APPENDIX D Product Label Keyword Definitions, Values, Sources

Dictionary:**PDS4 Keyword** *VICAR Property.**VICAR Keyword***	**General Definition** *InSight-Specific Information*	**XPath** Valid Values (attribute) *Children (class)*	 Data Type *Units*
msn_surface:**application_name** *TELEMETRY.**APPLICATION_PROCESS_NAME***	The application_name attribute provides the name associated with the source or process which created the data. **InSight Specific:** *Indicates the Application ID (APID) name for this product. APID's are used to distinguish types of telemetry products.*	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Mission_Parameters/Telemetry_Information/application_name**	
			ASCII_Short_String_Collapsed
geom:**selected_instrument_id** *ARM_ARTICULATION_STATE.**ARTICULATION_DEV_INSTRUMENT_ID***	The selected_instrument_id attribute specifies an abbreviated name or acronym that identifies the selected instrument mounted on the articulation device.	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Articulation_Device_Parameters[1]/selected_instrument_id**	
			ASCII_Short_String_Collapsed
geom:**device_id** *GRAPPLE_ARTICULATION_STATE.**ARTICULATION_DEVICE_ID***	The device_id attribute specifies the abbreviated identification of an articulation device.	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Articulation_Device_Parameters[1]/device_id** **2) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Articulation_Device_Parameters[2]/device_id**	
			ASCII_Short_String_Collapsed
geom:**device_mode** *GRAPPLE_ARTICULATION_STATE.**ARTICULATION_DEVICE_MODE***	The device_mode attribute specifies the deployment state (i.e., physical configuration) of an articulation device at the time of data acquisition. Examples include 'Arm Vibe', 'Deployed', 'Free Space', 'Stowed'. Note: the value set for this attribute is mission-specific and should be declared in a mission-specific dictionary. **InSight Specific:** *State of the grapple fingers. The value is determined by the IDA FSW by reading the state of the two limit switches on the grapple. It affects when the grapple opening algorithm completes. Bit 0 is the "fingers closed" switch, with 0=fingers-not-closed and 1=fingers-closed. Bit 1 is the "fingers open" switch, with 0=fingers-open and 1=fingers-not-open. This translates to the 4 states in the valid values list.*	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Articulation_Device_Parameters[2]/device_mode**	
			ASCII_Short_String_Collapsed

geom:**device_name** *GRAPPLE_ARTICULATION_STATE.**ARTICULATION_DEVICE_NAME***	The device_name attribute specifies the common name of an articulation device.	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Articulation_Device_Parameters[1]/device_name** **2) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Articulation_Device_Parameters[2]/device_name**	
			ASCII_Short_String_Collapsed
geom:**device_phase** *GRAPPLE_ARTICULATION_STATE.**ARTICULATION_DEVICE_PHASE***	The device_phase attribute specifies the current phase of the mission, from an articulation-device-centric point of view. **InSight Specific:** *Current mission phase from a grapple-centric perspective. This affects whether the IDA_OPEN_GRAPPLE command is accepted (only in OK_TO_OPEN phase), and the assumed force on the end of the arm (based on which instrument the phase says is grappled) during arm deflection computation. Only human operators (via spacecraft command) can change this value.*	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Articulation_Device_Parameters[2]/device_phase**	
			ASCII_Short_String_Collapsed
img:**sample_fov** *INSTRUMENT_STATE_PARMS.**AZIMUTH_FOV*** *INSTRUMENT_STATE_PARMS.**AZIMUTH_FOV__UNIT***	The sample_fov attribute specifies the angular measure of the field of view of an imaged scene, as measured in the image sample direction (generally horizontal). **InSight Specific:** *Computed by projecting rays from the left and right edges of the image at the center through the camera model, and computing the angle subtended by those rays.*	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Imaging_Instrument_State_Parameters/sample_fov**	
			ASCII_Real *Units_of_Angle*
img:**bayer_algorithm** *INSTRUMENT_STATE_PARMS.**BAYER_METHOD***	The bayer_algorithm specifies the algorithm used to remove the Bayer pattern in order to create color.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Color_Filter_Array_Parameters/bayer_algorithm**	
		1) None 2) Raw Bayer 3) Malvar 4) Zhang-Wu 5) Red Averaged 6) Green Averaged 7) Blue Averaged 8) Red Bilinear 9) Green Bilinear 10) Blue Bilinear 11) Averaged 12) Bilinear	ASCII_Short_String_Collapsed

		13) Panchromatic 14) Identity	
img:**color_filter_array_type** *INSTRUMENT_STATE_PARMS.**CFA_TYPE***	Defines the type of Color Filter Array (CFA) used to encode multiple colors in a single exposure. The most common example of this is the Bayer pattern. This is optional if there is no CFA. Additional attributes, specific to each CFA type, define whether or not the CFA pattern has been removed, and if so, how (e.g. bayer_algorithm).	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Color_Filter_Array_Parameters/color_filter_array_type**	
		1) Bayer RGGB	ASCII_Short_String_Collapsed
img:**color_filter_array_venue** *INSTRUMENT_STATE_PARMS.**CFA_VENUE***	For instruments using a Color Filter Array (CFA) (such as the Bayer pattern), this attribute defines where the CFA pattern was removed from the data. It is optional if there is no CFA. Valid values: 'Onboard', 'Ground', 'None'. In the case of instruments using the Bayer pattern, use the bayer_algorithm to specify the algorithm used to remove the pattern.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Color_Filter_Array_Parameters/color_filter_array_venue**	
		1) Onboard 2) Ground 3) None	ASCII_Short_String_Collapsed
img:**color_space** *DERIVED_IMAGE_PARMS.**COLOR_SPACE***	Defines the color space in which this product is expressed. Some color spaces (e.g. XYZ or xyY) are independent of illuminant, while for others (e.g. sRGB or pRGB) the illuminant matters. It is expected that the defined color spaces will increase over time.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Color_Parameters/color_space**	
		1) iRGB 2) sRGB 3) pRGB 4) wRGB 5) CIE_XYZ 6) CIE_xyY 7) HSI	ASCII_Short_String_Collapsed
geom:**coordinate_space_frame_type** *ARM_COORDINATE_SYSTEM.**COORDINATE_SYSTEM_NAME***	The coordinate_space_frame_type attribute identifies the type of frame being described, such as SITE, LOCAL_LEVEL, LANDER, ROVER, ARM, etc. When combined with Coordinate_Space_Index and the optional solution_id in the Coordinate_Space_Indexed class, this serves to fully name an instance of a coordinate space.	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Coordinate_Space_Definition[1]/Coordinate_Space_Present/Coordinate_Space_Indexed/coordinate_space_frame_type** **2) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Coordinate_Space_Definition[1]/Coordinate_Space_Reference/Coordinate_Space_Indexed/coordinate_space_frame_type** **3) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Coordinate_Space_Definition[2]/Coordinate_Spa**	

		ce_Present/Coordinate_Space_Indexed/coordinate_space_frame_type **4) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Derived_Geometry[2]/Coordinate_Space_Reference/Coordinate_Space_Indexed/coordinate_space_frame_type**	
			ASCII_Short_String_Collapsed
img_surface:**derived_image_type_name** *DERIVED_IMAGE_PARMS.**DERIVED_IMAGE_TYPE***	The derived_image_type_name attribute specifies how to interpret the pixel values in a derived image (or colloquially, the type of the derived image itself). Valid values vary per mission depending on the products produced. **InSight Specific:** *Additional types may be added throughout the mission. See the SIS for a table of current valid values.*	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Imaging_Parameters/Derived_Product_Parameters/derived_image_type_name**	
			ASCII_Short_String_Collapsed
img:**detector_erase_count** *OBSERVATION_REQUEST_PARMS.**DETECTOR_ERASE_COUNT***	The detector_erase_count specifies the number of times a detector has been or will be flushed of data in raw counts, dependent on the parent class for the attribute. **InSight Specific:** *Number of fast flushes*	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Command_Parameters/detector_erase_count**	
			ASCII_NonNegative_Integer
img:**detector_to_image_rotation** *INSTRUMENT_STATE_PARMS.**DETECTOR_TO_IMAGE_ROTATION***	The detector_to_image_rotation attribute specifies the clockwise rotation, in degrees, that was applied to an image along its optical path through an instrument, from detector to final image orientation. **InSight Specific:** *The IDC EDR is rotated 270 degrees, so the arm/grapple is at the top of the image. The ICC requires no rotation.*	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Imaging_Instrument_State_Parameters/detector_to_image_rotation**	
			ASCII_Real *Units_of_Angle*
msn_surface:**download_priority** *TELEMETRY.**DOWNLOAD_PRIORITY***	The download_priority attribute specifies which data to downlink/transmit, based on order of importance. The lower numerical priority (higher-ranked number) data products are transmitted before higher numerical priority (lower-ranked number) data products. For example, an image with a downlink priority of 1 will be transmitted before an image with a downlink priority of 6. Value of 0 specifies use of on-board default. **InSight Specific:** *Values are 1-6 for InSight.*	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Mission_Parameters/Telemetry_Information/download_priority**	
			ASCII_NonNegative_Integer
		1) /Product_Observational/Observation_Area/Mission_Area/Surface_Mi	

msn_surface:**earth_received_start_date_time** *TELEMETRY.**EARTH_RECEIVED_START_TIME***	The earth_received_start_date_time attribute provides the earliest time at which any component telemetry data for a particular product was received.	**ssion_Parameters/Telemetry_Information/earth_received_start_date_time**	
			ASCII_Date_Time_YMD_UTC
msn_surface:**earth_received_stop_date_time** *TELEMETRY.**EARTH_RECEIVED_STOP_TIME***	The earth_received_stop_date_time attribute provides the latest time at which any component telemetry data for a particular product was received.	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Mission_Parameters/Telemetry_Information/earth_received_stop_date_time**	
			ASCII_Date_Time_YMD_UTC
img:**line_fov** *INSTRUMENT_STATE_PARMS.**ELEVATION_FOV*** *INSTRUMENT_STATE_PARMS.**ELEVATION_FOV__UNIT***	The line_fov attribute specifies the angular measure of the field of view of an imaged scene, as measured in the image line direction (generally vertical). **InSight Specific:** *Computed by projecting rays from the top and bottom edges of the image at the center through the camera model, and computing the angle subtended by those rays.*	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Imaging_Instrument_State_Parameters/line_fov**	
			ASCII_Real *Units_of_Angle*
img:**encoded_display_gamma** *DERIVED_IMAGE_PARMS.**ENCODED_DISPLAY_GAMMA***	Defines the gamma value encoded in this image. Gamma correction is used to nonlinearly compress the intensities in an image, and most display systems assume that images are encoded with an sRGB gamma. Note that this is a string value because the most common gamma correction ("sRGB") is not precisely expressible as a gamma exponent. A numeric value indicates a gamma exponent.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Color_Parameters/encoded_display_gamma**	
			ASCII_Short_String_Collapsed
img_surface:**error_model_name** *DERIVED_IMAGE_PARMS.**ERROR_MODEL_NAME***	The error_model_name attribute specifies the method or algorithm used to create the error estimate. Each mission will define their own set of possible values. Algorithms will be added over time. The initial value is MIPL_CONST_DISPARITY_PROJECTED_V1, which means an arbitrary constant disparity error is assumed (in ERROR_MODEL_PARMS), which is projected through the camera models to approximate an error ellipse, which is then projected to the XYZ or range/crossrange axes depending on the file type.	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Imaging_Parameters/Error_Model_Information/error_model_name**	
			ASCII_Short_String_Collapsed
msn_surface:**expected_packets** *TELEMETRY.**EXPECTED_PACKETS***	The expected_packets attribute provides the total number of telemetry packets which constitute a complete data product, i.e., a data product without missing data.	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Mission_Parameters/Telemetry_Information/expected_packets**	
			ASCII_NonNegative_Integer

img:**exposure_count** *INSTRUMENT_STATE_PARMS.**EXPOSURE_COUNT***	The exposure count attribute provides the number of exposures taken during a certain interval, such as the duration of one command. For example, this may include the number of exposures needed by an autoexpose algorithm. **InSight Specific:** *Actual number of auto exposure iterations*	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Exposure_Parameters/exposure_count**	
			ASCII_NonNegative_Integer
img:**exposure_duration** *INSTRUMENT_STATE_PARMS.**EXPOSURE_DURATION*** *INSTRUMENT_STATE_PARMS.**EXPOSURE_DURATION__UNIT***	The exposure_duration attribute provides the amount of time the instrument sensor was gathering light from the scene, such as between opening and closing of a shutter, or between flushing and readout of a CCD.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Exposure_Parameters/exposure_duration**	
			ASCII_Real *Units_of_Time*
img:**exposure_duration_count** *OBSERVATION_REQUEST_PARMS.**EXPOSURE_DURATION_COUNT***	The exposure_duration_count attribute specifies the value, in raw counts, for the amount of time the instrument sensor was gathering light from the scene, such as between opening and closing of a shutter, or between flushing and readout of a CCD. This is the raw count either commanded or taken directly from telemetry as reported by the spacecraft. This attribute is the same as the exposure_duration but in DN counts versus time, and the translation of exposure_duration_count to exposure_duration will differ by mission. The attribute can be specified in the context of both Imaging_Instrument_State_Parameters (actual value) and Command_Parameters (commanded value). Both commanded and actual because it's possible for the actual to not match the commanded. For example the exposure might fault out early, or there might be a deadband (for example, pointing backlash) where changes in the input do not actually affect the output.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Command_Parameters/Exposure_Parameters/exposure_duration_count** **2) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Exposure_Parameters/exposure_duration_count**	
			ASCII_NonNegative_Integer
img:**exposure_type** *OBSERVATION_REQUEST_PARMS.**EXPOSURE_TYPE***	The exposure_type attribute indicates the exposure setting on a camera. Valid values: 'Manual' - manual exposure setting, 'Auto' - autoexposure is applied by the camera, 'Test' - test exposure setting telling the camera to return a fixed-pattern test image.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Command_Parameters/Exposure_Parameters/exposure_type**	
		1) Manual 2) Auto 3) Test	ASCII_Short_String_Collapsed
img:**first_line** *IMAGE_DATA.**FIRST_LINE***	The first_line attribute indicates the line within a source image that corresponds to the first line in a sub-image. **InSight Specific:** *InSight does not support subframing, so this value is always 1.*	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Subframe_Parameters/first_line**	
			ASCII_NonNegative_Integer

