Merging with PIX Connect software

The PIX Connect software includes an important function which is the so-called merging. The merging allows the user to display several cameras in one software instance. This is very helpful when a whole process where several cameras are installed must be monitored in only one screen. It is important to use only cameras with the same adjusted frame rate.

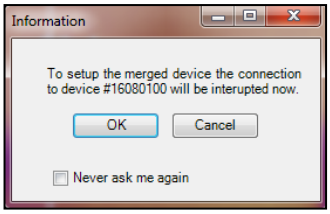
Advantages of camera merging

- If pixel size is getting too big, the use of multiple imagers is possible
- Simultaneous flag control and frame synchronization via PIF
- Measurement areas / hot-, coldspots operate for the whole merged IR imager
- Different camera positions allow having various viewing angles for a complete view of a 3D object
- After merging setup and restart of the PIX Connect software the source instances will open automatically

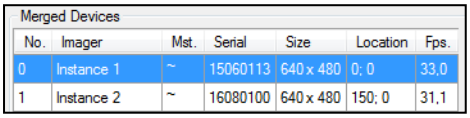
Generally, there are two ways to realize a merging. On the one hand you can connect the cameras directly to your computer **via USB Port** (for 2 or 3 cameras recommended) and on the other hand **via an Ethernet network** (recommended for more than 3 cameras). Using the direct connection, it is important to have several USB controllers at your PC. You find this information under the **Windows control panel**, **Device Manager** and **USB controller**. One imager should be connected to one USB controller.

Merging setup under PIX Connect

1. Open the PIX Connect Software having connected all the cameras.
2. Go to **Tools** and **Merger settings**. A message will show up that the device will be interrupted. Press OK and the **Config merged device** window will open.



3. Click on **Add** for the number of cameras you want to use for the merging. Note: Instance No. 0 is the **master** instance and the other instances are the **slave** instances (No. 1, No. 2 …).



4. To start the individual instances, select each single instance one after another and press the **Start** button. All windows will open for the different instances. Alternatively, you can start all instances at the same time by pressing the button **Start all**.
5. Go to each Instance window and select under menu **Devices** the camera that you want to use and under **Tools**, **Configuration**, **Device** and **Application Start** assign each camera to an instance.
6. There are two possibilities to configure the layout of the whole picture:
    a. Go to the **Config merged device** and select the instances one by one and click on **Edit Source imager**. The **Imager Config** window will open and here you can define the **Position** of the instance in the merged image. It is recommended to do a small overlapping of the images (up to 5 pixels) in order to have a smooth transition between the images. Repeat that for all instances.
    b. You also can change the position, size and rotation of the different instances windows directly in the **Config merged device** window (starting from PIX Connect software version 2.15.2222.0).
7. Press **OK** and you're finished with the general set up and receive a merged picture (merger instance) in the main window. It is important to run the source instances in the background. They can also run in hidden mode (see **Config merged imager**). Also, the instance of the merged device must be located on the primary monitor.

Optris GmbH
Ferdinand-Buisson-Str. 14
13127 Berlin
Germany
Tel. +49 (0)30 500 197-0
Fax +49 (0)30 500 197-10
info@optris.global
www.optris.global

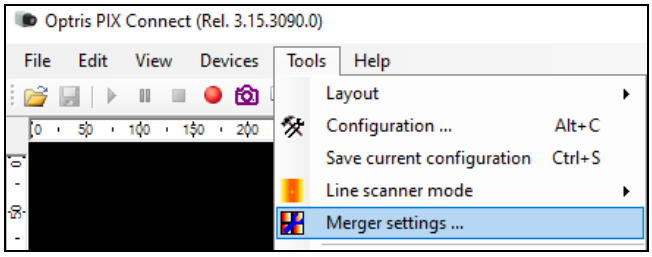


Figure 1: Merging set up with PIX Connect software (1. & 2.)

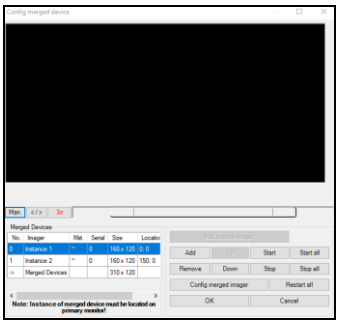


Figure 2: Config merged device – Adding and starting instances (3. & 4.)

Figure 3: Master and slave instances (4.)

