

PhotonVisionLib LabVIEW

Reference

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Function Groups

Packet

Packet_decode_ByteI8



Decode (or strip out) an unsigned byte from an array of bytes. No conversion or decoding is actually done, the memory is just copied, and the value is cast to the correct type.

Inputs

- RawData -- Array of bytes containing the data to be extracted.
- StartByte -- The starting byte number (the first byte starts at 0)

Outputs

- Int8_Value -- Byte in the form of an INT 8 value.
- NextByte -- The starting byte index for the next value (regardless of type).

Packet_decode_Flt64



Decode (or strip out) a double precision floating point value FLT 64. No conversion or decoding is actually done, the memory is just copied, and the value is cast to the correct type.

Inputs

- RawData -- Array of bytes containing the data to be extracted.
- StartByte -- The starting byte number (the first byte starts at 0)

Outputs

- FLT64_Value -- Extracted float 64 (double) value.
 - NextByte -- The starting byte index for the next value (regardless of type).
-

Packet_decode_Int32



Decode (or strip out) a 32 bit integer value from the provided byte array. No conversion or decoding is actually done, the memory is just copied, and the value is cast to the correct type.

Inputs

- RawData -- Array of bytes containing the data to be extracted.
- StartByte -- The starting byte number (the first byte starts at 0)

Outputs

- INT32_Value -- Extracted 32 bit integer value.
- NextByte -- The starting byte index for the next value (regardless of type).

Packet_decode_Transform3d



Decode (or strip out) a Transform3d value from the provided byte array. No conversion or decoding is actually done, the memory is just copied, and the value is cast to the correct type.

Inputs

- RawData -- Array of bytes containing the data to be extracted.
- StartByte -- The starting byte number (the first byte starts at 0)

Outputs

- Transform3d -- Extracted Transform3d cluster.
- NextByte -- The starting byte index for the next value (regardless of type).

Packet_encode_ByteI8



Encode (or append) an unsigned byte at the end of an array of bytes. No conversion is actually done, the memory is just copied to the end of the array.

Inputs

- RawData In -- Array of bytes to be appended to..
- Int8_Value -- Byte in the form of an INT 8 value.

Outputs

- RawData Out -- Array of bytes containing the appended value.

Packet_encode_FLT64



Encode (or append) a double floating point value (FLT 64) at the end of an array of bytes. No conversion is actually done, the memory is just copied to the end of the array.

Inputs

- RawData In -- Array of bytes to be appended to..
- FLT64_Value -- Double floating point value.

Outputs

- RawData Out -- Array of bytes containing the appended value.

Packet_encode_Int32



Encode (or append) a 32 bit integer at the end of an array of bytes. No conversion is actually done, the memory is just copied to the end of the array.

Inputs

- RawData In -- Array of bytes to be appended to..
- In32_Value -- 32 bit integer the form of an INT 32 value.

Outputs

- RawData Out -- Array of bytes containing the appended value.

Packet_encode_Transform3d



Encode (or append) a double floating point value (FLT 64) at the end of an array of bytes. No conversion is actually done, the memory is just copied to the end of the array.

Inputs

- RawData In -- Array of bytes to be appended to..
- FLT64_Value -- Double floating point value.

Outputs

- RawData Out -- Array of bytes containing the appended value.

PhotonCamera

PhotonCamera_GetDriverMode



Returns whether the camera is in driver mode.

Inputs:

- CameraName -- The nickname of the camera (found in the PhotonVision UI).

Outputs:

- DriverMode -- Boolean indicating whether the camera is in driver mode.
-

PhotonCamera_GetLEDMode



Returns the current LED mode.

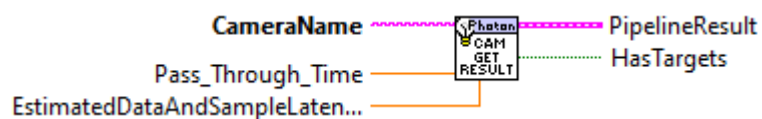
Inputs:

- CameraName -- The nickname of the camera (found in the PhotonVision UI).

Outputs:

- LedMode -- The current LED mode.
-

PhotonCamera_GetLatestResult



Returns the latest pipeline result.