img:**first_sample** *IMAGE_DATA.**FIRST_LINE_SAMPLE***	The first_sample attribute indicates the sample within a source image that corresponds to the first sample in a sub-image. **InSight Specific:** *InSight does not support subframing, so this value is always 1.*	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Subframe_Parameters/first_sample**	
			ASCII_NonNegative_Integer
msn_surface:**flight_software_version_id** *TELEMETRY.**FLIGHT_SOFTWARE_VERSION_ID***	The flight_software_version_id attribute identifies the version of the instrument flight software used to acquire the image.	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Mission_Parameters/Telemetry_Information/flight_software_version_id**	
			ASCII_Short_String_Collapsed
img:**frame_id** *IDENTIFICATION.**FRAME_ID***	The frame_id attribute specifies an identification for a particular instrument measurement frame. A frame consists of a sequence of measurements made over a specified time interval, and may include measurements from different instrument modes. These sequences repeat from cycle to cycle and sometimes within a cycle. **InSight Specific:** *Used to denote the commanded camera eye for stereo. InSight has no stereo camera but the IDC is commanded with some images marked "left" and "right" for ease of stereo processing. Note that any given image can be used either as a left or right eye image in special processing; this value reflects only the commanded intent (via IMAGE_ID).*	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Frame_Parameters/frame_id**	
			ASCII_Short_String_Collapsed
img:**frame_type_name** *IDENTIFICATION.**FRAME_TYPE***	The frame_type_name attribute specifies whether the image was commanded as part of a stereo pair or as a single left or right monoscopic image. If frame_type = 'Stereo', a left and a right image should be present.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Frame_Parameters/frame_type_name**	
			ASCII_Short_String_Collapsed
img_surface:**geometry_projection_type** *IDENTIFICATION.**GEOMETRY_PROJECTION_TYPE***	The geometry_projection_type attribute specifies how pixels in a file have been reprojected to correct for camera distortion, linearization, or rubber-sheeting (it is not the intent of this field to capture map projections). "Raw" indicates no projection has been done. **InSight Specific:** *RAW means the image uses a CAHVOR or one of the CAHVORE camera models. LINEARIZED means that reprojection has been performed to linearize the camera model (thus removing things like lens distortion). This means the image uses a CAHV camera model.*	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Imaging_Parameters/Geometry_Projection_Parameters/geometry_projection_type**	
		1) Raw 2) Linearized	ASCII_Short_String_Collapsed
msn_surface:**surface_gravity**	The surface_gravity attribute specifies the acceleration of gravity (magnitude, not direction).	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Mission_Parameters/surface_gravity**	

*ARM_ARTICULATION_STATE.**GRAVITY_ACCELERATION***			ASCII_Real *Units_of_Acceleration*
img:**illuminant** *DERIVED_IMAGE_PARMS.**ILLUMINANT***	Defines the illuminant that was used in order to process this image. The valid values are open-ended but currently used values include: None, 5000K.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Color_Parameters/illuminant**	
		1) NONE 2) 5000K 3) null	ASCII_Short_String_Collapsed
msn_surface:**data_size** *TELEMETRY.**IMAGE_DATA_SIZE***	The data_size specifies number of bytes in the compressed data stream, not including headers.	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Mission_Parameters/Telemetry_Information/data_size**	
			ASCII_NonNegative_Integer
img_surface:**image_id** *IDENTIFICATION.**IMAGE_ID***	The image_id is an arbitrary string identifier that is associated with this image. The specific interpretation of it is mission-dependent, and it need not be unique to this image. For example, missions may use it as an image counter, a round-trip token indicating how to process the image, or a FSW-assigned value identifying the image. **InSight Specific:** *The image_id is a 32-bit integer token set in the command sent from the ground, and returned in the image telemetry.Â It contains five subfields, each of which has its own label attributes: sequence_id, mesh_id, mosaic_id, stereo_id, and camera eye (frame_id). See each attribute for its usage.Â Note that image_id values are not unique (multiple images may share the same ID).*	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Imaging_Parameters/Image_Identifiers/image_id**	
			ASCII_Short_String_Collapsed
img_surface:**image_type** *IDENTIFICATION.**IMAGE_TYPE***	The image_type attribute specifies the type of image acquired. The intent is to distinguish between different kinds of image-related data that may differ in how they are interpreted. Some types are not standard images, but they are stored in an image structure. Examples include Regular, Thumbnail, Reference Pixels, Histogram, Row Sum, and Column Sum.	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Imaging_Parameters/Instrument_Information/image_type**	
		1) REGULAR 2) THUMBNAIL 3) REF_PIXELS 4) HISTOGRAM 5) ROW_SUM 6) COL_SUM 7) SPECTRA 8) HEALTH	ASCII_Short_String_Collapsed

img:**color_subsampling_mode** *COMPRESSION.**INST_CMPRS_COLOR_MODE***	The color_subsampling_mode attribute specifies the JPEG color subsampling mode used during compression. Valid values: '4:2:2' - 4:2:2 chroma subsampling, which is the typical case, '4:4:4' - 4:4:4 chroma sampling, which indicates no subsampling, 'Grayscale' - indicates a grayscale image **InSight Specific:** *Note that the VICAR valid values are different from PDS 4 but mean the same: COLOR_MODE_GRAY, COLOR_MODE_422, COLOR_MODE_444*	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Compression_Parameters/JPEG_Parameters/color_subsampling_mode**	
		1) 4:4:4 2) 4:2:2 3) Grayscale	ASCII_Short_String_Collapsed
img:**compression_type** *COMPRESSION_PARMS.**INST_CMPRS_NAME***	The compression_type attribute identifies the type of on-board compression used for data storage and transmission. Valid Values: 'ICER', 'LOCO', 'JPEG', 'JPEG Progressive', 'MSSS Lossless', 'None'.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Compression_Parameters/compression_type**	
		1) ICER 2) ICT 3) LOCO 4) JPEG 5) JPEG Progressive 6) MSSS Lossless 7) None	ASCII_Short_String_Collapsed
img:**jpeg_quality** *COMPRESSION.**INST_CMPRS_QUALITY***	The jpeg_quality attribute is a JPEG specific variable which identifies the resultant or targeted image quality index for on-board data compression.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Compression_Parameters/JPEG_Parameters/jpeg_quality**	
			ASCII_NonNegative_Integer
img:**compression_rate** *COMPRESSION.**INST_CMPRS_RATE***	The compression_rate attribute provides the average number of bits needed to represent a pixel for an on-board compressed image. **InSight Specific:** *Represents actual results (not commanded value)*	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Compression_Parameters/compression_rate**	
			ASCII_Real
img:**compression_ratio** *COMPRESSION.**INST_CMPRS_RATIO***	The compression_ratio attribute provides the ratio of the size, in bytes, of the original uncompressed data object to its compressed form (original size / compressed size). **InSight Specific:** *Represents actual results (not commanded value)*	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Compression_Parameters/compression_ratio**	
			ASCII_Real
geom:**instrument_azimuth** *SITE_DERIVED_GEOMETRY_PARMS.**INSTRUMENT_AZIMUTH*** *SITE_DERIVED_GEOMETRY_PARMS.**INSTRUMENT_AZ***	The instrument_azimuth attribute specifies the value for an instrument's rotation in the horizontal direction. It is usually measured from a low hard stop. Although it may be used for any instrument where it makes sense, it is primarily intended for use in surface-based instruments that measure pointing in terms of azimuth and elevation. When in a group, defines the azimuth (horizontal rotation) at which the instrument is	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Derived_Geometry[1]/instrument_azimuth** **2) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Derived_Geometry[2]/instrument_azimuth**	

IMUTH__UNIT	pointed. This value is expressed using the coordinate system referred to by Coordinate_Space_Reference class. The interpretation of exactly what part of the instrument is being pointed is mission-specific. It could be the boresight, the camera head direction, the CAHV camera model A vector direction, or any of a number of other things. As such, for multimission use this value should be used mostly as an approximation, e.g. identifying scenes which might contain a given object. **InSight Specific:** *The interpretation is the boresight of the camera, defined as projecting the center of the nominal image (before downsampling or subframing) through the camera model. Azimuth is measured in Site frame.*		ASCII_Real *Units_of_Angle*
geom:**instrument_elevation** *SITE_DERIVED_GEOMETRY_PARMS.**INSTRUMENT_ELEVATION*** *SITE_DERIVED_GEOMETRY_PARMS.**INSTRUMENT_ELEVATION__UNIT***	The instrument_elevation attribute specifies the value for an instrument's rotation in the vertical direction. It is usually measured from a low hard stop. Although it may be used for any instrument where it makes sense, it is primarily intended for use in surface-based instruments that measure pointing in terms of azimuth and elevation. When in a group, defines the elevation (vertical rotation) at which the instrument is pointed. This value is expressed using the coordinate system referred to by Coordinate_Space_Reference class. The interpretation of exactly what part of the instrument is being pointed is mission-specific. It could be the boresight, the camera head direction, the CAHV camera model A vector direction, or any of a number of other things. As such, for multimission use this value should be used mostly as an approximation, e.g. identifying scenes that might contain a given object. **InSight Specific:** *The interpretation is the boresight of the camera, defined as projecting the center of the nominal image (before downsampling or subframing) through the camera model. Elevation is measured in Site frame.*	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Derived_Geometry[1]/instrument_elevation** **2) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Derived_Geometry[2]/instrument_elevation**	
		ASCII_Real *Units_of_Angle*
lid_reference *IDENTIFICATION.**INSTRUMENT_ID***	The lid_reference attribute provides the logical_identifier for a product.	**1) /Product_Observational/Observation_Area/Investigation_Area/Internal_Reference/lid_reference** **2) /Product_Observational/Observation_Area/Observing_System/Observing_System_Component[1]/Internal_Reference/lid_reference**	

		3) **/Product_Observational/Observation_Area/Observing_System/Observing_System_Component[2]/Internal_Reference/lid_reference** **4)** **/Product_Observational/Observation_Area/Target_Identification/Internal_Reference/lid_reference** **5)** **/Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Data_Correction_Parameters/Data_Correction[3]/Data_Correction_File/Internal_Reference/lid_reference** **6)** **/Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Input_Product_List/Input_Product/Internal_Reference/lid_reference**	
			ASCII_LID
img_surface:**instrument_mode_id** *INSTRUMENT_STATE_PARMS.**INSTRUMENT_MODE_ID***	The instrument_mode_id attribute provides an instrument-dependent designation of operating mode. This may be simply a number, letter or code, or a word such as 'normal', 'full resolution', 'near encounter', or 'fixed grating'. These types may vary by mission so the permissible values should be set by the mission dictionaries.	**1)** **/Product_Observational/Observation_Area/Mission_Area/Surface_Imaging_Parameters/Instrument_Information/instrument_mode_id**	
			ASCII_Short_String_Collapsed
img_surface:**instrument_serial_number** *IDENTIFICATION.**INSTRUMENT_SERIAL_NUMBER***	The instrument serial number element provides the manufacturer's serial number assigned to an instrument. This number may be used to uniquely identify a particular instrument for tracing its components or determining its calibration history, for example.	**1)** **/Product_Observational/Observation_Area/Mission_Area/Surface_Imaging_Parameters/Instrument_Information/instrument_serial_number**	
			ASCII_Short_String_Collapsed
img:**temperature_value** *INSTRUMENT_STATE_PARMS.**INSTRUMENT_TEMPERATURE*** *INSTRUMENT_STATE_PARMS.**INSTRUMENT_TEMPERATURE__UNIT***	The temperature_value attribute provides the temperature, in the specified units, of some point on an imaging instrument or other imaging instrument device.	**1)** **/Product_Observational/Observation_Area/Discipline_Area/Imaging/Imaging_Instrument_State_Parameters/Instrument_Device_Temperature/Instrument_Device_Temperature_Index[1]/temperature_value** **2)** **/Product_Observational/Observation_Area/Discipline_Area/Imaging/Imaging_Instrument_State_Parameters/Instrument_Device_Temperature/Instrument_Device_Temperature_Index[2]/temperature_value**	

			ASCII_Real *Units_of_Temperature*
img:**device_name** *INSTRUMENT_STATE_PARMS.**INSTRUMENT_TEMPERATURE_NAME***	The device_name attribute supplies the formal name for an imaging instrument, an imaging instrument device, or some point on the instrument or device.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Imaging_Instrument_State_Parameters/Instrument_Device_Temperature/Instrument_Device_Temperature_Index[1]/device_name** **2) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Imaging_Instrument_State_Parameters/Instrument_Device_Temperature/Instrument_Device_Temperature_Index[2]/device_name**	
			ASCII_Short_String_Collapsed
img_surface:**instrument_version_number** *IDENTIFICATION.**INSTRUMENT_VERSION_ID***	The instrument_version_number element identifies the specific model of an instrument used to obtain data. For example, this keyword could be used to distinguish between an engineering model of a camera used to acquire test data, and a flight model of a camera used to acquire science data during a mission.	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Imaging_Parameters/Instrument_Information/instrument_version_number**	
			ASCII_Short_String_Collapsed
invalid_constant *IMAGE_DATA.**INVALID_CONSTANT***	The invalid_constant attribute provides a value that indicates the original value was outside the valid range for the parameter. **InSight Specific:** *The value should be 0.0 for most MIPL-generated products.*	**1) /Product_Observational/File_Area_Observational/Array_3D_Image/Special_Constants/invalid_constant**	
			ASCII_Short_String_Collapsed
cart:**line** *SURFACE_PROJECTION_PARMS.**LINE_PROJECTION_OFFSET***	The line attribute specifies the line number in the image.	**1) /Product_Observational/Observation_Area/Discipline_Area/Cartography/Spatial_Reference_Information/Horizontal_Coordinate_System_Definition/Local/Map_Projection_Lander/Orthorectified/Pixel_Position_Origin/line**	
			ASCII_Real
img:**samples** *IMAGE_DATA.**LINE_SAMPLES***	The samples attribute indicates the total number of data instances along the horizontal axis of an image or sub-image.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Subframe_Parameters/samples**	
			ASCII_NonNegative_Integer
		1) /Product_Observational/Observation_Area/Mission_Area/Surface_Im	