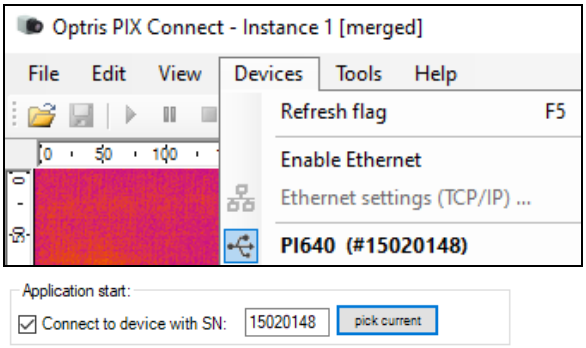


Figure 4: Assign a dedicated camera to an instance (5.)

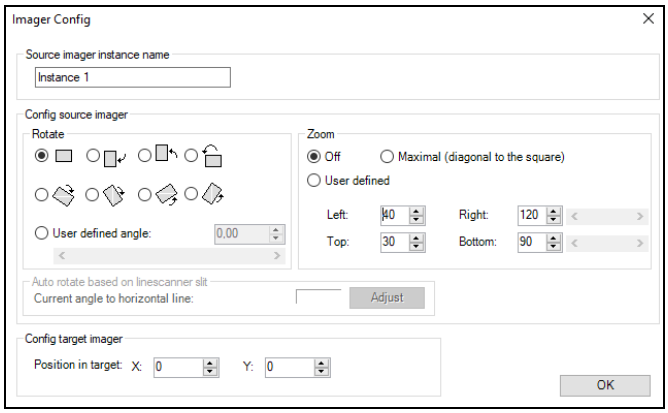


Figure 5: Configuration of the merged image (6a.)

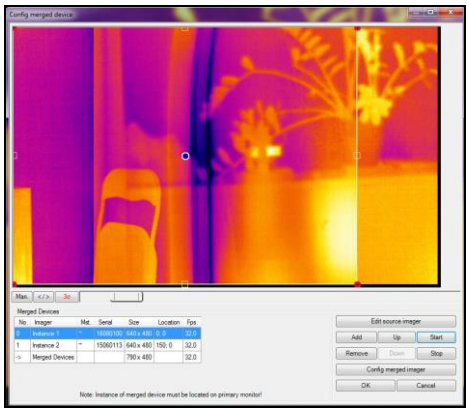


Figure 6: Manual size arrangement (6b.)

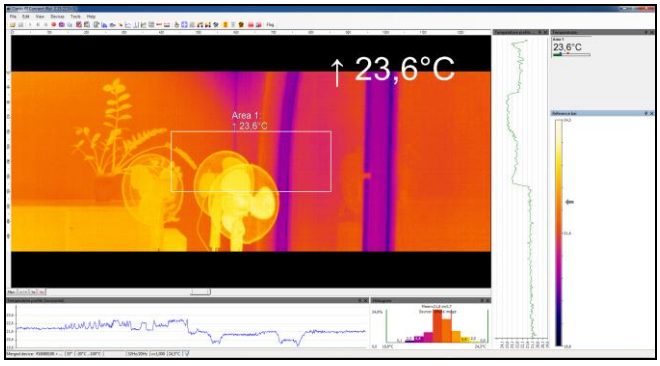


Figure 7: Final merging picture, merger instance (7.)

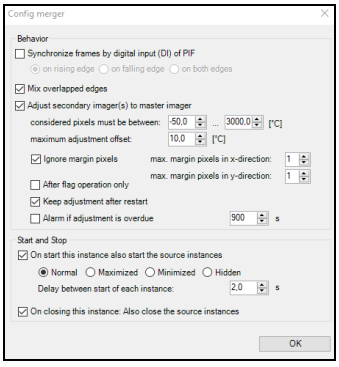


Figure 8: Config merged imager (7.)

A detailed description for the entire setup is explained in the PIX Connect software manual.

Optris GmbH
Ferdinand-Buisson-Str. 14
13127 Berlin
Germany
Tel. +49 (0)30 500 197-0
Fax +49 (0)30 500 197-10
info@optris.global
www.optris.global

Connection via the Ethernet network

The setup for the merging is realized via the Ethernet network. Therefore, the cameras are connected to the **USB Server Gigabit** and those in turn are each plugged to an **Ethernet PoE switch**. At last, you have the connection from the switch to your PC (see **Figure 9**). For the Xi 80 camera you can have a direct Ethernet connection by using the PoE adapter (**Part-No.: ACXIETPOECBx**).

