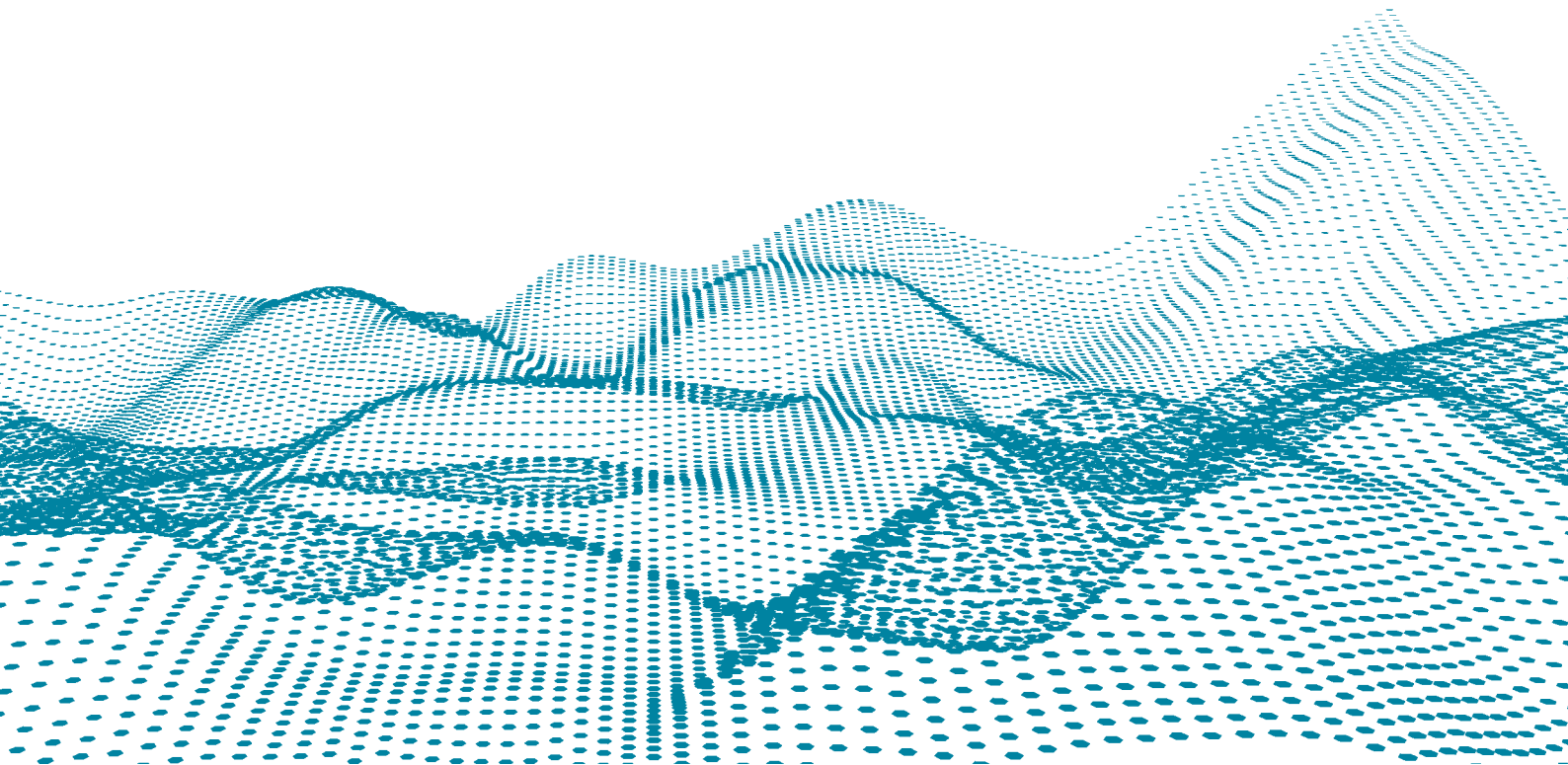


Changelog for Roboception rc_visard firmware

Roboception GmbH

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1 20.10.0 (2020-10-13)