Inputs:

- cameraName -- The nickname of the camera (found in the PhotonVision UI).
- PassThroughTime -- (Optional. Default: Use FPGA time.) Time. Once time is available from network tables, this won't be needed. (Seconds)
- EstimatedDataAndSampleLatency -- Estimated Network Table packet latency. This is based on the frames per second and other communications latencies. (Optional. Default: 0.050) Once time is available from network tables, this won't be needed.

Outputs:

- PipelineResult -- The latest pipeline result data cluster
- HasTargets -- Boolean indicating if any targets were found

PhotonCamera_GetPipelineIndex



Returns the active pipeline index.

Inputs:

- cameraName -- The nickname of the camera (found in the PhotonVision UI).

Outputs:

- PipelineIndex -- Active Pipeline Index

PhotonCamera_IsConnected



Determines if communications to camera is valid.

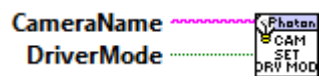
Inputs:

- CameraName -- The nickname of the camera (found in the PhotonVision UI).

Outputs:

- IsConnected -- TRUE if communications have been received within the last 0.5 seconds.

PhotonCamera_SetDriverMode



Toggles driver mode.

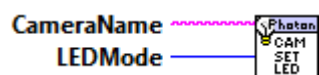
Inputs:

- cameraName -- The nickname of the camera (found in the PhotonVision UI).
- DriverMode -- Whether to set driver mode.

Outputs:

- >none<

PhotonCamera_SetLEDMode



Sets the LED mode.

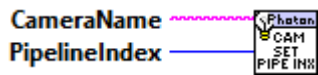
Inputs:

- CameraName -- The nickname of the camera (found in the PhotonVision UI).
- LedMod -- The mode to set to.

Outputs:

- >none<
-
-

PhotonCamera_SetPipelineIndex



Allows the user to select the active pipeline index.

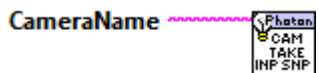
Inputs:

- cameraName -- The nickname of the camera (found in the PhotonVision UI).
- index The active pipeline index.

Outputs:

- >none<

PhotonCamera_TakeInputSnapshot



Request the camera to save a new image file from the input camera stream with overlays. Images take up space in the filesystem of the PhotonCamera. Calling it frequently will fill up disk space and eventually cause the system to stop working. Clear out images in /opt/photonvision/photonvision_config/imgSaves frequently to prevent issues.

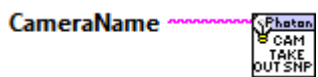
Inputs:

- cameraName -- The nickname of the camera (found in the PhotonVision UI).

Outputs:

- >none<

PhotonCamera_TakeOutputSnapshot



Request the camera to save a new image file from the output stream with overlays. Images take up space in the filesystem of the PhotonCamera. Calling it frequently will fill up disk space and eventually cause the system to stop working. Clear out images in /opt/photonvision/photonvision_config/imgSaves frequently to prevent issues.

Inputs:

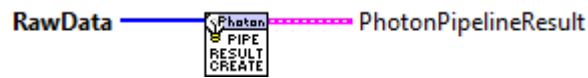
- CameraName -- The nickname of the camera (found in the PhotonVision UI).

Outputs:

- >none<

PhotonPipelineResult

PhotonPipelineResult_CreateFromPacket



Internal function to parse the data returned by PhotonCamera_GetLatestResult.

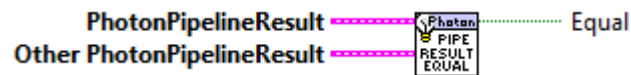
Inputs:

- RawData -- Byte array containing the data to parse.

Outputs:

- PipelineResult -- Parsed PipelineResult cluster.
-

PhotonPipelineResult_Equals



Determines if two PipelineResults are equal.

Inputs:

- PipelineResult -- PipelineResult cluster.
- Other PipelineResult -- Other PipelineResult cluster.

Outputs:

- Equal -- Returns TRUE, if both pipeline results are equal..
-

PhotonPipelineResult_GetBestTarget



Returns the best target in this pipeline result. If there are no targets, this method will return an empty target. The best target is determined by the target sort mode in the PhotonVision UI.