img_surface:**linearization_mode** *DERIVED_IMAGE_PARMS.**LINEARIZATION_MODE***	The linearization_mode attribute specifies what kind of stereo partner was used to linearize the image (the process requires two camera models).	**aging_Parameters/Geometry_Projection_Parameters/linearization_mode**	
		1) Nominal 2) Actual 3) None	ASCII_Short_String_Collapsed
img_surface:**linearization_mode_fov** *DERIVED_IMAGE_PARMS.**LINEARIZATION_MODE***	The linearization_mode_fov attribute specifies how the linearized camera model's field of view (FOV) as constructed (corresponding to the "cahv_fov" parameter in MIPL software).	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Imaging_Parameters/Geometry_Projection_Parameters/linearization_mode_fov**	
		1) Minimum 2) Maximum 3) Linear 4) None	ASCII_Short_String_Collapsed
img:**lines** *IMAGE_DATA.**LINES***	The lines attribute indicates the total number of data instances along the vertical axis of an image or sub-image.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Subframe_Parameters/lines**	
			ASCII_NonNegative_Integer
local_mean_solar_time *IDENTIFICATION.**LOCAL_MEAN_SOLAR_TIME***	The local_mean_solar_time attribute provides the hour angle of the fictitious mean Sun at a fixed point on a rotating solar system body. **InSight Specific:** *The valid value is embedded with a Sol value that can be different than the Sol (see PLANET_DAY_NUMBER) associated with LTST (see LOCAL_TRUE_SOLAR_TIME). The time portion of the valid value is expressed in terms of a 24-hour clock. So, in an example using Sol 27, the valid value range for the 24-hour clock would be represented as 00027M00:00:00.000 to 00027M23:59:59.999.*	**1) /Product_Observational/Observation_Area/Time_Coordinates/local_mean_solar_time**	
			ASCII_Short_String_Collapsed
local_true_solar_time *IDENTIFICATION.**LOCAL_TRUE_SOLAR_TIME***	The local_true_solar_time (LTST) attribute provides the local time on a rotating solar system body where LTST is 12 h at the sub-solar point (SSP) and increases 1 h for each 15 degree increase in east longitude away from the SSP for prograde rotation. **InSight Specific:** *The valid value is expressed in terms of a 24-hour clock, so the acceptable range is 00:00:00.000 to 23:59:59.999. See also LOCAL_TRUE_SOLAR_TIME_SOL for the sol number.*	**1) /Product_Observational/Observation_Area/Time_Coordinates/local_true_solar_time**	
			ASCII_Short_String_Collapsed
	The start_local_true_solar_time_sol element specifies the number of solar days elapsed since a reference day (e.g. the	**1) /Product_Observational/Observation_Area/Mission_Area/Mission_Inf**	

msn:**start_local_true_solar_time_sol** *IDENTIFICATION.**LOCAL_TRUE_SOLAR_TIME_SOL***	day on which a landing vehicle set down) for local true solar time (LTST). Days are measured in rotations of the planet in question from midnight to midnight. The reference day is '0', as Landing day is Sol 0. If before Landing day, then value will be less than or equal to '0'and can be negative. **InSight Specific:** *The reference day is 0, as Landing day is Sol 0. If before Landing day, then value will be less than or equal to 0 and can be negative.*	**ormation/Surface_Mission_Information/start_local_true_solar_time_sol**	
			ASCII_Integer
img_surface:**mesh_id** *IDENTIFICATION.**MESH_ID***	The mesh_id attribute specifies which terrain mesh this image should be automatically included in. This does not constrain which mesh(es) the image may be included in outside a pipeline environment. **InSight Specific:** *Value is extracted from the image_id attributes value. Meshes combine images with matching mesh_id, sequence_id, and Epoch values. A mesh_id of 0 means do not include in a mesh. Values 1-9 mean to match within the same Sol only. Values 10-63 match globally across the entire mission. For non-raw products, any two characters, including non-numeric characters, may be used.*	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Imaging_Parameters/Image_Identifiers/mesh_id**	
			ASCII_Short_String_Collapsed
missing_constant *IMAGE_DATA.**MISSING_CONSTANT***	The missing_constant attribute provides a value that indicates the original value was missing, such as due to a gap in coverage. **InSight Specific:** *The value should be 0.0 for most MIPL-generated products.*	**1) /Product_Observational/File_Area_Observational/Array_3D_Image/Special_Constants/missing_constant**	
			ASCII_Short_String_Collapsed
msn:**mission_phase_name** *IDENTIFICATION.**MISSION_PHASE_NAME***	The mission_phase_name attribute provides the commonly recognized name for a mission phase.	**1) /Product_Observational/Observation_Area/Mission_Area/Mission_Information/mission_phase_name**	
			ASCII_Short_String_Collapsed
geom:**model_type** *GEOMETRIC_CAMERA_MODEL.**MODEL_TYPE***	The model_type attribute specifies an identifier for the type or kind of model. The value should be one of a well defined set, providing an application program with sufficient information to know how to handle the rest of the parameters within the model. This value will correlate directly with the specific camera model class that is a subclass of the Camera_Model_Parameters class.	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Camera_Model_Parameters/model_type**	
			ASCII_Short_String_Collapsed
img_surface:**mosaic_id**	The mosaic_id attribute specifies which mosaic this image should be automatically included in. This does not constrain which mosaic(s) the image may be included in outside a	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Imaging_Parameters/Image_Identifiers/mosaic_id**	

*IDENTIFICATION.**MOSAIC_ID***	pipeline environment. **InSight Specific:** *For InSight, value is extracted from the image_id value. Mosaics combine iages with matching mosaic_id, sequence_id, and Epoch values. A mosaic_id of0 means do not include in a mesh. Values 1-9 mean to match within the same Sol only. Values 10-63 match globally across the entire mission. For non-raw products, any two characters, including non-numeric characters, may be used.*		ASCII_Short_String_Collapsed
img:**analog_offset** *INSTRUMENT_STATE_PARMS.**OFFSET_MODE_ID***	The analog_offset attribute identifies the analog value that is subtracted from the signal prior to the analog/digital conversion. **InSight Specific:** *This value is the video offset, and has a range 0-4095.*	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Imaging_Instrument_State_Parameters/analog_offset**	
			ASCII_Integer
img:**responsivity_r** *INSTRUMENT_STATE_PARMS.**ONBOARD_RESPONSIVITY***	Specifies the factor that has been applied to the R cell of the Bayer pattern, before de-Bayering (demosaicking) takes place.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Color_Parameters/Onboard_Responsivity/responsivity_r**	
			ASCII_Real
img:**responsivity_g** *INSTRUMENT_STATE_PARMS.**ONBOARD_RESPONSIVITY***	Specifies the factor that has been applied to the G cell of the Bayer pattern, before de-Bayering (demosaicking) takes place.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Color_Parameters/Onboard_Responsivity/responsivity_g**	
			ASCII_Real
img:**responsivity_b** *INSTRUMENT_STATE_PARMS.**ONBOARD_RESPONSIVITY***	Specifies the factor that has been applied to the B cell of the Bayer pattern, before de-Bayering (demosaicking) takes place.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Color_Parameters/Onboard_Responsivity/responsivity_b**	
			ASCII_Real
img:**height_pixels** *INSTRUMENT_STATE_PARMS.**PIXEL_AVERAGING_HEIGHT***	The height_pixels attribute provides the vertical dimension, in pixels. **InSight Specific:** *InSight does not support downsampling, so this value is always 1.*	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Downsampling_Parameters/Pixel_Averaging_Dimensions/height_pixels**	
			ASCII_NonNegative_Integer *Units_of_Misc*

img:**width_pixels** *INSTRUMENT_STATE_PARMS.**PIXEL_AVERAGING_WIDTH***	The width_pixels attribute provides the horizontal dimension, in pixels. **InSight Specific:** *InSight does not support downsampling, so this value is always 1.*	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Downsampling_Parameters/Pixel_Averaging_Dimensions/width_pixels**	
			ASCII_NonNegative_Integer *Units_of_Misc*
msn:**start_sol_number** *IDENTIFICATION.**PLANET_DAY_NUMBER***	The start_sol_number is the number of the Mars day on which an observation began. Landing day is Sol 0.	**1) /Product_Observational/Observation_Area/Mission_Area/Mission_Information/Surface_Mission_Information/start_sol_number**	
			ASCII_Integer
geom:**positive_azimuth_direction** *LANDER_COORDINATE_SYSTEM.**POSITIVE_AZIMUTH_DIRECTION***	The positive_azimuth_direction attribute specifies the direction in which azimuth is measured in positive degrees for an observer on the surface of a body. The azimuth is measured with respect to the elevation reference plane. A value of 'clockwise' indicates that azimuth is measured positively clockwise, and 'counterclockwise' indicates that azimuth increases positively counter-clockwise. **InSight Specific:** *For operational coordinate frames, which follow the Mars Pathfinder convention, increasing azimuth moves in a clockwise (CLOCKWISE) direction as viewed from above.*	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Coordinate_Space_Definition[1]/positive_azimuth_direction** **2) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Coordinate_Space_Definition[2]/positive_azimuth_direction**	
		1) Clockwise 2) Counterclockwise 3) CW 4) CCW	ASCII_Short_String_Collapsed
geom:**positive_elevation_direction** *LANDER_COORDINATE_SYSTEM.**POSITIVE_ELEVATION_DIRECTION***	The positive_elevation_direction attribute provides the direction in which elevation is measured in positive degrees for an observer on the surface of a body. The elevation is measured with respect to the azimuthal reference plane. A value of UP or ZENITH indicates that elevation is measured positively upwards, i.e., the zenith point would be at +90 degrees and the nadir point at -90 degrees. DOWN or NADIR indicates that the elevation is measured positively downwards; the zenith point would be at -90 degrees and the nadir point at +90 degrees. **InSight Specific:** *For operational coordinate frames, which follow the Mars Pathfinder convention, the positive elevation direction is UP.*	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Coordinate_Space_Definition[1]/positive_elevation_direction** **2) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Coordinate_Space_Definition[2]/positive_elevation_direction**	
		1) Up 2) Zenith 3) Down 4) Nadir	ASCII_Short_String_Collapsed

msn_surface:**product_completion_status** *TELEMETRY.**PRODUCT_COMPLETION_STATUS***	The product_completion_status attribute indicates whether or not a product is complete or is in one of a number of incomplete states. Sample values might indicate that all portions of the product have been downlinked and received correctly, that all portions have not yet been received, or that the product contains transmission errors. The specific values are mission-dependent.	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Mission_Parameters/Telemetry_Information/product_completion_status**	
		1) PARTIAL 2) COMPLETE	ASCII_Short_String_Collapsed
creation_date_time *IDENTIFICATION.**PRODUCT_CREATION_TIME***	The creation_date_time attribute provides a date and time when the object was created. **InSight Specific:** *This represents the Earth time when the product was created, not the time the spacecraft acquired the data.*	**1) /Product_Observational/File_Area_Observational/File/creation_date_time**	
			ASCII_Date_Time_YMD
alternate_id *IDENTIFICATION.**PRODUCT_ID***	The alternate_id attribute provides an additional identifier supplied by the data provider. **InSight Specific:** *This is the filename minus the extension (including the version number).*	**1) /Product_Observational/Identification_Area/Alias_List/Alias/alternate_id**	
			ASCII_Short_String_Collapsed
file_name *IDENTIFICATION.**PRODUCT_ID***	The file_name attribute provides the name of a file. **InSight Specific:** *This is the filename minus the extension (including the version number).*	**1) /Product_Observational/File_Area_Observational/File/file_name**	
			ASCII_Short_String_Collapsed
value_offset *DERIVED_IMAGE_PARMS.**RADIANCE_OFFSET***	The value_offset attribute is the offset to be applied to each stored value in order to recover an original value. The observed value (Ov) is calculated from the stored value (Sv) thus: Ov = (Sv * scaling_factor) + value_offset. The default value is 0.	**1) /Product_Observational/File_Area_Observational/Array_3D_Image/Element_Array/value_offset**	
			ASCII_Real
unit *DERIVED_IMAGE_PARMS.**RADIANCE_OFFSET__UNIT*** *DERIVED_IMAGE_PARMS.**RADIANCE_SCALING_FACTOR__UNIT***	The unit attribute provides the unit of measurement.	**1) /Product_Observational/File_Area_Observational/Array_3D_Image/Element_Array/unit**	
			UTF8_Short_String_Collapsed
scaling_factor *DERIVED_IMAGE_PARMS.**RADIANCE_SCALING_FACTOR***	The scaling_factor attribute is the scaling factor to be applied to each stored value in order to recover an original value. The observed value (Ov) is calculated from the stored value (Sv) thus: Ov = (Sv * scaling_factor) + value_offset. The default value is 1.	**1) /Product_Observational/File_Area_Observational/Array_3D_Image/Element_Array/scaling_factor**	
			ASCII_Real

img:**radiometric_correction_type_name** *DERIVED_IMAGE_PARMS.**RADIOMETRIC_CORRECTION_TYPE***	The radiometric_correction_type_name identifies the method used for radiometric correction.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Data_Correction_Parameters/Data_Correction[2]/Radiometric_Correction_Parameters/radiometric_correction_type_name**	
			ASCII_Short_String_Collapsed
img_surface:**x_position** *DERIVED_IMAGE_PARMS.**RANGE_ORIGIN_VECTOR***	The x component of a Cartesian position vector.	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Imaging_Parameters/Derived_Product_Parameters/Vector_Range_Origin/x_position**	
			ASCII_Real *Units_of_Length*
img_surface:**y_position** *DERIVED_IMAGE_PARMS.**RANGE_ORIGIN_VECTOR***	The y component of a Cartesian position vector.	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Imaging_Parameters/Derived_Product_Parameters/Vector_Range_Origin/y_position**	
			ASCII_Real *Units_of_Length*
img_surface:**z_position** *DERIVED_IMAGE_PARMS.**RANGE_ORIGIN_VECTOR***	The z component of a Cartesian position vector.	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Imaging_Parameters/Derived_Product_Parameters/Vector_Range_Origin/z_position**	
			ASCII_Real *Units_of_Length*
msn_surface:**received_packets** *TELEMETRY.**RECEIVED_PACKETS***	The received_packets attribute provides the total number of telemetry packets actually used to construct this data product. cf. expected_packets.	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Mission_Parameters/Telemetry_Information/received_packets**	
			ASCII_NonNegative_Integer
	The local_identifier_reference attribute provides the value of the local_identifier of the entity described by the referencing	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometr**	