Hardware & Software Recommendation:

- Computer (e.g. Intel Core i7-6700HQ, 16GB RAM, 256GB SSD) with OS Windows 10 or higher
- Optris PI/Xi camera and PIX Connect software version 2.15.2219.0 or higher
- Mandatory the use of the USB Server Gigabit (**Part No.: ACPIUSBSGB**). The use of another USB server is not supported and might not work properly**!**
- Managed Gigabit Ethernet PoE switch (Recommendation: Netgear **GS510TLP**)

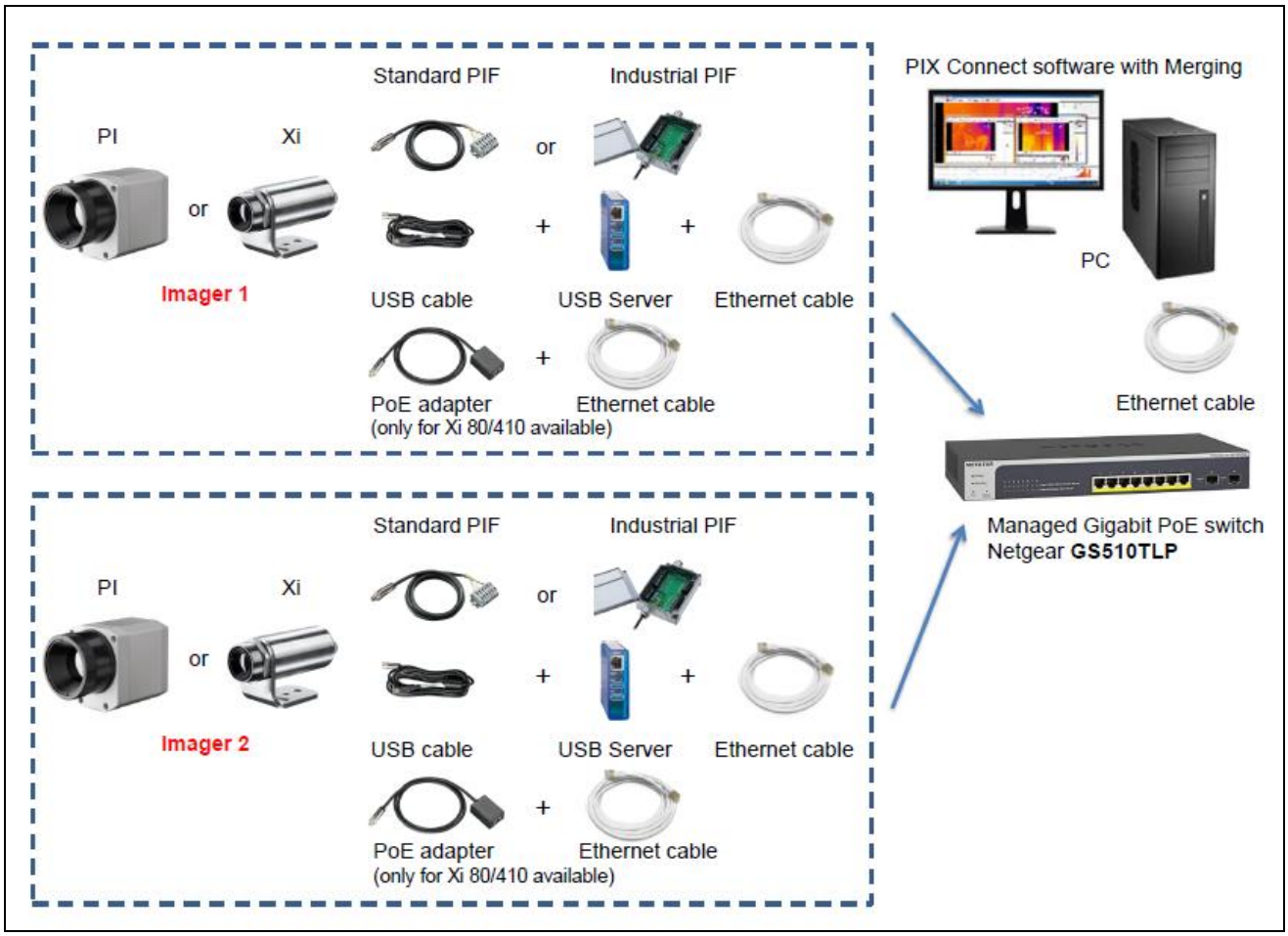


Figure 9: Connection of 2 cameras via Ethernet network

- Merging is not supported for PI 1M/ 08M/ 05M cameras.
- Xi 80 has a direct Ethernet connection which can be used in combination with the PoE adapter.
- The total amount of cameras that can be used for merging is highly dependent on the type of cameras that are used and on the performance of the PC.

