STEMMER IMAGING

Application Note

Master-/Slave Configuration Siso Marathon Framegrabber

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This document describes the configuration of a master- / slave framegrabber setup with two or three framegrabbers. The idea is that one framegrabber (master) handles the synchronization of all other framegrabbers (slaves). The advantage of this setup is that there is no need for an external frequency generator.

Copyright

Content

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Master- / Slave Configuration

Hardware

- 2-3 Siso Framegrabber
  - This configuration works with all Framegrabbers of the Ironman or Marathon series.
- Master - / Slave ribbon cable
  - [#32920] SISO ME-M/S-TRIGGER-CABLE-3-1-R (three framegrabbers)
  - [#32970] SISO ME-M/S-TRIGGER-CABLE-2-1-R (two framegrabbers)

SISO ME-M/S-TRIGGER-CABLE plan

This cable plan shows the possibilities of the master- / slave ribbon cable. Typically only connection 1 is used for the synchronization but also other configurations are possible.

Connection	SISO I/O	Master (FG 0)	Slave1 (FG 1)	Slave 2 (FG 2)
1	Output 0	Output 0	Input 1	Input 1
2	Output 1	Output 1	Input 2	Input 2
3	Output 2	-	Output 0	-
4	Output 3	-	Output 1	-
5	Input 0	Input 0	Input 0	Input 0
6	Input 1	Input 1	-	-
7	Output 4	-	-	Output 0
8	Output 5	-	-	Output 1

Only Port A of the SISO I/O board is used. All GNDs are passed through.

For more information about used pins, please refer to the Silicon Software documentation.

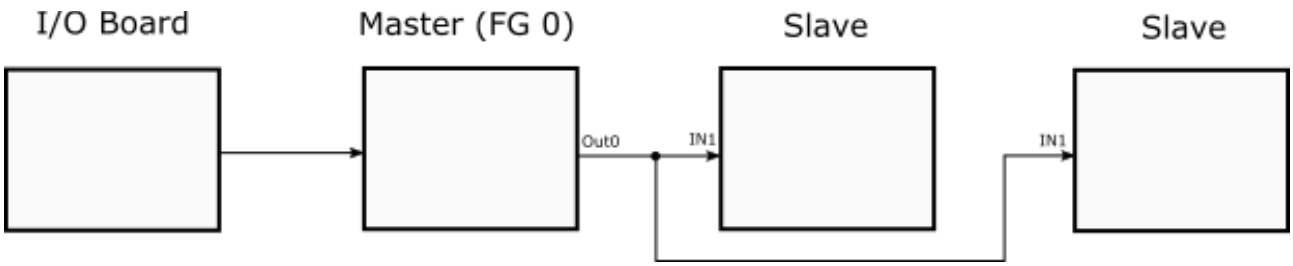
Master- / Slave Configuration

Theory of operation

As in most master- / slave configurations, the aim is to use one master framegrabber to synchronize all cameras on all framegrabbers. The source of the trigger signal can be an internal generated signal on the master board or an external signal. The master processes this signal and sends it to all of its cameras but also to the slave boards using an output. It is important that only the master framegrabber has to be configured to control framerates or to start / stop the application.

As the cable plan makes clear that the master board always has to be the board next to the I/O Board. If the board order (FG 0, 1…) does not fit it is possible to change the order by software to ease the configuration.

In our case, the master sends a sync signal to both slaves simultaneously. Of course, it would also be possible to use Daisy Chain but this is not possible with the ME-M/S-TRIGGER-CABLE.



All necessary features of the framegrabber will be explained in the following chapter.

Master- / Slave Configuration

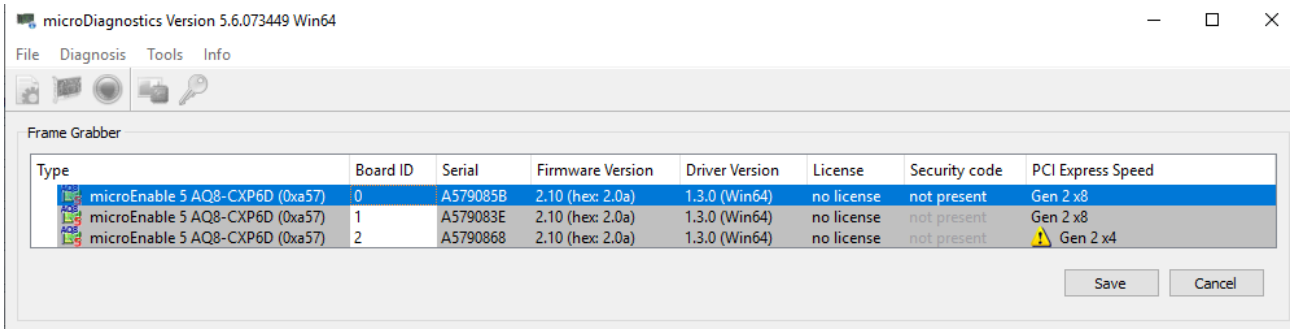
Configuration

The master will generate a signal which will be used to synchronize all cameras. For this configuration no external signal is necessary. The framerate and the start- / stop of the application will be completely controlled by the master.