local_identifier_reference *LANDER_DERIVED_GEOMETRY_PARMS.**REFERENCE_COORD_SYSTEM_INDEX*** *LANDER_DERIVED_GEOMETRY_PARMS.**REFERENCE_COORD_SYSTEM_NAME***	class. Note that a local_identifier attribute, with the same value as this local_identifier_reference, must be present within the label.	**y/Geometry_Lander/Camera_Model_Parameters/Coordinate_Space_Reference/Local_Internal_Reference/local_identifier_reference** **2) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Coordinate_Space_Definition[2]/Coordinate_Space_Reference/Local_Internal_Reference/local_identifier_reference** **3) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Derived_Geometry[1]/Coordinate_Space_Reference/Local_Internal_Reference/local_identifier_reference** **4) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Local_Internal_Reference/local_identifier_reference** **5) /Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Local_Internal_Reference/local_identifier_reference** **6) /Product_Observational/Observation_Area/Discipline_Area/Display_Settings/Local_Internal_Reference/local_identifier_reference**	
			ASCII_Local_Identifier_Reference
img:**sample_bit_mask** *IMAGE_DATA.**SAMPLE_BIT_MASK***	The sample_bit_mask attribute Specifies the active bits in a sample. Any bit mask is valid in an non-raw product. Any 8-bit product, whether a scaled raw product or other, will have the value "2#11111111" and be stored in one byte. Any 12-bit product, whether an unscaled raw product, or an ILUT partially-processed product (see companding_method), will have the value "2#0000111111111111" and be stored in two bytes. A 15-bit product (e.g. Radiometrically-corrected Calibrated product type) will have the value "2#0111111111111111" and be stored in two bytes. Any 32-bit integer product (e.g. Histogram Raw product) will have the value "2#11111111111111111111111111111111" and be stored in four bytes. For floating-point data, sample_bit_mask is not valid and may be absent. If present, it should be ignored. NOTE: In the PDS, the domain of sample_bit_mask is dependent upon the currently-described value in the sample_bits attribute and only applies to integer values.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Sampling_Parameters/sample_bit_mask**	
			ASCII_Short_String_Collapsed

img:**companding_venue** *INSTRUMENT_STATE_PARMS.**SAMPLE_BIT_METHOD***	The companding_venue attribute specifies where companding or expanding of the data was completed either onboard or on the ground. Valid values: 'Hardware' - companding was done by hardware, for example inside the camera. 'Software' - companding was done by flight software. 'None' - data was not companded	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Sampling_Parameters/Companding_Parameters/companding_venue**	
		1) Hardware 2) Software 3) None	ASCII_Short_String_Collapsed
img:**companding_method** *INSTRUMENT_STATE_PARMS.**SAMPLE_BIT_MODE_ID***	The companding_method attribute specifies how data was companded. Generally this will either be via a lookup table (such as a square root encoding), or by shifting bits to preserve the high order bits and discard the low order bits. The value of this keyword is mission specific but there are recommended values that should apply across missions when possible: NONE - no scaling. LUTn - use the numbered lookup table. Lookup tables are defined in the mission SIS. It is preferred for "n" to be a number but it could be a name, for example LUT_MMM_3 to indicate LUT 3 for the MMM instruments (on MSL). MSB_BITn - Shift to make bit "n" the most significant. Bits start numbering at 0 so MSB_BIT7 means no shift for a 12->8 bit companding, while MSB_BIT11 means to shift right 4 bits for a 12->8 bit companding. AUTOSHIFT - Data should be shifted to preserve the highest value. This value should only appear in a command echo; one of the MSB_BITn values should be used in downlinked data to specify what the actual shift was.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Sampling_Parameters/Companding_Parameters/companding_method**	
			ASCII_Short_String_Collapsed
cart:**sample** *SURFACE_PROJECTION_PARMS.**SAMPLE_PROJECTION_OFFSET***	The sample attribute specifies the sample number	**1) /Product_Observational/Observation_Area/Discipline_Area/Cartography/Spatial_Reference_Information/Horizontal_Coordinate_System_Definition/Local/Map_Projection_Lander/Orthorectified/Pixel_Position_Origin/sample**	
			ASCII_Real
msn_surface:**sequence_id** *IDENTIFICATION.**SEQUENCE_ID***	The sequence_id identifies the command sequence used to acquire this product. **InSight Specific:** *Value is extracted from the IMAGE_ID field and indicates the purpose for which the image was acquired.*	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Mission_Parameters/Command_Execution_Information/sequence_id**	
			ASCII_Short_String_Collapsed
geom:**solar_azimuth** *SITE_DERIVED_GEOMETRY_PARMS.**SOLAR_AZIMUTH*** *SITE_DERIVED_GEOMETRY_PARMS.**SOLAR_AZIMUTH***	The solar_azimuth attribute specifies one of two angular measurements indicating the direction to the Sun as measured from a specific point on the surface of a planet (eg., from a lander or rover). The positive direction of the elevation is set	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Derived_Geometry[1]/solar_azimuth**	

__UNIT	by the positive_azimuth_direction attribute in the reference coordinate space. The azimuth is measured positively in the clockwise direction (as viewed from above) with the meridian passing through the positive spin axis of the planet (i.e., the north pole) defining the zero reference. **InSight Specific:** *Computed using SPICE.*	**2) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Derived_Geometry[2]/solar_azimuth**	
			ASCII_Real *Units_of_Angle*
geom:**solar_elevation** *SITE_DERIVED_GEOMETRY_PARMS.**SOLAR_ELEVATION*** *SITE_DERIVED_GEOMETRY_PARMS.**SOLAR_ELEVATION__UNIT***	The solar_elevation attribute specifies one of two angular measurements indicating the direction to the Sun as measured from a specific point on the surface of a planet (eg., from a lander or rover). The positive direction of the elevation is set by the positive_elevation_direction attribute in the reference coordinate space. The elevation is measured from the plane which is normal to the line passing between the surface point and the planet's center of mass, and that intersects the surface point. **InSight Specific:** *Computed using SPICE.*	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Derived_Geometry[1]/solar_elevation** **2) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Derived_Geometry[2]/solar_elevation**	
			ASCII_Real *Units_of_Angle*
solar_longitude *IDENTIFICATION.**SOLAR_LONGITUDE***	The solar_longitude attribute provides the angle between the body-Sun line at the time of interest and the body-Sun line at its vernal equinox. **InSight Specific:** *This provides a measure of season on a target body, with values of 0 to 90 degrees representing northern spring, 90 to 180 degrees representing northern summer, 180 to 270 degrees representing northern autumn and 270 to 360 degrees representing northern winter.*	**1) /Product_Observational/Observation_Area/Time_Coordinates/solar_longitude**	
			ASCII_Real *Units_of_Angle*
msn:**solar_longitude** *IDENTIFICATION.**SOLAR_LONGITUDE***	solar_longitude is the solar longitude, as defined in the main PDS4 data dictionary. **InSight Specific:** *This provides a measure of season on a target body, with values of 0 to 90 degrees representing northern spring, 90 to 180 degrees representing northern summer, 180 to 270 degrees representing northern autumn and 270 to 360 degrees representing northern winter.*	**1) /Product_Observational/Observation_Area/Mission_Area/Mission_Information/Surface_Mission_Information/solar_longitude**	
			ASCII_Real *Units_of_Angle*
geom:**solution_id** *LANDER_COORDINATE_SYSTEM.**SOLUTION_ID***	The solution_id attribute specifies the unique identifier for the solution set to which the values in the group belong. For certain kinds of information, such as pointing correction (pointing models) and rover localization (coordinate system definitions), the "true" value is unknown and only estimates of	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Coordinate_Space_Definition[1]/Coordinate_Space_Present/Coordinate_Space_Indexed/solution_id**	

	the true value exist. Thus, more than one set of estimates may exist simultaneously, each valid for its intended purpose. Each of these sets is called a "solution" to the unknown true value. The solution_id attribute is used to identify which solution is being expressed by the containing group. No specific naming convention is defined here, however it is recommended that projects adopt one. The intent is to be able to identify who created the solution, and why. Possible components of the naming convention include user, institution, purpose, request ID, version, program, date/time. **InSight Specific:** *Must be globally unique across all coordinate system instances, i.e. it cannot be reused to define the same coordinate system instance differently. Different coordinate system instances (for example, different values of the RMC index) may share the same SOLUTION_ID. See also REFERENCE_COORD_SYSTEM_NAME and REFERENCE_COORD_SYSTEM_SOLN_ID. The SOLUTION_ID should be the same identifier used in the PLACES rover localization database. The special name "telemetry" is used for values telemetered from the rover. If SOLUTION_ID is absent, "telemetry" should be assumed.*	**2) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Coordinate_Space_Definition[2]/Coordinate_Space_Present/Coordinate_Space_Indexed/solution_id**	
			ASCII_Short_String_Collapsed
msn:**spacecraft_clock_partition** *IDENTIFICATION.**SPACECRAFT_CLOCK_CNT_PARTITION***	The spacecraft_clock_partition provides the clock partition active for the spacecraft_clock attribute. **InSight Specific:** *Always 1 for InSight.*	**1) /Product_Observational/Observation_Area/Mission_Area/Mission_Information/spacecraft_clock_partition**	
			ASCII_Integer
msn:**spacecraft_clock_start** *IDENTIFICATION.**SPACECRAFT_CLOCK_START_COUNT***	The spacecraft_clock_start is the value of the spacecraft clock at the beginning of the observation.	**1) /Product_Observational/Observation_Area/Mission_Area/Mission_Information/spacecraft_clock_start**	
			ASCII_Short_String_Collapsed
msn:**spacecraft_clock_stop** *IDENTIFICATION.**SPACECRAFT_CLOCK_STOP_COUNT***	The spacecraft_clock_stop is the value of the spacecraft clock at the end of the observation. spacecraft_clock_stop should only be used if there's also a spacecraft_clock_start value.	**1) /Product_Observational/Observation_Area/Mission_Area/Mission_Information/spacecraft_clock_stop**	
			ASCII_Short_String_Collapsed
geom:**spice_kernel_file_name**	The spice_kernel_file_name attribute provides the file name of a SPICE kernel file used to process the data or to produce geometric quantities given in the label.	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/SPICE_Kernel_Files/SPICE_Kernel_Identification/spice_kernel_file_name**	

*TELEMETRY.**SPICE_FILE_NAME***			ASCII_File_Name
start_date_time *IDENTIFICATION.**START_TIME***	The start_date_time attribute provides the date and time appropriate to the beginning of the product being labeled. **InSight Specific:** *The time period of interest is returned from SPICE suburoutines and is based on the beginning of data acquisition.*	**1) /Product_Observational/Observation_Area/Time_Coordinates/start_date_time**	
			ASCII_Date_Time_YMD_UTC
img_surface:**stereo_baseline_length** *DERIVED_IMAGE_PARMS.**STEREO_BASELINE***	The stereo_baseline_length attribute specifies the separation between the two cameras used for processing of the stereo image.	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Mission_Parameters/Stereo_Product_Parameters/stereo_baseline_length**	
			ASCII_Real *Units_of_Length*
img_surface:**stereo_match_id** *IDENTIFICATION.**STEREO_MATCH_ID***	The stereo_match_id attribute specifies which other image this image matches with for stereo processing. If used for a mission, the two images making up a stereo pair should share the same stereo_match_id value. **InSight Specific:** *The image_id is a 32-bit integer token set in the command sent from the ground, and returned in the image telemetry.Â It contains five subfields, each of which has its own label attributes: sequence_id, mesh_id, mosaic_id, stereo_id, and camera eye (frame_id). See each attribute for its usage.Â Note that image_id values are not unique (multiple images may share the same ID).*	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Imaging_Parameters/Image_Identifiers/stereo_match_id**	
			ASCII_Short_String_Collapsed
stop_date_time *IDENTIFICATION.**STOP_TIME***	The stop_date_time attribute provides the date and time appropriate to the end of the product being labeled. **InSight Specific:** *The time period of interest is returned from SPICE suburoutines and is based on the end of data acquisition.*	**1) /Product_Observational/Observation_Area/Time_Coordinates/stop_date_time**	
			ASCII_Date_Time_YMD_UTC
msn_surface:**provider_id** *TELEMETRY.**TELEMETRY_PROVIDER_ID***	The provider_id attribute identifies the organization or subsystem that supplied the telemetry data product to the producer of the raw (EDR) PDS data product. This is typically (but not always) the organization responsible for reassembling packetized data into a single product. These may vary by mission so the permissible values should be set by the mission dictionaries.	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Mission_Parameters/Telemetry_Information/provider_id**	
			ASCII_Short_String_Collapsed

msn_surface:**telemetry_source_name** *TELEMETRY.**TELEMETRY_SOURCE_NAME***	The telemetry_source_name specifies the name source of the telemetry data described in the parent class.	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Mission_Parameters/Telemetry_Information/telemetry_source_name**	
			ASCII_Short_String_Collapsed
msn_surface:**telemetry_source_sclk_start** *TELEMETRY.**TELEMETRY_SOURCE_SCLK_START***	The telemetry_source_sclk_start attribute specifies the value of the spacecraft clock (in seconds) at the creation time of the source product from which this product was derived. **InSight Specific:** *This is the time in the CCSDS header. Used to find all the matching packets for one product.*	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Mission_Parameters/Telemetry_Information/telemetry_source_sclk_start**	
			ASCII_Short_String_Collapsed
msn_surface:**telemetry_source_start_time** *TELEMETRY.**TELEMETRY_SOURCE_START_TIME***	The telemetry_source_start_time specifies the creation time of the source product from which this product was derived. It is the same as the telemetry_source_sclk_start converted to Spacecraft Event Time (SCET).	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Mission_Parameters/Telemetry_Information/telemetry_source_start_time**	
			ASCII_Date_Time_YMD_UTC
msn_surface:**transport_protocol** *TELEMETRY.**TELEMETRY_SOURCE_TYPE***	The transport_protocol attribute specifies the protocol used in the creation of the telemetry data products by the subsystem which generates the telemetry stream.	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Mission_Parameters/Telemetry_Information/transport_protocol**	
		1) SFDU 2) Data Product	ASCII_Short_String_Collapsed
img:**active_flag**	The active_flag attribute indicates whether or not the data correction described by the parent class is active.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Command_Parameters/Data_Correction_Parameters/Data_Correction/active_flag** **2) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Data_Correction_Parameters/Data_Correction[1]/active_flag** **3) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Data_Correction_Parameters/Data_Correction[2]/active_flag** **4) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Data_Correction_Parameters/Data_Correction[3]/active_flag**	