1.1 New Features

- WebGUI:
 - 3D ROI visualization
 - simplified specification of grid size for calibration
- SilhouetteMatch (`rc_silhouettematch`):
 - added load carrier detection
 - added grasp point specification
 - integrated CollisionCheck module
- StereoMatching (`rc_stereomatching`):
 - smooth disparity interpolation
 - disparity border smoothing
- ItemPick (`rc_itempick`) and BoxPick (`rc_boxpick`):
 - common loadcarrier and ROI dbs
- GigE Vision/GenICam:
 - add support for GevSCSP (stream channel source port) with fixed port 50010

1.2 Fixes

- ItemPick (`rc_itempick`) and BoxPick (`rc_boxpick`):
 - updated grasp quality computation by taking distance into account

1.3 Other Changes

- Camera (`rc_stereocamera`):
 - set default for maximum exposure time to 18 ms
 - add parameters `exp_auto_average_min` and `exp_auto_average_max` for fine tuning of auto exposure
- StereoMatching (`rc_stereomatching`):
 - remove parameter `disprange`
 - remove parameter `median`
- IOControl (`rc_iocontrol`):
 - Set default of `out1_mode` to low
- GigE Vision/GenICam:
 - removed `DepthMedian`, `DepthDispRange`
 - add `RcExposureAutoAverageMax` and `RcExposureAutoAverageMin`
 - add `DeviceLinkSpeed`
 - minor updates and generic SFNC features

2 20.04.1 (2020-05-07)

2.1 Fixes

- ItemPick (`rc_itempick`) and BoxPick (`rc_boxpick`):
 - fix ROI pose if external frame is used
 - fix rejection un-normalized input quaterions
 - set timestamp in response even if request is invalid
- TagDetect (`rc_april_tag_detect` and `rc_qr_code_detect`):
 - set timestamp in response even if request is invalid

- always use full name for quality parameter (High, Medium, Low)
- SilhouetteMatch (`rc_silhouettematch`):
 - always use full name for quality parameter (High, Medium, Low)
 - detect service: return -1 (invalid argument) if ROI offset is larger than image
- Hand-Eye calibration (`rc_hand_eye_calibration`):
 - re-compute calibration on `calibrate` service call if `robot_mounted` parameter changed
- REST API and Web GUI:
 - correctly report MAC and link speed even if no default gateway is set
 - show 'AdaptiveOut1 Reduction' value on camera page if this exposure mode is chosen
 - fix issues with floating image streams on Chrome

3 20.04.0 (2020-04-17)

3.1 New Features

- ItemPick (`rc_itempick`) and BoxPick (`rc_boxpick`):
 - integrate new CollisionCheck module
 - add [load carrier filling level detection](#)
 - add load carrier overfilled flag
- SilhouetteMatch (`rc_silhouette`):
 - support [calibration to closest base plane](#) via new `plane_preference` parameter
- TagDetect (`rc_april_tag_detect` and `rc_qr_code_detect`):
 - add support for [external pose frame](#)
- Hand-Eye calibration (`rc_hand_eye_calibration`):
 - support calibration for robots with constrained motion, e.g. 4 DOF
 - add [set_calibration service](#) to re-upload calibration previously retrieved via `get_calibration`
- Camera:
 - add new [auto exposure mode AdaptiveOut1](#) that optimizes exposure for use with a projector
- Web GUI:
 - add [network configuration](#)
 - add download snapshot button on camera page
 - Try-out results can be downloaded as JSON file
 - show if device is not yet ready
- REST API:
 - add endpoints to change [network configuration](#)

