AFBR-S50 series
Time-of-Flight sensor modules for distance and motion measurement

Release Notes

Argus Productive SDK
Release V1.2.3
November 19th, 2020

The SDK Release V1.2.3 is a Productive Software Release, which shall be used together with AFBR-S50 TOF modules. All Hardware revisions to date (both V1.1 as well as V1.2 devices) are supported.

The Software supports the following AFBR-S50 variants:

AFBR-S50MV85G (medium range, typical up to 10 m, 7… 16 Pixels illuminated), productive

AFBR-S50MV85I (short to medium range, typical up to 5 m, 32 Pixels illuminated), productive

AFBR-S50MV68B (medium range, typical up to 10 m, 1 … 2 Pixel illuminated), productive

AFBR-S50LV85D (long range, typical up to 30 m, 1 … 3 Pixel illuminated), productive

Important remark:

With the basic SDK version, no direct register access is possible and any violations of laser class 1 eye safety limits are blocked.

1. Feature enhancements from previous release 1.1.5:

Id	Feature	Description	Application Note
1	Shotnoise Monitoring	The Software includes the possibility to use non-illuminated pixels to monitor the actual shotnoise caused by ambient light. This is being used to adapt the sensor settings for optimum sensitivity and precision under different ambient light conditions.	For modules AFBR-S50MV85G, -S50LV85D and –MV68B the shotnoise monitoring is enabled by default (mode “Dynamic”). For AFBR-S50MV85I shotnoise monitoring is disabled since all pixels are illuminated actively. In this case, the mode “Static Indoor” or “Static Outdoor” must be selected manually. In unknown or varying environments, “Static Outdoor” is recommended.
2	Pixel to Pixel offset calibration	The Software includes a compensation of individual Pixel distance errors to a binned average value and means of calibration.	Pixel to Pixel offset calibration is recommended for precise gesturing applications such as face tracking. It also includes calibration of the Reference Pixel.
3	Increased Peak Power in Longrange Mode	For Long Range Mode the maximum peak power is increased by 20% and the burst patterns are shortened by 20% to have the same eye safety levels.	This change increases the expected usable range by approx. 10% in Long Range Mode for all module types.
4	Dynamic PLL calibration	A dynamic PLL calibration and adaption is implemented, compared to the static calibration of SW 1.1.5. This allows for automatic adaption to optimum settings during operation.	The dynamic calibration is based on an early loss of lock indication and does not require additional measurement time. No user interaction is required.
5	Hardware based frequency drift compensation	Frequency drift over temperature is compensated in Hardware with 0.1% granularity. The remaining error is corrected in Software.	In previous releases the drift has been compensated in Software only.

2. Fixes for issues of previous release 1.1.5:

Id	Issue	Description	Fix
1	Measurement errors at short distances and bright objects	The previous Software reported too large ranges in case of a bright object and short distances (e.g. <15cm in front of a white wall, or retro reflector)	Updated configurations, optimized pixel saturation detection, optimized laser offset compensation, improved laser biasing
2	DFM window errors for >25m in SR mode, >50 in LR mode	DFM mode had a prediction weakness for the second half of the increased unambiguous range	DFM window detection fixed. Now the complete enhanced unambiguous range is usable, as long as signal strength allows.
3	DFM prediction errors in noisy environment	DFM window has been sporadically predicted wrongly in environments with strong ambient light and low signal strength.	Added a DFM signal quality filter, which marks the status of frames as invalid, in case window selection is too close to the decision limit.
4	Reference Pixel Distance and Amplitude errors	Reference Pixel has sporadically shown wrap around effects and crosstalk related amplitude errors	Reference Pixel is fully supported including all pixel error compensations.
5	DCA reacts on disabled pixels in binning mask	All pixel results have been used for DCA regulation, also from pixels, which have been disabled in binning matrix.	Pixels, which are disabled in binning matrix, are ignored by the DCA now.

3. Known Issues and limitations:

Id	Issue	Description	Recommendation	Fix planned
1	Remaining short distance errors	For distances below 15cm there are still remission dependent distance errors possible (~1cm)	Use larger minimum integration depth values (DCA setting)	Future Software Release
2	Over- and undershoots of distance range after sudden strong remission changes	After a sudden strong remission change (e.g. retro reflector enters the Field of View), Distance values can differ from actual value for a few frames	Depending on requirements of application use higher sensor frame rates and filter within user application (ignore first frame after a negative status, or average)	Future Software Release
3	Sporadic reporting of valid ranges in outdoor “open sky” setting	If the sensor points to the sky and should report “infinity”, shotnoise can lead to sporadic wrong “valid” measurements.	If a safe reporting of “Infinite Distance” (no object detection) is more important to the application than highest indoor sensitivity, Shotnoise Monitor setting shall be changed from “Dynamic" to “StaticOutdoor”. With high ambient light, the static setting has no disadvantage for sensitivity.	Future Software Release