			ASCII_Boolean
img:**Algorithm_Parameter**	The Algorithm_Parameter class provides a name and value(s) use for input into the autoexposure algorithm.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Command_Parameters/Autoexposure_Parameters/Algorithm_Parameter[1]** **2) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Command_Parameters/Autoexposure_Parameters/Algorithm_Parameter[2]** **3) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Command_Parameters/Autoexposure_Parameters/Algorithm_Parameter[3]** **4) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Command_Parameters/Autoexposure_Parameters/Algorithm_Parameter[4]**	
		1) *name* 2) *value*	
Alias	The Alias class provides a single alternate name and identification for this product in this or some other archive or data system.	**1) /Product_Observational/Identification_Area/Alias_List/Alias**	
		1) *alternate_id* 2) *alternate_title* 3) *comment*	
Alias_List	The Alias_List class provides a list of paired alternate names and identifications for this product in this or some other archive or data system.	**1) /Product_Observational/Identification_Area/Alias_List**	
		1) *alias*	
Array_2D_Image	The Array 2D Image class is an extension of the Array 2D class and defines a two dimensional image.	**1) /Product_Observational/File_Area_Observational/Array_2D_Image**	
		1) *offset* 2) *axes* 3) *name* 4) *local_identifier* 5) *axis_index_order* 6) *md5_checksum* 7) *description* 8) *has_Display_2d_Image*	

		9) *has_Axis_Array* 10) *has_Element_Array* 11) *associated_Special_Constants* 12) *associated_Statistics* 13) *data_object* 14) *local_internal_reference*	
Array_3D_Image	The Array 3D Image class is an extension of the Array 3D class and defines a three dimensional image.	**1) /Product_Observational/File_Area_Observational/Array_3D_Image**	
		1) *offset* 2) *axes* 3) *name* 4) *local_identifier* 5) *axis_index_order* 6) *md5_checksum* 7) *description* 8) *has_Axis_Array* 9) *has_Element_Array* 10) *associated_Special_Constants* 11) *associated_Statistics* 12) *data_object* 13) *local_internal_reference*	
geom:**Articulation_Device_Parameters**	The Articulation_Device_Parameters class contains those attributes and sub-classes that describe an articulation device. An articulation device is anything that can move independently of the spacecraft to which it is attached. Examples include mast heads, wheel bogies, arms, filter wheel, scan platforms.	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Articulation_Device_Parameters[1]** **2) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Articulation_Device_Parameters[2]**	
		1) *device_id* 2) *device_name* 3) *device_mode* 4) *device_phase* 5) *selected_instrument_id* 6) *Coordinate_Space_Present*	
img:**autoexposure_algorithm_name**	The autoexposure_algorithm_name attribute provides the algorithm used for histograwm thresholding or autoexposure of the image. Some example algorithms from past missions are, 'Maki 2003' used on MER cameras, MSL ECAMs, M2020	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Command_Parameters/Autoexposure_Parameters/autoexposure_algorithm_name**	

	EECAMs; 'Maurice 2012' used on MSL ChemCam; 'Smith 1997' used on Mars Pathfinder Imager.	**2) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Autoexposure_Parameters/autoexposure_algorithm_name**	
			ASCII_Short_String_Collapsed
img:**Autoexposure_Parameters**	The Autoexposure_Parameters class contains attributes used to identify or describe the histogram thresholding algorithm and applicable attributes required for those algorithms. The input parameters for the algorithm can be specified using the Algorithm_Parameter class or via a Local_Internal_Reference to a mission-specific parameter definition.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Command_Parameters/Autoexposure_Parameters** **2) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Autoexposure_Parameters**	
		1) *autoexposure_algorithm_name* 2) *Algorithm_Parameter*	
Axis_Array	The Axis Array class is used as a component of the array class and defines an axis of the array.	**1) /Product_Observational/File_Area_Observational/Array_3D_Image/Axis_Array[1]** **2) /Product_Observational/File_Area_Observational/Array_3D_Image/Axis_Array[2]** **3) /Product_Observational/File_Area_Observational/Array_3D_Image/Axis_Array[3]**	
		1) *axis_name* 2) *local_identifier* 3) *elements* 4) *unit* 5) *sequence_number* 6) *has_Band_Bin_Set*	
axis_name	The axis_name attribute provides a word or combination of words by which the axis is known.	**1) /Product_Observational/File_Area_Observational/Array_3D_Image/Axis_Array[1]/axis_name**	

		2) /Product_Observational/File_Area_Observational/Array_3D_Image/Axis_Array[2]/axis_name **3) /Product_Observational/File_Area_Observational/Array_3D_Image/Axis_Array[3]/axis_name**	
			ASCII_Short_String_Collapsed
disp:**blue_channel_band**	The blue_channel_band attribute identifies the number of the band, along the band axis, that should be loaded, by default, into the blue channel of a display device. The first band along the band axis has band number 1.	**1) /Product_Observational/Observation_Area/Discipline_Area/Display_Settings/Color_Display_Settings/blue_channel_band**	
			ASCII_Integer
geom:**CAHV_Model**	The CAHV camera model is equivalent to the standard linear photogrammetric model for a pinhole camera, It is useful for very small field of view cameras and as a building block for more complex camera models. The CAHV model consists of four 3-vectors: C, A, H, and V. Vector C gives the location of the pinhole. Vector A gives the camera axis, defined as the normal to the image plane. Vector H encodes the horizontal axis of the image plane (H'), the coor- dinate (Hc) of the image column at the optical center of the image plane, and the horizontal focal length (Hs) of the camera, in pixels. Vector V encodes corresponding information (V', Vc, Vs) in the vertical direction. The angle (theta) between horizontal and vertical vectors H' and V' is about 90 degrees. (Taken from Camera Response Simulation for Planetary Exploration, by Dr. Richard Madison, Marc Pomerantz, and Dr. Abhinandan Jain, http://trs-new.jpl.nasa.gov/dspace/bitstream/2014/37771/1/05-1692.pdf)	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Camera_Model_Parameters/CAHV_Model**	
		1) *Vector_Center* 2) *Vector_Axis* 3) *Vector_Horizontal* 4) *Vector_Vertical*	
geom:**CAHVOR_Model**	The CAHVOR model describes a camera with radial lens distortion about the lens axis. In addition to the CAHV parameters, it includes 3-vectors O and R. Vector O is the optical axis of the lens, slightly different from vector A due to imperfect lens mounting. A ray from a point in space, passing through the pinhole, bends at the pinhole according to a function of the angle between the ray and optical axis O. The function is a polynomial whose coefficients are stored in vector R. (Taken from Camera Response Simulation for Planetary Exploration, by Dr. Richard Madison, Marc Pomerantz, and Dr. Abhinandan Jain, http://trs-	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Camera_Model_Parameters/CAHVOR_Model**	
		1) *Optical_Terms* 2) *Vector_Center* 3) *Radial_Terms* 4) *Vector_Axis* 5) *Vector_Horizontal* 6) *Vector_Vertical*	

	new.jpl.nasa.gov/dspace/bitstream/2014/37771/1/05-1692.pdf)		
geom:**CAHVORE_Model**	A third model, CAHVORE, describes more general cameras including those with fisheye or otherwise wide field of view lenses. An additional vector, E, describes the apparent motion of the camera entrance pupil. (Taken from Camera Response Simulation for Planetary Exploration, by Dr. Richard Madison, Marc Pomerantz, and Dr. Abhinandan Jain, http://trs-new.jpl.nasa.gov/dspace/bitstream/2014/37771/1/05-1692.pdf)	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Camera_Model_Parameters/CAHVORE_Model**	
		1) *cahvore_model_type* 2) *cahvore_model_parameter* 3) *Vector_Entrance* 4) *Optical_Terms* 5) *Vector_Center* 6) *Radial_Terms* 7) *Vector_Axis* 8) *Vector_Horizontal* 9) *Vector_Vertical*	
geom:**cahvore_model_parameter**	The cahvore_parameter_type attribute is a scalar floating-point number used for CAHVORE Type 3 models (see cahvore_model_type). If the parameter is 1.0, the model is identical to type 1; if 0.0, it is identical to type 2. Most fish-eye lenses use a value in between.	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Camera_Model_Parameters/CAHVORE_Model/cahvore_model_parameter**	
			ASCII_Real
geom:**cahvore_model_type**	The cahvore_model_type attribute indicates which variant of the CAHVORE model to use. Type 1 is a perspective-projection model, similar to CAHV and CAHVOR except for the moving entrance pupil. Type 2 is a fish-eye lens model reflecting fundamentally different geometry. Type 3 is a generalization that includes the first two, and is used for most fisheye-type lenses (see cahvore_model_parameter).	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Camera_Model_Parameters/CAHVORE_Model/cahvore_model_type**	
		1) 1 2) 2 3) 3	ASCII_Integer
geom:**Camera_Model_Parameters**	A camera model describes the mathematical relationship between the coordinates of a point in 3-dimensional space and its projection onto a 2-dimensional image plane. There are numerous types of camera models, only two of which are currently implemented.	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Camera_Model_Parameters**	
		1) *model_type* 2) *calibration_source_id* 3) *solution_id* 4) *Internal_Reference* 5) *CAHVORE_Model* 6) *Coordinate_Space_Reference* 7) *Quaternion_Model_Transform* 8) *Vector_Model_Transform*	

cart:**Cartography**	The Cartography class provides a description of how a 3D sphere, spheroid, or elliptical spheroid or the celestial sphere is mapped onto a plane.	**1) /Product_Observational/Observation_Area/Discipline_Area/Cartography**	
		1) *has_Spatial_Domain* 2) *has_Spatial_Reference_Information*	
Citation_Information	The Citation_Information class provides specific fields often used in citing the product in journal articles, abstract services, and other reference contexts.	**1) /Product_File_Text/Identification_Area/Citation_Information**	
		1) *author_list* 2) *editor_list* 3) *publication_year* 4) *keyword* 5) *description*	
disp:**color_display_axis**	The color_display_axis attribute identifies, by name, the axis of an Array (or Array subclass) that is intended to be displayed in the color dimension of a display device. I.e., bands from this dimension will be loaded into the red, green, and blue bands of the display device. The value of this attribute must match the value of one, and only one, axis_name attribute in an Axis_Array class of the associated Array.	**1) /Product_Observational/Observation_Area/Discipline_Area/Display_Settings/Color_Display_Settings/color_display_axis**	
			ASCII_Short_String_Collapsed
disp:**Color_Display_Settings**	The Color_Display_Settings class provides guidance to data users on how to display a multi-banded Array object on a color-capable display device.	**1) /Product_Observational/Observation_Area/Discipline_Area/Display_Settings/Color_Display_Settings**	
		1) *color_display_axis* 2) *comment* 3) *red_channel_band* 4) *green_channel_band* 5) *blue_channel_band*	
img:**Color_Filter_Array_Parameters**	The Color_Filter_Array_Parameters class describes whether or not an image was acquired using a Color Filter Array (CFA) and if so, whether and how the CFA pattern was removed. A CFA is a method for making color images using one exposure on a single sensor plane, where microfilters of different wavelengths are put in front of pixels in a specific pattern. The most common pattern is the Bayer pattern, which has a red, blue, and two green pixels in every 2x2 pixel square. Although generally used for RGB color, CFA filters can be of any number and wavelength (see color_filter_array_type).	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Color_Filter_Array_Parameters**	
		1) *color_filter_array_type* 2) *color_filter_array_state* 3) *color_filter_array_venue* 4) *bayer_algorithm*	
img:**color_filter_array_state**		**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/I**	

	Specifies whether the image still has a CFA pattern ("Encoded"), the CFA pattern has been removed ("Decoded") or it never had a pattern ("No CFA").	**mage_Product_Information/Color_Filter_Array_Parameters/color_filter_array_state**	
		1) Encoded 2) Decoded 3) No CFA	ASCII_Short_String_Collapsed
img:**Color_Parameters**	The Color_Parameters class contains parameters describing color correction or processing and how the image is represented in color.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Color_Parameters**	
		1) *color_space* 2) *color_component* 3) *illuminant* 4) *encoded_display_gamma* 5) *Onboard_Responsivity* 6) *Onboard_Color_Matrix*	
msn_surface:**Command_Execution_Information**	The Command_Execution_Information class contains information about how the command that acquired this data was executed, such as sequence or activity.	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Mission_Parameters/Command_Execution_Information**	
		1) *sequence_id* 2) *sequence_version_id* 3) *sequence_execution_count* 4) *command_sequence_number* 5) *command_source_id* 6) *observation_id* 7) *request_id*	
img:**Command_Parameters**	The Command_Parameters class contains attributes used to identify or describe the commands sent to a spacecraft to perform one or more actions resulting in the acquisition of the current data product.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Command_Parameters**	
		1) *description* 2) *detector_erase_count* 3) *Autoexposure_Parameters* 4) *Exposure_Parameters* 5) *Data_Correction_Parameters*	
comment	The comment attribute is a character string expressing one or more remarks or thoughts relevant to the object.	**1) /Product_Observational/Identification_Area/Alias_List/Alias/comment** **2) /Product_Observational/Observation_Area/comment**	