3.2 Improvements and Fixes

- Stereo Matching (`rc_stereomatching`):
 - improvement of sub-pixel interpolation which reduces disparity steps
- Camera:
 - fixed auto-exposure flicker in full sunlight
- ItemPick (`rc_itempick`) and BoxPick (`rc_boxpick`):
 - improve segmentation and box detection
 - increase maximum number of ROIs and load carriers to 50
 - increase maximum allowed load carrier dimensions to 2m

3.3 Other Changes

- `rc_dynamics`:
 - add `return_code` to `get_cam2imu_transform` service
- REST API:

- improve error messages for invalid requests
- new `return_code` values for adding elements, e.g. ROIs or load carriers:
 - * 10: element was added but max capacity is now reached
 - * -10: new element could not be added because the capacity was exceeded

3.4 New Components

- CollisionCheck (`rc_collision_check`): This module provides an easy way to check if a gripper is in collision with a load carrier. It is integrated with the ItemPick and BoxPick modules, but can be used as standalone product. This feature is currently only available as part of the 3D-R Vision & Handling Set from our partner J. Schmalz GmbH.
 - documentation: <https://doc.rc-visard.com/latest/en/collisioncheck.html>
 - access via REST-API and EKI interface
 - configurable via Web GUI

4 1.8.4 (2020-01-24)

4.1 Fixes

- EKI bridge: on error return more useful `return_code` from corresponding module
- `rc_stereomatching`:
 - Reset image buffer for static mode on trigger or switching to single shot
- `rc_stereocamera`:
 - Fixed reporting of baseline in diagnostic messages

5 1.8.3 (2019-12-02)

5.1 Fixes

- SilhouetteMatch (`rc_silhouettematch`): increase data acquisition timeout to 5s
- `rc_stereomatching`: make `aquisition_trigger` service available again
- REST-API:
 - improve serialization error messages
 - return http code 400 if service call failed with invalid argument

6 1.8.2 (2019-11-19)

6.1 Fixes

- fix model name for color sensors

7 1.8.1 (2019-11-18)

7.1 Fixes

- EKI bridge: fix handling of empty lists
- SilhouetteMatch (`rc_silhouettematch`): performance improvements
- `rc_stereocamera`:
 - Fixed error when choosing very small exposure region
 - Only apply new signal masks for GPIO outputs if they differ from the previous ones, so that the alternate pattern is not interrupted
- Web GUI: fix flipped grid visualization thumbnails on hand-eye-calibration page

8 1.8.0 (2019-10-07)

8.1 New Components

- SilhouetteMatch (`rc_silhouettematch`): This module detects position and orientation of comparatively flat objects that are positioned on a plane, by matching the scene at hand to a previously taught template.
 - documentation: <https://doc.rc-visard.com/latest/en/silhouettematch.html>
 - shop: <https://roboception.com/product/silhouettematch/>
 - access via REST-API
 - configurable via Web GUI
- EKI bridge: The Ethernet KRL Interface (EKI Bridge) allows communicating with the `rc_visard` from KUKA KRL via `KUKA.EthernetKRL XML`.
 - Use `rc_reason` onboard software with KUKA robots without any external PC
 - documentation: <https://doc.rc-visard.com/latest/en/eki.html>
 - shop: <https://roboception.com/product/ekibridge/>

8.2 New Features

- Web GUI:
 - Hand-eye calibration: allow redoing poses
- `rc_stereomatching`:
 - Add new acquisition mode `SingleFrameOut1`. This mode can be used to control an external projector. It sets the line source of `Out1` to `ExposureAlternateActive` upon each trigger and resets it to `Low` as soon as the images for stereo matching are grabbed. (Requires IOControl license)

8.3 Fixes

- ItemPick (`rc_itempick`):
 - bugfix for grasp computation on surfaces with holes
- GigE Vision/GenICam:
 - fix max `PayloadSize`

8.4 Other Changes

- REST-API:
 - `save_parameters` and `reset_defaults` return `return_code` instead of just message string

9 1.7.0 (2019-07-22)