Inputs:

- PipelineResult -- Parsed PipelineResult cluster.

Outputs:

- TrackedTarget -- Cluster containing the best target

PhotonPipelineResult_GetBestTargetById



Returns the best target in this pipeline result filtered by fiducial ID (April tag number). If there are no targets, or no targets with this fiducial ID, this method will return an empty target. IF more than 1 targets have the same fiducial ID, the best target is determined by the sort mode in the PhotonVision UI.

Inputs:

- PipelineResult -- Parsed PipelineResult cluster.
- Fiducial ID -- The April tag number being searched for.

Outputs:

- TrackedTarget -- Cluster containing the best target
- TargetFound -- TRUE if a target matching the search criteria exists.
- TargetIndex -- Index into the targets array of the best target matching the search criteria.

PhotonPipelineResult_GetLatency_Millis



Returns the latency in the pipeline.

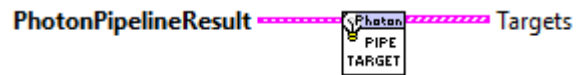
Inputs:

- PipelineResult -- Parsed PipelineResult cluster.

Outputs:

- Latency_Millis -- The latency in the pipeline.
- TimeStampSec -- Time stamp of packet (FPGA elapsed time) seconds

PhotonPipelineResult_GetTargets



Returns the targets in this pipeline result. If there are no targets, this method will return an empty target array.

Inputs:

- PipelineResult -- Parsed PipelineResult cluster.

Outputs:

- Targets -- Array of Target clusters.

PhotonPipelineResult_GetTimeStampSecs



Returns pipeline packet time stamp

Inputs:

- PipelineResult -- Parsed PipelineResult cluster.

Outputs:

- TimeStampSec -- Time stamp of packet (FPGA elapsed time) seconds

PhotonPipelineResult_HasTargets



Returns whether the pipeline has targets.

Inputs:

- PipelineResult -- Parsed PipelineResult cluster.

Outputs:

- HasTargets -- Whether the pipeline has targets.

PhotonPipelineResult_New



Create a new PhotonPipelineResult cluster.

Inputs:

- Latency_Millis -- Latency, milliseconds
- TrackedTargets -- Array of TracedTarget clusters

Outputs:

- PipelineResult -- Parsed PipelineResult cluster.

PhotonPipelineResult_PopulatePacket



Convert a PipelineResult to a Packet array of bytes ready for writing to a Network Table variable.

Inputs:

- PipelineResult -- PipelineResult cluster.

Outputs:

- Pacet_RawData -- Byte array containing the encoded PipelineResult.
-

PhotonPipelineResult_SetTimeStampSecs



Returns pipeline packet time stamp

Inputs:

- PipelineResult -- Parsed PipelineResult cluster.
- TimeStampSec -- Time stamp of packet (FPGA elapsed time) seconds

Outputs:

- Out PipelineResult -- Updated PipelineResult cluster.

PhotonTrackedTarget

PhotonTrackedTarget_CreateFromPacket



Internal function to parse the data for each target returned by PhotonCamera_GetLatestResult.

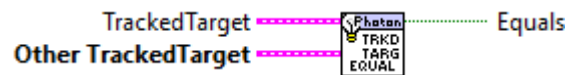
Inputs:

- RawData -- Byte array containing the data to parse.

Outputs:

- TrackedTarget -- Parsed TrackedTarget cluster.
-

PhotonTrackedTarget_Equals



Determines if two tracked targets are equal

Inputs:

- TrackedTarget -- TrackedTarget cluster.
- OtherTrackedTarget -- Second TrackedTarget cluster.

Outputs:

- Area -- Boolean, equals TRUE if both TrackedTargets are the same.
-

PhotonTrackedTarget_GetAltCameraToTarget



Get CameraToTarget Transform2d from Tracked Target

Inputs:

- TrackedTarget -- Parsed TrackedTarget cluster.

Outputs:

- CameraToTarget -- Camera to Target Transform2d

PhotonTrackedTarget_GetArea



Get Area from Tracked Target

Inputs:

- TrackedTarget -- Parsed TrackedTarget cluster.