		3) **/Product_Observational/Observation_Area/Investigation_Area/Internal_Reference/comment** **4)** **/Product_Observational/Observation_Area/Observing_System/Observing_System_Component[1]/Internal_Reference/comment** **5)** **/Product_Observational/Observation_Area/Observing_System/Observing_System_Component[2]/Internal_Reference/comment** **6)** **/Product_Observational/Observation_Area/Target_Identification/Internal_Reference/comment** **7)** **/Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Input_Product_List/Input_Product/Internal_Reference/comment** **8)** **/Product_Observational/Reference_List/Internal_Reference/comment** **9)** **/Product_Observational/Reference_List/Source_Product_Internal/comment**	
			ASCII_Text_Preserved
img:**Companding_Parameters**	The Companding_Parameters class describes whether or not data is or has had its bit depth reduced (for example conversion from 12 to 8 bits via a lookup table or bit scaling), the venue where it occurred (Software or Hardware), and the method used to complete the companding.	**1)** **/Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Sampling_Parameters/Companding_Parameters**	
		1) *companding_state* 2) *companding_venue* 3) *companding_method*	
img:**companding_state**	The companding_state attribute specifies whether the data is or has had its bit depth reduced, for example conversion from 12 to 8 bits via a lookup table or bit scaling. Valid values: None - values have not been companded. Companded - values are	**1)** **/Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Sampling_Parameters/Companding_Parameters/companding_state**	

	currently companded. Expanded - values have been companded but are now expanded back to original size.	1) None 2) Companded 3) Expanded	ASCII_Short_String_Collapsed
img:**compression_class**	The compression_class attribute identifies the type of on-board compression used for data storage and transmission. Note that the compression_type identifies the specific compression algorithm used (for example, ICER), whereas the compression_class gives a simple indicator of the type of compression mode. Valid values: 'Lossless', 'Lossy', 'Uncompressed'	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Compression_Parameters/compression_class**	
		1) Lossless 2) Lossy 3) Uncompressed	ASCII_Short_String_Collapsed
geom:**Coordinate_Space_Definition**	The Coordinate_Space classes are typically used for lander/rover geometry while the Coordinate_System construction is used for orbiter/flyby geometry.	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Coordinate_Space_Definition[1]** **2) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Coordinate_Space_Definition[2]**	
		1) *local_identifier* 2) *positive_azimuth_direction* 3) *positive_elevation_direction* 4) *Coordinate_Space_Present* 5) *Vector_Origin_Offset* 6) *Quaternion_Plus_Direction* 7) *Coordinate_Space_Reference*	
geom:**Coordinate_Space_Index**	Identifies a coordinate space using an index value given in an identified list.	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Coordinate_Space_Definition[1]/Coordinate_Space_Present/Coordinate_Space_Indexed/Coordinate_Space_Index[1]** **2) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Coordinate_Space_Definition[1]/Coordinate_Space_Present/Coordinate_Space_Indexed/Coordinate_Space_Index[2]** **3) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Coordinate_Space_Definition[1]/Coordinate_Space_Reference/Coordinate_Space_Indexed/Coordinate_Space_Index** **4) /Product_Observational/Observation_Area/Discipline_Area/Geometr**	

		y/Geometry_Lander/Coordinate_Space_Definition[2]/Coordinate_Space_Present/Coordinate_Space_Indexed/Coordinate_Space_Index[1] **5) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Coordinate_Space_Definition[2]/Coordinate_Space_Present/Coordinate_Space_Indexed/Coordinate_Space_Index[2]** **6) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Derived_Geometry[2]/Coordinate_Space_Reference/Coordinate_Space_Indexed/Coordinate_Space_Index**	
		1) *index_value_number* 2) *index_id*	
geom:**Coordinate_Space_Indexed**	The Coordinate_Space_Indexed class contains the attributes and classes identifying the indexed coordinate space.	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Coordinate_Space_Definition[1]/Coordinate_Space_Present/Coordinate_Space_Indexed** **2) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Coordinate_Space_Definition[1]/Coordinate_Space_Reference/Coordinate_Space_Indexed** **3) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Coordinate_Space_Definition[2]/Coordinate_Space_Present/Coordinate_Space_Indexed** **4) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Derived_Geometry[2]/Coordinate_Space_Reference/Coordinate_Space_Indexed**	
		1) *coordinate_space_frame_type* 2) *solution_id* 3) *Coordinate_Space_Index*	
geom:**Coordinate_Space_Present**	The Coordinate_Space_Present class includes the attributes that identifies the spacecraft's present coordinate space.	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometr**	

		y/Geometry_Lander/Coordinate_Space_Definition[1]/Coordinate_Space_Present **2) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Coordinate_Space_Definition[2]/Coordinate_Space_Present**	
		1) *Coordinate_Space_Indexed*	
geom:**Coordinate_Space_Reference**	The Coordinate_Space_Reference class includes the attributes that identify the reference coordinate space to be used in relation to the spacecraft's present coordinate space. The reference coordinate space is the space in which the present coordinate space is defined.	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Camera_Model_Parameters/Coordinate_Space_Reference** **2) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Coordinate_Space_Definition[1]/Coordinate_Space_Reference** **3) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Coordinate_Space_Definition[2]/Coordinate_Space_Reference** **4) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Derived_Geometry[1]/Coordinate_Space_Reference** **5) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Derived_Geometry[2]/Coordinate_Space_Reference**	
		1) *Coordinate_Space_Indexed*	
cart:**Cylindrical**	null	**1) /Product_Observational/Observation_Area/Discipline_Area/Cartography/Spatial_Reference_Information/Horizontal_Coordinate_System_Definition/Local/Map_Projection_Lander/Cylindrical**	
		1) *pixel_scale_x* 2) *pixel_scale_y* 3) *maximum_elevation*	

		4) *minimum_elevation* 5) *start_azimuth* 6) *stop_azimuth* 7) *zero_elevation_line* 8) *Vector_Projection_Origin*	
img:**Data_Correction**	The Data_Correction class specifies describes details regarding the calibration and/or processing performed on the data product. This class can be used to describe various data corrections, such as antiblooming, bad pixel replacement, blemish protection, dark current correction, or shutter correction. This can be specified multiple times in order to detail numerous corrections, and should be used to designate PDS3-like flag attributes, such as dark_current_correction_flag and flat_field_correction_flag.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Command_Parameters/Data_Correction_Parameters/Data_Correction** **2) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Data_Correction_Parameters/Data_Correction[1]** **3) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Data_Correction_Parameters/Data_Correction[2]** **4) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Data_Correction_Parameters/Data_Correction[3]**	
		1) *active_flag* 2) *data_correction_type* 3) *data_correction_venue* 4) *Data_Correction_File* 5) *Flat_Field_Correction_Parameters* 6) *Radiometric_Correction_Parameters* 7) *Shutter_Subtraction_Parameters*	
img:**Data_Correction_File**	The Data_Correction_File class specifies a file containing explicit details regarding the calibration and/or processing performed on the data product. The enclosing class and surrounding attribute provide the necessary context to interpret this file. As a subclass of the Data_Correction_Parameters class, this specifies calibration applied to the science data as opposed to calibration the instrument before launch. As a subclass of the Derived_Product_Parameters class, this specifies a file	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Data_Correction_Parameters/Data_Correction[3]/Data_Correction_File**	
		1) *description* 2) *External_Reference*	

	describing the post processing of the product after radiometric and photometric calibrations.		
img:**Data_Correction_Parameters**	The Data_Correction_Parameters class describes data processing steps applied to data, either on-board a spacecraft or after receipt of the data on the ground, to remove artifacts introduced into the data by the instrument. As a child of the Command_Parameters class, these attribute values are those that were commanded to the spacecraft.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Command_Parameters/Data_Correction_Parameters** **2) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Data_Correction_Parameters**	
		1) *Data_Correction*	
img:**data_correction_type**	The data_correction_type attribute specifies the type of data correction to be applied using the accompanying file or constants. Valid values: 'Antiblooming', 'Bad Pixel', 'Blemish Protection', 'Brightness', 'Dark Current', 'Flat Field', 'Inverse LUT', 'Light Flood', 'Responsivity', 'Shutter'	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Command_Parameters/Data_Correction_Parameters/Data_Correction/data_correction_type** **2) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Data_Correction_Parameters/Data_Correction[1]/data_correction_type** **3) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Data_Correction_Parameters/Data_Correction[2]/data_correction_type** **4) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Data_Correction_Parameters/Data_Correction[3]/data_correction_type**	
		1) Antiblooming 2) Bad Pixel 3) Blemish Protection 4) Brightness 5) Dark Current 6) Flat Field 7) Inverse LUT 8) Light Flood 9) Radiometric 10) Responsivity 11) Shutter Subtraction	ASCII_Short_String_Collapsed

<table>
<tr><td>img:data_correction_venue</td><td>The data_correction_venue attribute specifies where data correction was performed. Valid values: 'Onboard' - data correction was performed onboard the spacecraft. 'Ground' - data correction was performed by software on the ground.</td><td colspan="2">1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Command_Parameters/Data_Correction_Parameters/Data_Correction/data_correction_venue

2) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Data_Correction_Parameters/Data_Correction[1]/data_correction_venue

3) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Data_Correction_Parameters/Data_Correction[2]/data_correction_venue

4) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Data_Correction_Parameters/Data_Correction[3]/data_correction_venue

1) Onboard
2) Ground

ASCII_Short_String_Collapsed</td></tr>
<tr><td>data_type</td><td>The data_type attribute provides the hardware representation used to store a value in Element_Array.</td><td colspan="2">1) /Product_Observational/File_Area_Observational/Array_3D_Image/Element_Array/data_type

1) ComplexLSB16
2) ComplexLSB8
3) ComplexMSB16
4) ComplexMSB8
5) IEEE754LSBDouble
6) IEEE754LSBSingle
7) IEEE754MSBDouble
8) IEEE754MSBSingle
9) SignedBitString
10) SignedByte
11) SignedLSB2
12) SignedLSB4
13) SignedLSB8
14) SignedMSB2
15) SignedMSB4
16) SignedMSB8
17) UnsignedBitString
18) UnsignedByte

ASCII_Short_String_Collapsed</td></tr>
</table>

		19) UnsignedLSB2 20) UnsignedLSB4 21) UnsignedLSB8 22) UnsignedMSB2 23) UnsignedMSB4 24) UnsignedMSB8	
geom:**Derived_Geometry**	The Derived_Geometry class is a container for surface based observations (lander or rover). It is used to provide some geometric quantities relative to a specific Reference Coordinate Space.	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Derived_Geometry[1]** **2) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Derived_Geometry[2]**	
		1) *emission_angle* 2) *Coordinate_Space_Reference*	
img_surface:**Derived_Product_Parameters**	The Derived_Product_Parameters class contains attributes used to identify and describe processing performed on products in order to produce a higher level product.	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Imaging_Parameters/Derived_Product_Parameters**	
		1) *derived_image_type_name* 2) *horizon_mask_elevation* 3) *Placement_Target_Instrument* 4) *Vector_Range_Origin* 5) *Pointing_Correction_Parameters*	
description	The description attribute provides a statement, picture in words, or account that describes or is otherwise relevant to the object.	**1) /Product_Observational/Identification_Area/Modification_History/Modification_Detail/description** **2) /Product_Observational/File_Area_Observational/Header/description**	
			UTF8_Text_Preserved
geom:**Device_Angle**	The Device_Angle class is a container for the set of angles between the various components or devices of the spacecraft.	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Articulation_Device_Parameters[1]/Device_Angle**	
		1) *local_identifier* 2) *Device_Angle_Index*	

geom:**Device_Angle_Index**	The Device_Angle class is a container for the set of angles the spacecraft device specified in the parent Articulation_Device_Parameters class.	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Articulation_Device_Parameters[1]/Device_Angle/Device_Angle_Index[1]** **2) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Articulation_Device_Parameters[1]/Device_Angle/Device_Angle_Index[2]** **3) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Articulation_Device_Parameters[1]/Device_Angle/Device_Angle_Index[3]** **4) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Articulation_Device_Parameters[1]/Device_Angle/Device_Angle_Index[4]** **5) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Articulation_Device_Parameters[1]/Device_Angle/Device_Angle_Index[5]** **6) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Articulation_Device_Parameters[1]/Device_Angle/Device_Angle_Index[6]** **7) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Articulation_Device_Parameters[1]/Device_Angle/Device_Angle_Index[7]** **8) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Articulation_Device_Parameters[1]/Device_Angle/Device_Angle_Index[8]**	
		1) *index_value_angle* 2) *index_id*	

geom:**Device_Temperature**	The Device_Temperature class is a container for all available device temperatures of an articulated device and/or part(s) of a device.	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Articulation_Device_Parameters[1]/Device_Temperature** **2) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Articulation_Device_Parameters[2]/Device_Temperature**	
		1) *local_identifier* 2) *Device_Temperature_Index*	
geom:**Device_Temperature_Index**	The Device_Temperature_Index class specifies the attributes describing the temperature of one device or some part of a device.	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Articulation_Device_Parameters[1]/Device_Temperature/Device_Temperature_Index[1]** **2) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Articulation_Device_Parameters[1]/Device_Temperature/Device_Temperature_Index[2]** **3) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Articulation_Device_Parameters[1]/Device_Temperature/Device_Temperature_Index[3]** **4) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Articulation_Device_Parameters[1]/Device_Temperature/Device_Temperature_Index[4]** **5) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Articulation_Device_Parameters[2]/Device_Temperature/Device_Temperature_Index**	
		1) *index_value_temperature* 2) *index_value_number* 3) *index_id*	
Discipline_Area	The Discipline area allows the insertion of discipline specific metadata.	**1) /Product_Observational/Observation_Area/Discipline_Area**	

disp:**Display_Direction**	The Display_Direction class specifies how two of the dimensions of an Array object should be displayed in the vertical (line) and horizontal (sample) dimensions of a display device.	**1) /Product_Observational/Observation_Area/Discipline_Area/Display_Settings/Display_Direction**	
		1) *comment* 2) *horizontal_display_axis* 3) *horizontal_display_direction* 4) *vertical_display_axis* 5) *vertical_display_direction*	
disp:**Display_Settings**	The Display_Settings class contains one or more classes describing how data should be displayed on a display device.	**1) /Product_Observational/Observation_Area/Discipline_Area/Display_Settings**	
		1) *local_internal_reference* 2) *has_display_direction* 3) *has_color_display_settings* 4) *has_movie_display_settings*	
domain	The radial "zone" or "shell" of the target for which the observations were collected or which are represented in the product(s). The value may depend on wavelength_range and size of the target.	**1) /Product_Observational/Observation_Area/Primary_Result_Summary/Science_Facets/domain**	
		1) Atmosphere 2) Dynamics 3) Heliosphere 4) Interior 5) Interstellar 6) Ionosphere 7) Magnetosphere 8) Rings 9) Surface	ASCII_Short_String_Collapsed
img:**Downsampling_Parameters**	The Downsampling_Parameters class describes whether or not downsampling occurred, the venue where it occurrected (Software or Hardware), the method used to downsample, and the pixel averaging dimensions. A downsampled image is a smaller version of the image, resulting in reduced resolution of the same coverage area	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Downsampling_Parameters**	
		1) *downsampling_flag* 2) *downsampling_venue* 3) *downsampling_method* 4) *Pixel_Averaging_Dimensions*	
Element_Array	The Element Array class is used as a component of the array class and defines an element of the array.	**1) /Product_Observational/File_Area_Observational/Array_3D_Image/Element_Array**	
		1) *data_type*	

