount adapters need a special bayonet fitting.

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Assembly of C-mount adapters

First, screw the video camera onto the C-mount adapter. Then, depending on the microscope configuration, both parts are mounted together onto
- the vertical photo port of the HC FSA tube
- one of the two exits of the photo port HC 100/100
- to the TV port of the DM RD
- to the side TV port of the DM IR

and fixed with the clamp screw at the side.

Assembly of B- and F-mount adapters

First, put the camera on the B- or F-mount adapter onto the bayonet fitting and then fix to the microscope as described above for the C-mount adapter.

Assembly of adapters for 2-stage imaging

With these systems, the basic adapter 0.5x first has to be screwed together with one of the chosen secondary adapters. The further procedure is the same as for the simple adapters.

Fig. 1: Video cameras and picture formats

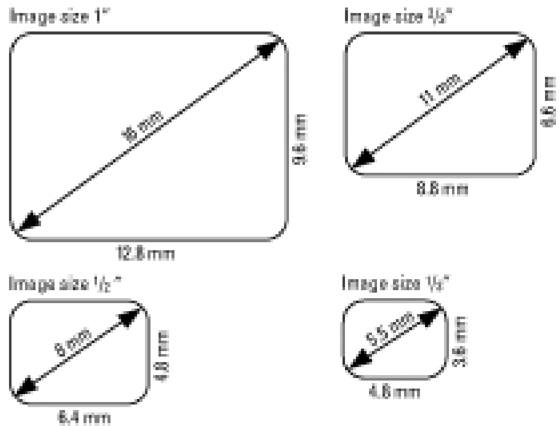

Fig. 2: Monitor field of view depending on TV adapter and image size

Factor TV adapter	Image size 1"	Image size 2/3"	Image size 1/2"	Image size 1/3"
0.35x	45.7	31.4	22.9	17.1
0.4 x	40	27.5	20	15
0.5 x	32	22	16	12
0.7 x	29.	20	14.5	10.9
0.63x	25.4	17.5	12.7	9.5
0.8 x	20	13.75	10	7.5
1 x	16	11	8	6
1.1 x	14.5	10	7.3	5.5

☐ recommended combination
▒ theoretical combination (not allowed)