Outputs:

- Area -- Area value

PhotonTrackedTarget_GetBestCameraToTarget



Get CameraToTarget Transform2d from Tracked Target

Inputs:

- TrackedTarget -- Parsed TrackedTarget cluster.

Outputs:

- CameraToTarget -- Camera to Target Transform2d

PhotonTrackedTarget_GetDetectedCorners



Get Detected Corners from Tracked Target

Inputs:

- TrackedTarget -- Parsed TrackedTarget cluster.

Outputs:

- Detected Corners -- Array of TargetCorner cluster containing detected corners

PhotonTrackedTarget_GetFiducialId



Get Area from Tracked Target

Inputs:

- TrackedTarget -- Parsed TrackedTarget cluster.

Outputs:

- Area -- Area value

PhotonTrackedTarget_GetMinAreaRectCorners



Get Minimum Area Rectagle Corners from Tracked Target

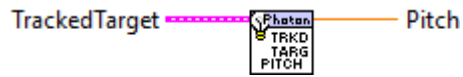
Inputs:

- TrackedTarget -- Parsed TrackedTarget cluster.

Outputs:

- MinAreaRectCorners -- Corners array of TargetCorner cluster
-
-

PhotonTrackedTarget_GetPitch



Get Pitch from Tracked Target

Inputs:

- TrackedTarget -- Parsed TrackedTarget cluster.

Outputs:

- Pitch -- Pitch value

PhotonTrackedTarget_GetPoseAmbiguity



Get Area from Tracked Target

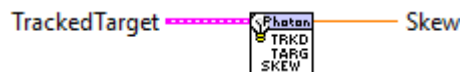
Inputs:

- TrackedTarget -- Parsed TrackedTarget cluster.

Outputs:

- Area -- Area value

PhotonTrackedTarget_GetSkew



Get Skew from Tracked Target

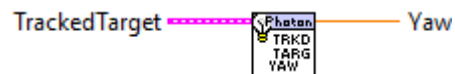
Inputs:

- TrackedTarget -- Parsed TrackedTarget cluster.

Outputs:

- Skew -- Skew value

PhotonTrackedTarget_GetYaw



Get Yaw from Tracked Target

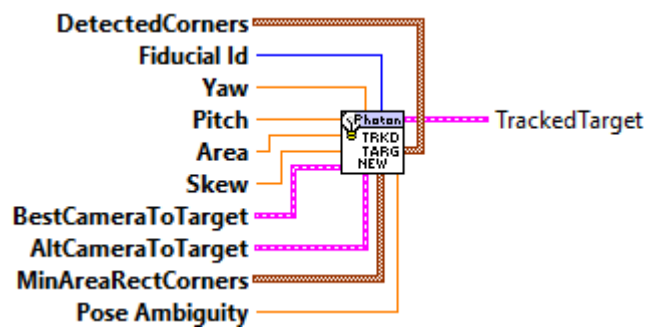
Inputs:

- TrackedTarget -- Parsed TrackedTarget cluster.

Outputs:

- Yaw -- Yaw value

PhotonTrackedTarget_New



Create a new TrackedTarget data cluster

Inputs:

- Yaw --
- Pitch --
- Area --
- Skew --
- CameraToTarget -- Transform2d
- MinAreaRectCorners -- Array of 4 corners.
- Pose Ambiguity
- Fiducial ID

- Detected Corners

Outputs:

- TrackedTarget -- Created TrackedTarget cluster.

PhotonTrackedTarget_PopulatePacket



Encode a TrackedTarget cluster into an array of bytes.

Inputs:

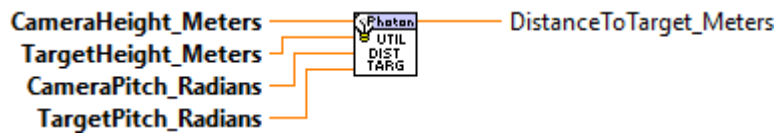
- TrackedTarget -- TrackedTarget cluster.

Outputs:

- RawDataOut -- Byte array containing the encoded data.