The following example refers to a CXP system with 4 cameras on each framegrabber.

Board order

Before starting the configuration check the board order and make sure that the master Framegrabber has the board. No. 0. This way it is easier to track changes.
If the board order is not correct you can use the microDiagnostic tool to change the order.



Master- / Slave Configuration

Master Framegrabber

Camera 0 (Master)

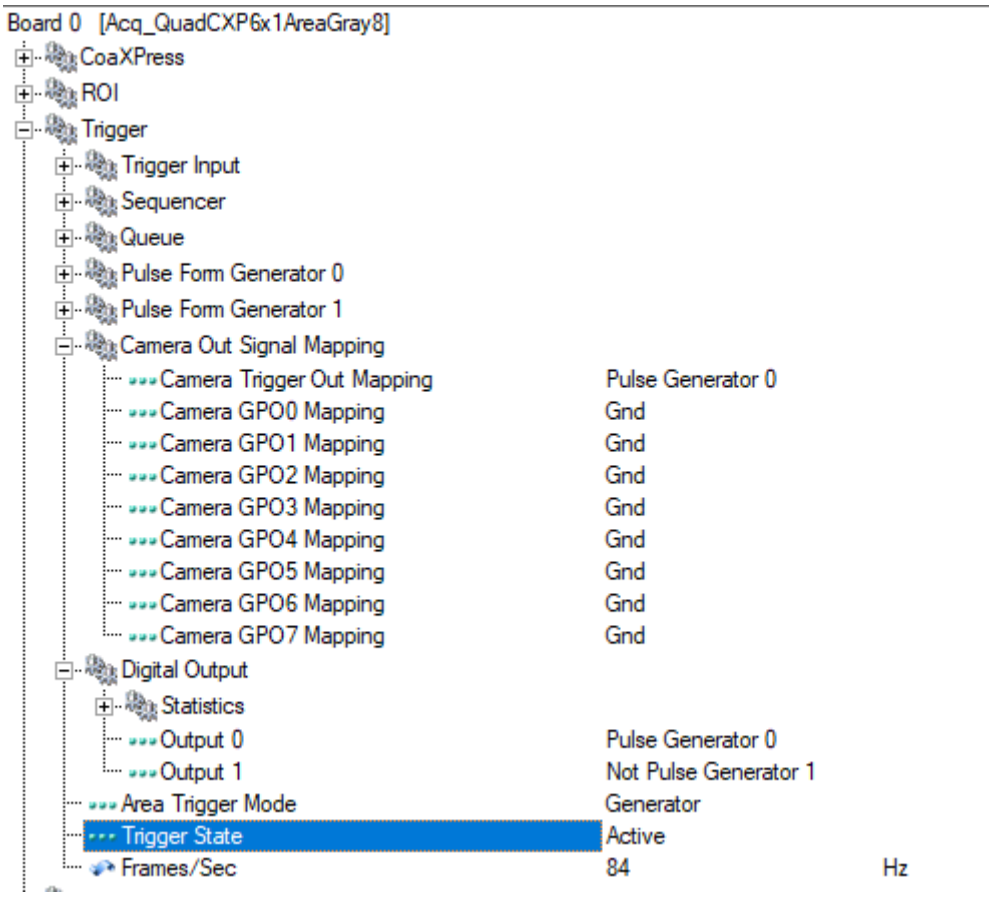
This camera is the real master of the setup. The "*Area Trigger Mode*" is set to "*Generator*" which configures the "*Camera Trigger Out Mapping*" to "*Pulse Generator 0*" (PG0). PG0 will now generate a signal, which can be send to the other cameras on this grabber and to other framegrabbers. Therefore "*Output 0*" has to be set to "*Pulse Generator 0*". It is also possible to configure pulse width and delay of PG0.

Frames/Sec

This feature allows controlling the current framerate.