Optris GmbH
Ferdinand-Buisson-Str. 14
13127 Berlin
Germany
Tel. +49 (0)30 500 197-0
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info@optris.global
www.optris.global

Flag synchronization

In Merging mode, it is important for the synchronization of the image that the **flag** of the cameras used, is drawn at the same time. This function is already set automatically. For older software versions, you still need to configure these settings (under **Tools**, **Configuration** and **Device** (see **Figure 10**)). No additional hardware, such as the Process Interface (PIF), is required. The flag automatic must be activated for the Merger instance and deactivated for the master and slave instances (see **Table 1**).

	Flag automatic
Merger Instance	On
Master Instance	Off
Slave Instance(s)	Off

Table 1: PIX Connect settings for flag automatic

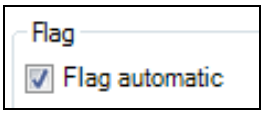

Figure 10: Flag automatic activated for merger instance

Simultaneous frame synchronization via PIF

For simultaneous frame synchronization, use the PIF connection from the camera. You can choose between the standard PIF and the industrial PIF depending on how many in- and outputs you want to use. In our example, the standard PIF is used. One camera will be chosen as the **master** and the others are the **slaves**. Please connect the digital input with the analog output of the master PIF and from the analog output you connect all digital inputs of the slaves together like shown in **Figure 11**.

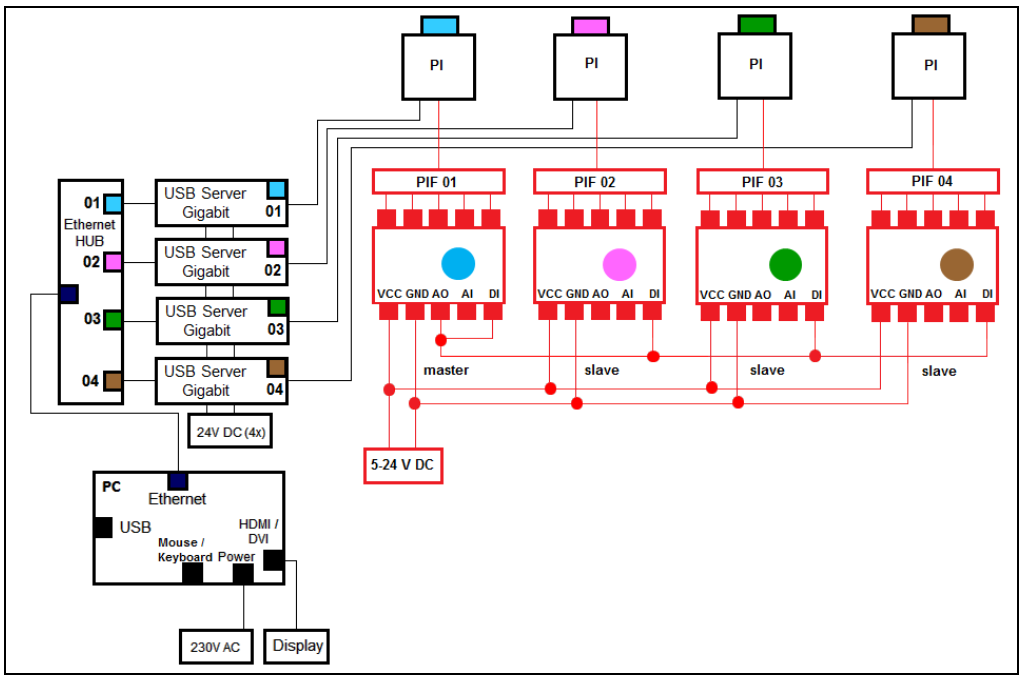

Figure 11: Using the PIF connection for simultaneous frame synchronization

After finishing the hardware installation, you must set up the configuration in the PIX Connect software. Therefore, go to menu **Tools**, **Extended** and **Config merged device**. Then click on **Config merged imager** and enable **Synchronize frames by digital input (DI) of PIF** (see **Figure 12**).

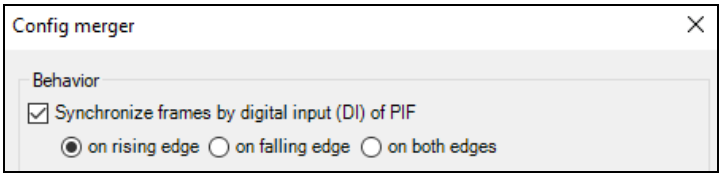

Figure 12: Config merged imager

Optris GmbH
Ferdinand-Buisson-Str. 14
13127 Berlin
Germany
Tel. +49 (0)30 500 197-0
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info@optris.global
www.optris.global