		2) *unit* 3) *scaling_factor* 4) *value_offset*	
elements	The elements attribute provides the count of the number of elements along an array axis.	**1) /Product_Observational/File_Area_Observational/Array_3D_Image/Axis_Array[1]/elements** **2) /Product_Observational/File_Area_Observational/Array_3D_Image/Axis_Array[2]/elements** **3) /Product_Observational/File_Area_Observational/Array_3D_Image/Axis_Array[3]/elements**	
			ASCII_NonNegative_Integer
Encoded_Image	The Encoded Image class is used for ancillary images in standard formats, such as JPEG.	**1) /Product_Browse/File_Area_Browse/Encoded_Image**	
		1) *name* 2) *offset* 3) *encoding_standard_id* 4) *local_identifier* 5) *object_length* 6) *md5_checksum* 7) *description* 8) *data_object*	
encoding_standard_id	The encoding_standard_id attribute provides the formal name of a standard used for the structure of an Encoded Byte Stream digital object.	**1) /Product_Browse/File_Area_Browse/Encoded_Image/encoding_standard_id**	
		1) GIF 2) J2C 3) JPEG 4) PDF 5) PDF/A 6) PNG 7) TIFF	ASCII_Short_String_Collapsed
img_surface:**Error_Model_Information**	The Error_Model_Information class specifies the name of the error model used, a reference to the algorithm descriptions, and the parameters needed for that algorithm. The specific set of values is determined by each individual missions.	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Imaging_Parameters/Error_Model_Information**	
		1) *error_model_name*	

		2) *Error_Model_Parameter* 3) *Internal_Reference*	
img_surface:**Error_Model_Parameter**	The Error_Model_Parameter class specifies name and value for a parameter defined by the error model described by the parent class.	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Imaging_Parameters/Error_Model_Information/Error_Model_Parameter[1]** **2) /Product_Observational/Observation_Area/Mission_Area/Surface_Imaging_Parameters/Error_Model_Information/Error_Model_Parameter[2]** **3) /Product_Observational/Observation_Area/Mission_Area/Surface_Imaging_Parameters/Error_Model_Information/Error_Model_Parameter[3]** **4) /Product_Observational/Observation_Area/Mission_Area/Surface_Imaging_Parameters/Error_Model_Information/Error_Model_Parameter[4]**	
		1) *name* 2) *value*	
img:**Exposure_Parameters**	The Exposure_Parameters class contains attributes identifying the image instrument exposure configuration and image exposure values. As a child of the Image_Product_Information class, these attribute values identify the actual exposure values when the image was taken. As a child of the Command_Parameters class, these attribute values are those that were commanded to the spacecraft at the time the image was taken.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Command_Parameters/Exposure_Parameters** **2) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Exposure_Parameters**	
		1) *exposure_count* 2) *exposure_duration* 3) *exposure_duration_count* 4) *exposure_type*	
Field_Delimited	The Field_Delimited class defines a field of a delimited record or a field of a delimited group.	**1) /Product_Observational/File_Area_Observational/Table_Delimited[1]/Record_Delimited/Field_Delimited[1]**	

		2) **/Product_Observational/File_Area_Observational/Table_Delimited[1]** **/Record_Delimited/Field_Delimited[2]** **3)** **/Product_Observational/File_Area_Observational/Table_Delimited[1]** **/Record_Delimited/Field_Delimited[3]** **4)** **/Product_Observational/File_Area_Observational/Table_Delimited[1]** **/Record_Delimited/Field_Delimited[4]** **5)** **/Product_Observational/File_Area_Observational/Table_Delimited[2]** **/Record_Delimited/Field_Delimited[1]** **6)** **/Product_Observational/File_Area_Observational/Table_Delimited[2]** **/Record_Delimited/Field_Delimited[2]** **7)** **/Product_Observational/File_Area_Observational/Table_Delimited[2]** **/Record_Delimited/Field_Delimited[3]** **8)** **/Product_Observational/File_Area_Observational/Table_Delimited[3]** **/Record_Delimited/Field_Delimited[1]** **9)** **/Product_Observational/File_Area_Observational/Table_Delimited[3]** **/Record_Delimited/Field_Delimited[2]** **10)** **/Product_Observational/File_Area_Observational/Table_Delimited[3]** **/Record_Delimited/Field_Delimited[3]** **11)** **/Product_Observational/File_Area_Observational/Table_Delimited[3]** **/Record_Delimited/Field_Delimited[4]**	
		1) *name* 2) *field_number* 3) *data_type*	

		4) *maximum_field_length* 5) *field_format* 6) *unit* 7) *scaling_factor* 8) *value_offset* 9) *description* 10) *associated_Special_Constants* 11) *associated_Statistics*	
field_delimiter	The field_delimiter attribute provides the character that marks the boundary between two fields in a delimited table.	**1) /Product_Observational/File_Area_Observational/Table_Delimited[1]/field_delimiter** **2) /Product_Observational/File_Area_Observational/Table_Delimited[2]/field_delimiter** **3) /Product_Observational/File_Area_Observational/Table_Delimited[3]/field_delimiter**	
		1) Comma 2) Horizontal Tab 3) Semicolon 4) Vertical Bar 5) comma 6) horizontal tab 7) semicolon 8) vertical bar	ASCII_Short_String_Collapsed
File	The File class consists of attributes that describe a file in a data store.	**1) /Product_Observational/File_Area_Observational/File**	
		1) *file_name* 2) *local_identifier* 3) *creation_date_time* 4) *file_size* 5) *records* 6) *md5_checksum* 7) *comment* 8) *data_object*	
File_Area_Browse	The File Area Browse class describes a file and one or more tagged_data_objects contained within the file.	**1) /Product_Browse/File_Area_Browse**	
		1) *has_File* 2) *has_tagged_data_object*	

File_Area_Observational	The File Area Observational class describes, for an observational product, a file and one or more tagged_data_objects contained within the file.	**1) /Product_Observational/File_Area_Observational**	
		1) *has_File* 2) *has_composite_structure* 3) *has_tagged_data_object*	
File_Area_Observational_Supplemental	The File Area Observational Supplemental class describes, for an observational product, additional files and tagged_data_objects contained within the file.	**1) /Product_Observational/File_Area_Observational_Supplemental[1]** **2) /Product_Observational/File_Area_Observational_Supplemental[2]**	
		1) *has_File* 2) *has_composite_structure* 3) *has_tagged_data_object*	
File_Area_Text	The File Area Text class describes a file that contains a text stream object.	**1) /Product_File_Text/File_Area_Text**	
		1) *has_File* 2) *has_tagged_data_object*	
file_size	The file_size attribute provides the size of the file.	**1) /Product_Observational/File_Area_Observational/File/file_size**	
			ASCII_NonNegative_Integer *Units_of_Storage*
img:**Filter**	The Filter class describes the filter associated with a particular observation. The filter may be identified by name, identifier, number or some combination of these.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Filter**	
		1) *filter_name* 2) *filter_id* 3) *filter_number* 4) *bandwidth* 5) *center_filter_wavelength* 6) *comment*	
img:**Frame_Parameters**	The Frame_Parameters class contains attributes providing information specific to an image frame. A frame consists of a sequence of measurements made over a specified time interval, and may include measurements from different instrument modes.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Frame_Parameters**	
		1) *frame_id* 2) *frame_type_name* 3) *interframe_delay*	

geom:**Geometry**	The Geometry class is a container for all geometric information in the label. The Image_Display_Geometry class should have one instance if the primary data object is an Array object for which two of the dimensions are suitable for display in the vertical (line) and horizontal (sample) dimensions of a display device. Multiple instances of the Image_Display_Geometry class are only appropriate if the data product contains multiple Array objects and the orientations of the various objects are not the same.	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry**	
		1) *SPICE_Kernel_Files* 2) *Expanded_Geometry* 3) *Image_Display_Geometry* 4) *Geometry_Orbiter* 5) *Geometry_Lander*	
geom:**Geometry_Lander**	The Geometry_Lander class is a container for all geometric information in the label relating to a landed spacecraft, including rovers.	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander**	
		1) *Articulation_Device_Parameters* 2) *Camera_Model_Parameters* 3) *Coordinate_Space_Definition* 4) *Derived_Geometry* 5) *Motion_Counter*	
img_surface:**Geometry_Projection_Parameters**	The Geometry_Projection_Parameters describes the geometric projection or warping the image has undergone. It is not the intent of this class to describe map projections, but rather image warps such as linearization (stereo epipolar alignment), geometric sensor correction, or rubber-sheeting. If present, a linearization partner image can be referenced using either an Internal_Reference or External_Reference.	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Imaging_Parameters/Geometry_Projection_Parameters**	
		1) *linearization_mode* 2) *linearization_mode_fov* 3) *geometry_projection_type* 4) *External_Reference*	
disp:**green_channel_band**	The green_channel_band attribute identifies the number of the band, along the band axis, that should be loaded, by default, into the green channel of a display device. The first band along the band axis has band number 1.	**1) /Product_Observational/Observation_Area/Discipline_Area/Display_Settings/Color_Display_Settings/green_channel_band**	
			ASCII_Integer
Header	The Header class describes a data object header.	**1) /Product_Observational/File_Area_Observational/Header**	
		1) *name* 2) *object_length* 3) *offset* 4) *local_identifier* 5) *parsing_standard_id* 6) *md5_checksum* 7) *description* 8) *data_object*	

cart:**Horizontal_Coordinate_System_Definition**	The Horizontal_Coordinate_System_Definition class provides the reference frame or system from which linear or angular quantities are measured and assigned to the position that a point occupies.	**1) /Product_Observational/Observation_Area/Discipline_Area/Cartography/Spatial_Reference_Information/Horizontal_Coordinate_System_Definition**	
		1) *has_Geographic* 2) *has_Geodetic_Model*	
disp:**horizontal_display_axis**	The horizontal_display_axis attribute identifies, by name, the axis of an Array (or Array subclass) that is intended to be displayed in the horizontal or "sample" dimension on a display device. The value of this attribute must match the value of one, and only one, axis_name attribute in an Axis_Array class of the associated Array.	**1) /Product_Observational/Observation_Area/Discipline_Area/Display_Settings/Display_Direction/horizontal_display_axis**	
			ASCII_Short_String_Collapsed
disp:**horizontal_display_direction**	The horizontal_display_direction attribute specifies the direction across the screen of a display device that data along the horizontal axis of an Array is supposed to be displayed.	**1) /Product_Observational/Observation_Area/Discipline_Area/Display_Settings/Display_Direction/horizontal_display_direction**	
		1) Left to Right 2) Right to Left	ASCII_Short_String_Collapsed
Identification_Area	The identification area consists of attributes that identify and name an object.	**1) /Product_Observational/Identification_Area**	
		1) *logical_identifier* 2) *version_id* 3) *title* 4) *information_model_version* 5) *product_class* 6) *alias_list* 7) *citation_information* 8) *modification_history*	
img:**Image_Compression_Parameters**	The Image_Compression_Parameters class contains attributes describing onboard compression parameters used for data storage and transmission.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Compression_Parameters**	
		1) *compression_class* 2) *compression_mode* 3) *compression_type* 4) *compression_rate* 5) *compression_ratio* 6) *compression_quality* 7) *deferred_flag* 8) *error_pixel_count* 9) *ICER_Parameters*	

img_surface:**Image_Identifiers**	The Image_Identifiers class contains items that help to identify the image or guide how processing should be done to the image.	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Imaging_Parameters/Image_Identifiers** 1) *image_id* 2) *mosaic_id* 3) *mesh_id* 4) *stereo_match_id*
img:**Image_Product_Information**	The Image_Product_Information class contains classes and attributes that describe the image product itself, including information about the exposure duration, filters, data correction, sampling, frame, sub-frames, and how the product was derived.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information** 1) *Autoexposure_Parameters* 2) *Exposure_Parameters* 3) *Data_Correction_Parameters* 4) *Filter* 5) *Color_Filter_Array_Parameters* 6) *Sampling_Parameters* 7) *Downsampling_Parameters* 8) *Frame_Parameters* 9) *Subframe_Parameters* 10) *Color_Parameters*
img:**Imaging**	The Imaging class contains classes and attributes describing both the image product itself and the imaging instrument. Image product information can include exposure duration, filters, data correction, sampling, frame, sub-frames, and how the product was derived. For the imaging instrument, information can be provided describing the dynamic physical or operating characteristics of the imaging instrument.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging** 1) *Local_Internal_Reference* 2) *Command_Parameters* 3) *Image_Product_Information* 4) *Imaging_Instrument_State_Parameters* 5) *Image_Compression_Parameters*
img:**Imaging_Instrument_State_Parameters**	The Imaging_Instrument_State_Parameters class contains attributes providing the values of any dynamic physical or operating characteristics of the imaging instrument.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Imaging_Instrument_State_Parameters** 1) *analog_offset* 2) *sample_fov* 3) *line_fov* 4) *detector_first_line* 5) *detector_first_sample* 6) *detector_lines* 7) *detector_to_image_rotation*