9.1 New Features

- GigE Vision/GenICam:
 - add ChunkComponentIDValue according to SFNC 2.5
 - add ChunkDecimationHorizontal ChunkDecimationVertical
 - add ChunkLineSource and ChunkLineSelector
- ItemPick (rc_itempick):
 - sorting of grasps using gravity and size
 - accept lc and roi in camera pose_frame even if request is for external
 - compute grasp quality from surface rmse
 - performance improvements

9.2 Fixes

- fix log rotation for nginx to prevent disk running full
- GigE Vision/GenICam:
 - fix Decimation and Width for depth images in Low res
 - also apply AcquisitionAlternateFilter for SynchronizedComponents except if it would result in no images being sent
- ItemPick (rc_itempick) and BoxPick (rc_boxpick):
 - various small fixes/improvements

9.3 Other Changes

- rc_dynamics:
 - added state-machine state "STOPPING"
- REST-API:
 - possibility to add/delete multiple datastream destinations at once
- ItemPick (rc_itempick) and BoxPick (rc_boxpick):
 - made pose_frame argument always required

10 1.6.1 (2019-04-01)

10.1 Fixes

- Web GUI:
 - fix for new BoxPick page

11 1.6.0 (2019-03-28)

11.1 New Components

- BoxPick (rc_boxpick): The optional on-board component of the rc_visard, which provides a perception solution for robotic pick-and-place applications such as de-/palletizing and sorting of packets. It allows the detection of stationary items with rectangular surfaces and the determination of their position, orientation and size for picking.

- documentation: <https://doc.rc-visard.com/latest/en/boxpick.html>
- shop: <https://roboception.com/product/boxpick/>
- access via REST-API
- configurable via Web GUI

11.2 New Features

- Web GUI:
 - depth image: add single frame acquisition mode
 - page for new BoxPick component
- GigE Vision/GenICam:
 - add DecimationHorizontal and DecimationVertical as readonly features
 - report if system is ready (fully booted) via custom RcSystemReady feature

11.3 Fixes

- Web GUI:
 - Improve translation of labels and info boxes
 - Various fixes in region of interest modal
 - Fix race condition in hand-eye-calibration
- ItemPick (`rc_itempick`):
 - scale all pixel parameters with resolution
 - various fixes/improvements for corner cases

11.4 Other Changes

- Web GUI:
 - Add acquisition mode parameter to depth image page
 - ItemPick, BoxPick, TagDetect, QRDetect: Request new detection only, if last response has arrived.
 - Hand-Eye-Calibration replace error modal popup with error message under each pose
- REST-API:
 - warn if service request contains unused args
 - itempick RegionOfInterest: only return actually used type (box or sphere)
 - also lock service calls of `rc_stereocamera`, `rc_stereomatching` and `rc_iocontrol` if a GEV application is connected
- StereoPlus (`rc_stereomatching`):
 - enable smoothing by default
- ItemPick (`rc_itempick`):
 - deprecate `item_model_tolerance` parameter (now read-only)
- TagDetect (`rc_april_tag_detect`):
 - performance improvements
- SLAM (`rc_slam`):
 - improve map loading and resets/restarts

12 1.5.0 (2019-01-31)

12.1 New Features

- New Module: StereoPlus (`rc_stereomatching`):
 - disparity image smoothing (enabled via `smooth` parameter)

- full resolution disparity image
- Web GUI:
 - add exposure region selection via mouse
 - floating video streams
 - new parameters for StereoPlus (full resolution and smoothing)
 - allow deletion of hand-eye-calibration
 - hand-eye-calibration page shows current sensor mounting

12.2 Fixes

- Web GUI:
 - several layout/UI improvements and fixes
 - Hide white balance settings on calibration page
 - ItemPick update streams shown only after detection
 - fix kuka pose format calculations
- rc_hand_eye_calibration:
 - If calibration error is NaN or Inf, return failure with status code 2 and a message
 - fix concurrency bug
- ItemPick (rc_itempick):
 - surface segmentation: fix return code when roi is empty
- GigE Vision/GenICam:
 - return correct baseline and focal_length_factor even before fully booted up
- IOControl
 - fix GPIO output when switching from active to low