Trigger State

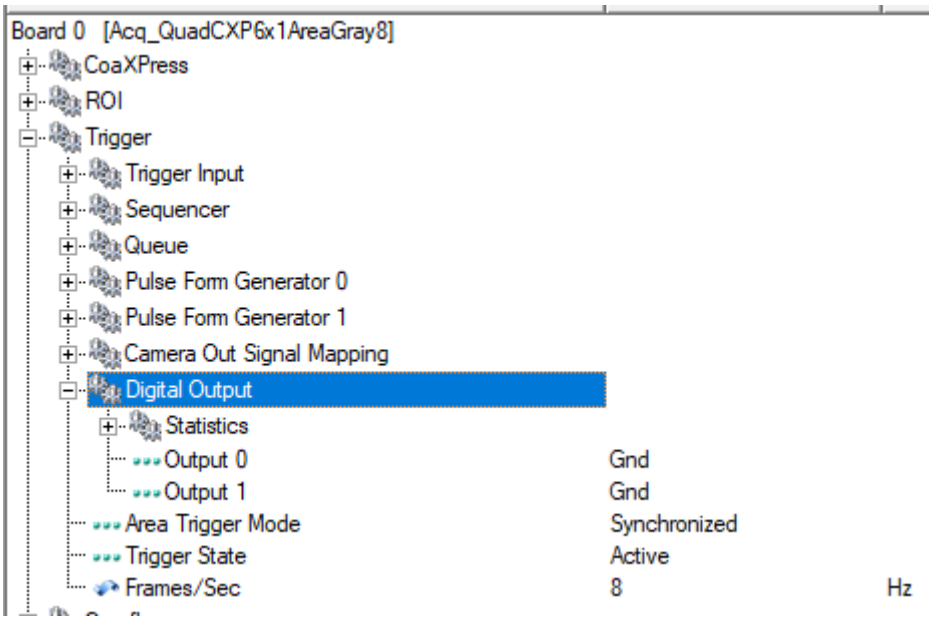
For synchronized acquisition, this parameter is essential. It has to be set to "*Sync Stop*" or "*Active*" regarding of the current state of acquisition.



Master- / Slave Configuration

Camera 1-3

These cameras are slaves although they are connected to the master. The “Area Trigger Mode” is set to “Synchronized” and therefore the cameras will be triggered simultaneously to camera 0.



Also

- “*Output 0*” should be set to *Gnd*,
- “*Trigger State*” always to *Active*
- and “*Frame/Sec*” to the maximum framerate.

The settings for the slave cameras will be constant.

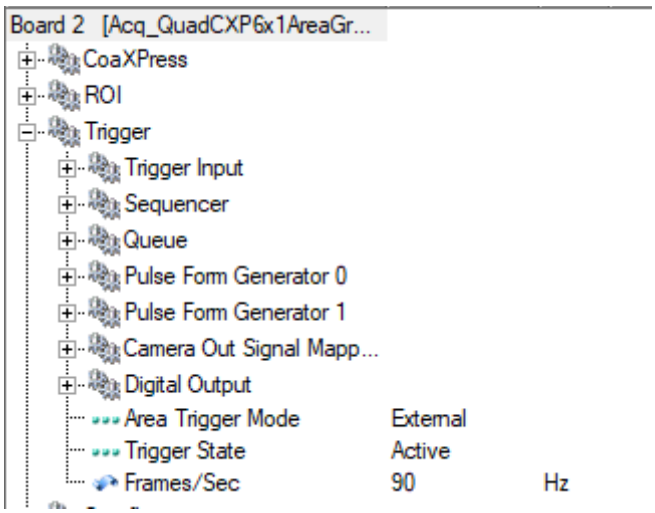
Master- / Slave Configuration

Slave Framegrabber

Camera 0

Using the ME-M/S-TRIGGER-CABLE the output 0 from the master is connected to input 1 of the slave Framegrabber. This input will be used to trigger the cameras. Therefore

- *"Trigger In Source" set to* "*Trigger Source 1*"
- "Area Trigger Mode" set to "*External*".
- "*Trigger State*" set to *"Active*".
- "*Frames / Sec"* set to maximum Framerate.



Camera 1-3

Refer to *Chapter 4.2.1.*

Configuration files

Save the configuration of the master and slave Framegrabber into two different configuration files (Master.mcf; Slave.mcf). Those file will be loaded to the correct framegrabbers at program start. If you have two slave Framegrabber the Slave.mcf is valid for both.

Master- / Slave Configuration

Start Acquisition

If everything is configured correctly, starting the application is possible in the following order.

- Make sure the trigger state of the master camera is set to “Sync Stop”.
- Setup the necessary framerate in “*Frames/Sec”* of the master camera.
- Start acquisition of all cameras.
- Set trigger state of the master camera to “*Active*”

Before stopping the acquisition, the trigger state of the master camera should be set to “*Sync Stop*”. This way all cameras should have acquired an identical number of frames.