PhotonUtils

PhotonUtils_CalculateDistanceToTarget



Algorithm from https://docs.limelightvision.io/en/latest/cs_estimating_distance.html Estimates range to a target using the target's elevation. This method can produce more stable results than SolvePNP when well tuned, if the full 6d robot pose is not required. Note that this method requires the camera to have 0 roll (not be skewed clockwise or CCW relative to the floor), and for there to exist a height differential between goal and camera. The larger this differential, the more accurate the distance estimate will be.

Units can be converted using the `{@link edu.wpi.first.math.util.Units}` class.

Inputs:

- CameraHeight_Meters -- The physical height of the camera off the floor
in meters.
- TargetHeightMeters -- The physical height of the target off the floor in meters.

This should be the height of whatever is being targeted (i.e. if the targeting region is set to top, this should be the height of the top of the target).

- CameraPitch_Radians -- The pitch of the camera from the horizontal plane
in radians.
Positive values up.
- TargetPitchRadian -- The pitch of the target in the camera's lens in radians.
Positive values up.

Outputs

- DistanceToTarget_Meters -- The estimated distance to the target in meters.
-

PhotonUtils_EstimateCameraToTarget



Estimates a Transform2d that maps the camera position to the target position, using the robot's gyro. Note that the gyro angle provided *must* line up with the field coordinate system -- that is, it should read zero degrees when pointed towards the opposing alliance station, and increase as the robot rotates CCW.

Inputs:

- CameraToTargetTranslation -- A Translation2d that encodes the x/y position of the target relative to the camera.
- FieldToTarget -- A Pose2d representing the target position in the field coordinate system.
- GyroAngle -- The current robot gyro angle, likely from odometry.

Outputs:

- EstimateCameraToTarget -- A Transform2d that takes us from the camera to the target.

PhotonUtils_EstimateCameraToTargetTrans



Estimate the Translation2d of the target relative to the camera.

Inputs:

- TargetDistance_Meters -- The distance to the target in meters.
- Yaw -- The observed yaw of the target.

Outputs:

- CameraToTarget -- The target's camera-relative translation.
-
-

PhotonUtils_EstimateFieldToCamera



Estimates the pose of the camera in the field coordinate system, given the position of the target relative to the camera, and the target relative to the field. This **only** tracks the position of the camera, not the position of the robot itself.

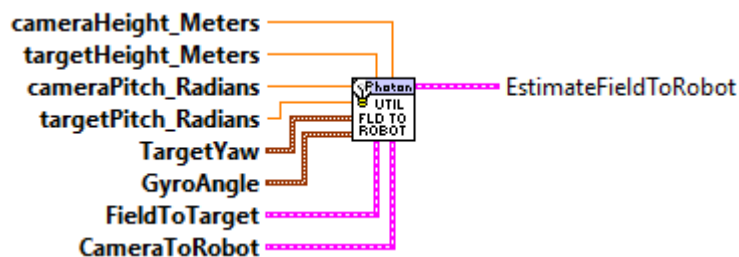
Inputs:

- CameraToTarget -- The position of the target relative to the camera.
- FieldToTarget -- The position of the target in the field.

Outputs:

- EstimateFieldToCamera -- The position of the camera in the field.

PhotonUtils_EstimateFieldToRobot



Estimate the position of the robot in the field.

Inputs:

- CameraHeightMeters The physical height of the camera off the floor in meters.
- TargetHeightMeters The physical height of the target off the floor in meters.

This should be the height of whatever is being targeted (i.e. if the targeting region is set to top, this should be the height of the top of the target).

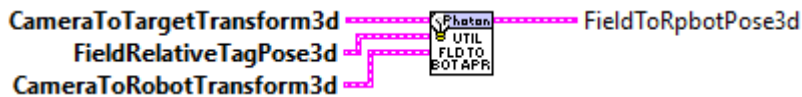
- CameraPitchRadians The pitch of the camera from the horizontal plane in radians. Positive values up.
- TargetPitchRadians The pitch of the target in the camera's lens in radians. Positive values up.

- TargetYaw The observed yaw of the target. Note that this **must** be CCW-positive, and Photon returns CW-positive.
- GyroAngle The current robot gyro angle, likely from odometry.
- FieldToTarget A Pose2d representing the target position in the field coordinate system.
- CameraToRobot The position of the robot relative to the camera. If the camera was mounted 3 inches behind the "origin" (usually physical center) of the robot, this would be Transform2d (3 inches, 0 inches, 0 degrees).