12.3 Other Changes

- add baseline and color/monochrome version to model name, e.g. "rc_visard 160m"
- GigE Vision/GenICam:
 - add GenICam parameters for StereoPlus:
 - * add DepthSmooth (requires stereo_plus license)
 - * add Full quality (requires stereo_plus license)
 - * remove StaticHigh quality
 - * add DepthStaticScene parameter (replacing StaticHigh, but also works in Full)
 - remove GevTimestampControlReset
 - add and fix TimestampLatch and TimestampLatchValue (GEV counterparts are deprecated)
 - add DeviceFirmwareVersion (same as DeviceVersion for now)
 - add sent_frames, dropped_frames and packet_resends in REST-API status values
- SLAM (rc_slam):
 - add return_code in get_trajetory response
 - add number of map_frames in status values

13 1.4.0 (2018-10-19)

13.1 New Components

- ItemPick (rc_itempick): The optionally available software component provides an out-of-the-box and model-free perception solution for robotic pick-and-place applications with suction grippers.
 - documentation: <https://doc.rc-visard.com/latest/en/itempick.html>
 - access via REST-API
 - configurable via Web GUI

13.2 New Features

- Web GUI redesign:
 - additional modules pages:
 - * ItemPick
 - * AprilTag and QRCode Detect
 - * IOControl
 - camera page:
 - * set gain manually
 - * set white balance manually for color cameras
- GigE Vision/GenICam:
 - support for GigE Vision 2.1 MultiPart
 - add DepthAcquisitionMode and DepthAcquisitionTrigger
 - add SFNC 2.4 category PtpControl with
 - * PtpEnable
 - * PtpDataSetLatch
 - * PtpStatus
 - * PtpOffsetFromMaster
 - add AcquisitionMultiPartMode enum with
 - * SingleComponent: Immediately send one single component per frame/buffer when it becomes available.
 - * SynchronizedComponents: Only send a multipart frame/buffer iff all enabled components are available for that time.
- Improved auto exposure for reducing overexposure

13.3 Fixes

- REST-API:
 - return 400 error if parameter is out of min/max range
 - update Swagger UI to get correct cURL examples for Windows

13.4 Other Changes

- Web GUI:
 - removed French and Chinese translations

14 1.3.1 (2018-08-28)

14.1 Fixes

- REST-API:
 - fix error messages on service call failures (when some messages fields are of wrong type)
- GigE Vision/GenICam:
 - only reset block id when a new stream channel is opened
 - reduce latency on changing enabled components
- Web-GUI:
 - make doc links work in proxied environment

15 1.3.0 (2018-07-25)

15.1 New Components

- IO and projector control (`rc_iocontrol`): The optionally available software component allows read and write access to the `rc_visard`'s GPIOs, e.g. to synchronize with external pattern projectors.
 - documentation: <https://doc.rc-visard.com/latest/en/iocontrol.html>
 - access via REST-API
 - access via GigE Vision/GenICam interface:
 - * category: `DigitalIOControl`, features: `LineStatus`, `LineSource`, etc.
 - * custom `AcquisitionAlternateFilter` which makes it possible to receive only images with/without projector(`gpio`) on

15.2 New Features

- TagDetect (`rc_april_tag_detect` and `rc_qr_code_detect`):
 - add `detect_inverted_tags` parameter that allows detection of negative, i.e. black/white inverted QRcodes and AprilTags in front of black background.
 - possibility to specify approximate tag size to resolve ambiguous stereo tag matching
- GigE Vision/GenICam:
 - add support for setting exposure region:
 - * `ExposureRegionWidth`, `ExposureRegionHeight`, `ExposureRegionOffsetX`, `ExposureRegionOffsetY`
 - support extended chunk mode
 - new SFNC 2.4 features:
 - * `Scan3dFocalLegth`, `Scan3dBaseline`, `Scan3dPrincipalPointU`, `Scan3dPrincipalPointV`
- SLAM (`rc_slam`):
 - add services to persist and load onboard created maps (`save_map`, `load_map`, `remove_map`)