Outputs

- EstimateFieldToRobot -- The position of the robot in the field.

PhotonUtils_EstimateFieldToRobotAprilTag



Estimates the pose3d of the robot in the field coordinate system, given the pose3d of the fiducial tag, the robot relative to the camera, and the target relative to the camera.

Inputs:

- CameraToTarget -- Transform3D of the target relative to the camera, returned by PhotonVision
- FieldRelativeTagPose3d -- The field relative pose3d of the target
- CameraToRobot -- Transform3D of the robot relative to the camera. Origin of the robot is defined as the center.

Outputs

- FieldToRobot -- Transform3d Robot position relative to the field
-
-

PhotonUtils_EstimateFieldToRobot_Alt



Estimates the pose of the robot in the field coordinate system, given the position of the target relative to the camera, the target relative to the field, and the robot relative to the camera.

Inputs:

- CameraToTarget -- The position of the target relative to the camera.
- FieldToTarget -- The position of the target in the field.
- CameraToRobot -- The position of the robot relative to the camera. If the camera was mounted 3 inches behind the "origin" (usually physical center) of the robot, this would be Transform2d(3 inches, 0 inches, 0 degrees).

Outputs:

- EstimateFieldToRobot -- The position of the robot in the field.

PhotonUtils_GetDistanceToPose



Returns the distance between two poses

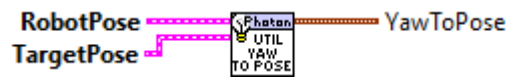
Inputs:

- RobotPose -- Pose2d of the robot.
- TargetPose -- Pose2d of the target

Outputs

- DistanceToPose -- The calculated distance between the poses.
-
-

PhotonUtils_GetYawToPose



Returns the yaw between your robot and a target.

Inputs:

- RobotPose -- Pose2d of the robot.
- TargetPose -- Pose2d of the target

Outputs

- YawToPose -- Yaw to the target

TargetCorner

TargetCorner_Equals



Determines if two target corners are equal

Inputs:

- TargetCorner -- TargetCorner cluster
- OtherTargetCorner -- TargetConrner cluster to compare

Outputs:

- Equals -- TRUE if both TargetCorners are equal

TargetCorner_GetAll



Get the individual components of a TargetCorner

Inputs:

- TargetCorner -- TargetCorner cluster

Outputs:

- X --
- Y --

TargetCorner_New



Create a new TargetCorner data cluster

Inputs:

- X --
- Y --

Outputs:

- TargetCorner -- Created TargetCorner cluster.

Type Definitions

TypeDef

TypeDef-PhotonPipelineResultType



PhotonPipelineResult

TargetCount

0

Latency_MilliSec

0

TimeStampSec

0

Targets

Yaw

0

Pitch

0

Area

0

Skew

0

MinAreaRectCorners

0

DetectedCorners

0

FiducialId

0

PoseAmbiguity

0

BestCameraToTarget

TRANSLATION3D

X

0.000

Y

0.000

Z

0.000

XF

ROTATION3D

Q_quaternion

R

1

V

0

0

0

AltCameraToTarget

TRANSLATION3D

X

0.000

Y

0.000

Z

0.000

XF

ROTATION3D

Q_quaternion

R

1

V

0

0

0

TypeDef-PhotonTrackedTargetType



PhotonTrackedTarget

Yaw

0

Pitch

0

Area

0

Skew

0

MinAreaRectCorners

0

X

0

Y

0

DetectedCorners

0

X

0

Y

0

FiducialId

0

PoseAmbiguity

0

BestCameraToTarget

TRANSLATION3D

X

0.000

Y

0.000

Z

0.000

XF

ROTATION3D

Q_quaternion

R

1

V

0

0

0

AltCameraToTarget

TRANSLATION3D

X

0.000

Y

0.000

Z

0.000

XF

ROTATION3D

Q_quaternion

R

1

V

0

0

0

TypeDef-TargetCornerType

TARGET
CORNER

TargetCorner

X

0

Y

0

Enumerated Type Definitions

Enum

Enum-VisionLEDModeType