15.3 Other Changes

- `rc_stereomatching`:
 - remove `force_on` parameter from public interface
- `rc_itempick`:
 - add `clustering_max_surface_rmse` parameter
 - performance improvements

15.4 Fixes

- `rc_stereo_ins`:
 - fixed correction offsets in case of long vision outages
- `rc_april_tag_detect` and `rc_qr_code_detect`:
 - fix memory leak
 - improved matching between left and right image
- REST-API:
 - fix locking of service calls if module is not licensed
 - make log download work in tunneled/proxied environment
 - fix persistent storage of boolean parameters
- GigE Vision/GenICam:
 - fixes for better compatibility with some clients
 - some nodes like `PixelFormat`, `Width`, `Height` now correctly depend on `ComponentSelector`
 - `DeviceVersion`: report image version instead of `rc_gev_server` version

16 1.2.1 (2018-05-04)

16.1 Changes

- `rc_gev_server`:
 - add `packet_size` to status values in REST-API

16.2 Fixes

- `rc_slam`:
 - fixed map localization
 - fixed various internal issues
 - do "restart" when "start"ed in HALTED, so the internal state is cleared.
- `rc_stereo_ins` and `rc_dynamics`
 - fixes for communication timeouts
 - Use start on SLAM, not always restart (which drops the map)
- GigE Vision/GenICam:
 - fix race on (un)subscribing to images on heartbeat timeout
- REST-API:
 - fix loading of saved boolean parameters at startup

17 1.2.0.1 (2018-04-05)

17.1 Fixes

- `rc_itempick`:
 - Make sure that the grasp z-axis points into item (according to the camera z-axis)

18 1.2.0 (2018-03-29)

18.1 New components

- `rc_itempick`
- `rc_april_tag_detection`
- `rc_qr_code_detection`

18.2 Changes

- `rc_hand_eye_calibration`
 - add `remove_calibration` service

18.3 Fixes

- request NTP servers from DHCP
- `rc_stereocalib`
 - Force syncing of calibration files and images to disc
- Web GUI:

- show hand-eye calibration images again
- update chinese translation

19 1.1.1 (2018-02-22)

19.1 New Features

- `rc_stereocamera`:
 - added parameters to select a rectangular region used for calculating auto exposure:
 - * `exp_offset_x`, `exp_offset_y`, `exp_width` and `exp_height`

19.2 Changes

- `rc_hand_eye_calibration`:
 - provide `robot_mounted` bool with `get_calibration` service
- REST API:
 - include detailed info for all nodes (status, parameters, services) in log tarball
 - limit to 10 destinations per datastream

19.3 Fixes

- GigE Vision/GenICam:
 - immediately sync network settings to disk after changes
- Web GUI:
 - minor update to chinese translations
- fix switching of partitions via magic packet (via `rcdiscover`)
- improve system robustness under high load
- REST API:
 - fixes for ros service call response to API mappings
 - fix: correctly boot into new image if sensor is power-cycled immediately after update
- `rc_stereo_ins`:
 - fix initialization when camera doesn't see anything
 - improve robustness
- `rc_slam`:
 - autorecovery now also recovers the map
- `rc_dynamics`:
 - improve performance and robustness

20 1.1.0 (2018-01-19)

- Web GUI now also in French and Chinese
- new "producer" field in `rc_dynamics_msgs` Frame and Dynamics
- REST API:
 - fix bool parameters, actually return true/false and validate input correctly
- first release of SLAM
- `rc_dynamics`:
 - add `start_slam`, `stop_slam`, `restart_slam` services