		8) *gain_mode_id* 9) *gain_number* 10) *Instrument_Device_Current* 11) *Instrument_Device_Temperature* 12) *Instrument_Device_Voltage*	
information_model_version	The information_model_version attribute provides the version identification of the PDS Information Model on which the label and schema are based.	**1) /Product_Observational/Identification_Area/information_model_version**	
		1) 1.0.0.0 2) 1.1.0.0 3) 1.10.0.0 4) 1.2.0.0 5) 1.2.0.1 6) 1.3.0.0 7) 1.3.0.1 8) 1.4.0.0 9) 1.5.0.0 10) 1.6.0.0 11) 1.7.0.0 12) 1.8.0.0 13) 1.9.0.0 14) 1.9.1.0	ASCII_Short_String_Collapsed
proc:**Input_Product**	The Input_Product class describes one of the product most directly used as input to software for product creation, including raw, partially-processed, calibrated, or derived products.	**1) /Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Input_Product_List/Input_Product**	
		1) *local_identifier* 2) *External_Reference*	
proc:**Input_Product_List**	The Input_Product_List class describes all of the product(s) most directly used as input to software for product creation, including raw, partially-processed, calibrated, or derived products. These Input Products can be explicitly described in this label using the Input_Product class, and/or a list of products can be specified in another product referenced by the Internal_Reference or Local_Internal_Reference.	**1) /Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Input_Product_List**	
		1) *Input_Product*	
img:**Instrument_Device_Temperature**	The Instrument_Device_Temperature class provides a container for the set of temperatures of some point on an instrument or other device.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Imaging_Instrument_State_Parameters/Instrument_Device_Temperature**	

		1) *Instrument_Device_Temperature_Index*	
img:**Instrument_Device_Temperature_Index**	The Instrument_Device_Temperature_Index class provides the temperature of some point on an instrument or other device.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Imaging_Instrument_State_Parameters/Instrument_Device_Temperature/Instrument_Device_Temperature_Index[1]** **2) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Imaging_Instrument_State_Parameters/Instrument_Device_Temperature/Instrument_Device_Temperature_Index[2]**	
		1) *device_name* 2) *raw_count*	
img_surface:**Instrument_Information**	The Instrument_Information class specifies information about the configuration of the instrument as it acquired this observation.	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Imaging_Parameters/Instrument_Information**	
		1) *image_type* 2) *image_acquire_mode* 3) *instrument_mode_id* 4) *instrument_serial_number* 5) *instrument_version_number* 6) *camera_product_id* 7) *camera_product_id_count*	
Internal_Reference	The Internal_Reference class is used to cross-reference other products in the PDS registry system.	**1) /Product_Observational/Observation_Area/Investigation_Area/Internal_Reference** **2) /Product_Observational/Observation_Area/Observing_System/Observing_System_Component[1]/Internal_Reference** **3) /Product_Observational/Observation_Area/Observing_System/Observing_System_Component[2]/Internal_Reference** **4) /Product_Observational/Observation_Area/Target_Identification/Internal_Reference**	

		5) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Data_Correction_Parameters/Data_Correction[3]/Data_Correction_File/Internal_Reference **6) /Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Input_Product_List/Input_Product/Internal_Reference** **7) /Product_Observational/Reference_List/Internal_Reference**	
		1) *lid_reference* 2) *reference_type* 3) *comment*	
Investigation_Area	The Investigation_Area class provides information about an investigation (mission, observing campaign or other coordinated, large-scale data collection effort).	**1) /Product_Observational/Observation_Area/Investigation_Area**	
		1) *name* 2) *type* 3) *internal_reference*	
img:**JPEG_Parameters**	The JPEG_Parameters class contains attributes describing onboard compression parameters specific to Joint Photographic Experts Group (JPEG) image compression.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Compression_Parameters/JPEG_Parameters**	
		1) *color_subsampling_mode* 2) *jpeg_quality* 3) *jpeg_parameter*	
cart:**lander_map_projection_name**	The map_projection_name attribute provides the name of the map projection.	**1) /Product_Observational/Observation_Area/Discipline_Area/Cartography/Spatial_Reference_Information/Horizontal_Coordinate_System_Definition/Local/Map_Projection_Lander/lander_map_projection_name**	
		1) Cylindrical 2) Vertical 3) Perspective 4) Polar 5) Orthographic 6) Orthorectified 7) Cylindrical Perspective	ASCII_Short_String_Collapsed
lidvid_reference	The lidvid_reference attribute provides the logical_identifier plus version_id, which uniquely identifies a product.	**1) /Product_Observational/Reference_List/Internal_Reference/lidvid_reference**	

		2) /Product_Observational/Reference_List/Source_Product_Internal/lidvid_reference	
			ASCII_LIDVID
cart:**Local**	The Local class provides a description of any coordinate system that is not aligned with the surface of the planet.	**1) /Product_Observational/Observation_Area/Discipline_Area/Cartography/Spatial_Reference_Information/Horizontal_Coordinate_System_Definition/Local**	
		1) *local_description* 2) *local_georeference_information*	
cart:**local_description**	The local_description attribute provides a description of the coordinate system and its orientation to the surface of a planet.	**1) /Product_Observational/Observation_Area/Discipline_Area/Cartography/Spatial_Reference_Information/Horizontal_Coordinate_System_Definition/Local/local_description**	
			ASCII_Text_Preserved
local_identifier	The local_identifier attribute provides a character string which uniquely identifies the containing object within the label.	**1) /Product_Browse/File_Area_Browse/File/local_identifier** **2) /Product_Browse/File_Area_Browse/Encoded_Image/local_identifier**	
			ASCII_Local_Identifier
Local_Internal_Reference	The Local Internal_Reference class is used to cross-reference other Description Objects in a PDS4 label.	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Camera_Model_Parameters/Coordinate_Space_Reference/Local_Internal_Reference** **2) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Coordinate_Space_Definition[2]/Coordinate_Space_Reference/Local_Internal_Reference** **3) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Derived_Geometry[1]/Coordinate_Space_Reference/Local_Internal_Reference**	

		4) **/Product_Observational/Observation_Area/Discipline_Area/Imaging/Local_Internal_Reference** **5)** **/Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Local_Internal_Reference** **6)** **/Product_Observational/Observation_Area/Discipline_Area/Display_Settings/Local_Internal_Reference**	
		1) *comment* 2) *local_identifier_reference* 3) *local_reference_type*	
local_reference_type	The local_reference_type attribute provides the name of an association between an entity identified by a local_identifier_reference and another corresponding entity identified by a local_identifier. The values for the local_reference_type are expected to be enumerated for appropriate contexts in the Schematron files of local (i.e., discipline and mission) data dictionaries.	**1)** **/Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Camera_Model_Parameters/Coordinate_Space_Reference/Local_Internal_Reference/local_reference_type** **2)** **/Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Coordinate_Space_Definition[2]/Coordinate_Space_Reference/Local_Internal_Reference/local_reference_type** **3)** **/Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Derived_Geometry[1]/Coordinate_Space_Reference/Local_Internal_Reference/local_reference_type** **4)** **/Product_Observational/Observation_Area/Discipline_Area/Imaging/Local_Internal_Reference/local_reference_type** **5)** **/Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Local_Internal_Reference/local_reference_type** **6)** **/Product_Observational/Observation_Area/Discipline_Area/Display_Settings/Local_Internal_Reference/local_reference_type**	
			ASCII_Short_String_Collapsed

logical_identifier	A logical identifier identifies the set of all versions of an object. It is an object identifier without a version.	**1) /Product_Observational/Identification_Area/logical_identifier**	
			ASCII_Short_String_Collapsed
cart:**Map_Projection_Lander**	The Map_Projection class provides the systematic representation of all or part of the surface of a planet on a plane or developable surface from the perspective of an in-situ spacecraft.	**1) /Product_Observational/Observation_Area/Discipline_Area/Cartography/Spatial_Reference_Information/Horizontal_Coordinate_System_Definition/Local/Map_Projection_Lander**	
		1) *lander_map_projection_name* 2) *Cylindrical*	
cart:**maximum_elevation**	The maximum_elevation attribute specifies the elevation (as defined by the coordinate system) of the first line of the image. For the Polar projection, specifies the highest elevation used, i.e. the elevation of the outermost circle of pixels. Applies to lander map projections Cylindrical, Polar, Sinusoidal, Perspective and Cylindrical-Perspective.	**1) /Product_Observational/Observation_Area/Discipline_Area/Cartography/Spatial_Reference_Information/Horizontal_Coordinate_System_Definition/Local/Map_Projection_Lander/Cylindrical/maximum_elevation**	
			ASCII_Real *Units_of_Angle*
md5_checksum	The md5_checksum attribute is the 32-character hexadecimal number computed using the MD5 algorithm for the contiguous bytes of single digital object (as stored) or for an entire file.	**1) /Product_Observational/File_Area_Observational/File/md5_checksum**	
			ASCII_MD5_Checksum
cart:**minimum_elevation**	The minimum_elevation attribute specifies the elevation (as defined by the coordinate system) of the last line of the image for Cylindrical map projections. Applies to Cylindrical, Perspective and Cylindrical-Perspective lander map projections.	**1) /Product_Observational/Observation_Area/Discipline_Area/Cartography/Spatial_Reference_Information/Horizontal_Coordinate_System_Definition/Local/Map_Projection_Lander/Cylindrical/minimum_elevation**	
			ASCII_Real *Units_of_Angle*
Mission_Area	The mission area allows the insertion of mission specific metadata.	**1) /Product_Observational/Observation_Area/Mission_Area**	
msn:**Mission_Information**	The Mission Information class provides a set of optional attributes that have their value sets defined by the mission.	**1) /Product_Observational/Observation_Area/Mission_Area/Mission_Information**	
		1) *mission_phase_name*	

		2) *mission_phase_identifier* 3) *start_orbit_number* 4) *stop_orbit_number* 5) *spacecraft_clock_start_count* 6) *spacecraft_clock_stop_count*	
modification_date	The modification_date attribute provides date the modifications were completed	**1) /Product_Observational/Identification_Area/Modification_History/Modification_Detail/modification_date**	
			ASCII_Date_YMD
Modification_Detail	The Modification_Detail class provides the details of one round of modification for the product. The first, required, instance of this class documents the date the product was first registered.	**1) /Product_Observational/Identification_Area/Modification_History/Modification_Detail**	
		1) *modification_date* 2) *version_id* 3) *description*	
Modification_History	The Modification_History class tracks the history of changes made to the product once it enters the registry system.	**1) /Product_Observational/Identification_Area/Modification_History**	
		1) *modification_detail*	
geom:**Motion_Counter**	The Motion_Counter class provides a set of integers that describe a (potentially) unique location (position / orientation) for a rover or other movable object. Each time an event occurs that results in a movement, a new motion counter value is created. This includes intentional motion due to drive commands, as well as potential motion due to other articulating devices, such as arms or antennae. This motion counter (or part of it) is used as a reference to define instances of coordinate systems that can move such as SITE or ROVER frames. The motion counter is defined in a mission-specific manner. Although the original intent was to have incrementing indices (e.g., MER), the motion counter could also contain any integer values that conform to the above definition, such as time or spacecraft clock values.	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Motion_Counter**	
		1) *name* 2) *local_identifier* 3) *Motion_Counter_Index*	
geom:**Motion_Counter_Index**	The Motion_Counter_Index class identifies and populates one element of a Motion_Counter list. The class should be repeated for each element of the list.	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Motion_Counter/Motion_Counter_Index[1]** **2) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Motion_Counter/Motion_Counter_Index[2]**	

		1) *index_value_number* 2) *index_id*	
name	The name attribute provides a word or combination of words by which the object is known.	**1) /Product_Observational/Observation_Area/Investigation_Area/name** **2) /Product_Observational/Observation_Area/Observing_System/Observing_System_Component[1]/name** **3) /Product_Observational/Observation_Area/Observing_System/Observing_System_Component[2]/name** **4) /Product_Observational/Observation_Area/Target_Identification/name**	
			UTF8_Short_String_Collapsed
object_length	The object_length attribute provides the length of the digital object in bytes.	**1) /Product_Observational/File_Area_Observational/Header/object_length**	
			ASCII_NonNegative_Integer *Units_of_Storage*
Observation_Area	The observation area consists of attributes that provide information about the circumstances under which the data were collected.	**1) /Product_Observational/Observation_Area**	
		1) *comment* 2) *has_time_coordinates* 3) *has_primary_result_description* 4) *has_investigation_area* 5) *has_observing_system* 6) *has_target_identification* 7) *has_mission_area* 8) *has_discipline_area*	
Observing_System	The Observing System class describes the entire suite used to collect the data.	**1) /Product_Observational/Observation_Area/Observing_System**	
		1) *name* 2) *description*	

		3) *observing_system_component* 4) *data_object*	
Observing_System_Component	The Observing System Component class references one or more subsystems used to collect data. A subsystem can be an instrument_host, instrument, or any other similar product. Each subsystem is categorized as either a sensor or a source. If the observing system includes both a sensor and a source, Observing System Component occurs twice (once for each type) otherwise it only occurs once.	**1) /Product_Observational/Observation_Area/Observing_System/Observing_System_Component[1]** **2) /Product_Observational/Observation_Area/Observing_System/Observing_System_Component[2]**	
		1) *name* 2) *type* 3) *description* 4) *internal_reference* 5) *external_reference*	
img:**onboard_B_b**	Specifies the factor that has been multiplied by the B pixel value after de-Bayering (demosaicking) takes place. This value is summed with the multiplied R and G pixel values to produce the output Blue value.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Color_Parameters/Onboard_Color_Matrix/onboard_B_b**	
			ASCII_Real
img:**onboard_B_g**	Specifies the factor that has been multiplied by the G pixel value after de-Bayering (demosaicking) takes place. This value is summed with the multiplied R and B pixel values to produce the output Blue value.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Color_Parameters/Onboard_Color_Matrix/onboard_B_g**	
			ASCII_Real
img:**onboard_B_r**	Specifies the factor that has been multiplied by the R pixel value after de-Bayering (demosaicking) takes place. This value is summed with the multiplied G and B pixel values to produce the output Blue value.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Color_Parameters/Onboard_Color_Matrix/onboard_B_r**	
			ASCII_Real
img:**Onboard_Color_Matrix**	The Onboard_Color_Matrix class represents a 3x3 matrix that is used onboard to perform color correction. It is done after de-Bayering, as all three color bands are needed for each pixel. The first three elements are multiplied by the R,G,B (respectively) pixel values and summed to get the output Red pixel value. Similarly, the second three create the output Green, and the last three the output Blue. If the label is not present, no correction was performed.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Color_Parameters/Onboard_Color_Matrix**	
		1) *onboard_R_r* 2) *onboard_R_g* 3) *onboard_R_b*	

		4) *onboard_G_r* 5) *onboard_G_g* 6) *onboard_G_b* 7) *onboard_B_r* 8) *onboard_B_g* 9) *onboard_B_b*	
img:**onboard_G_b**	Specifies the factor that has been multiplied by the B pixel value after de-Bayering (demosaicking) takes place. This value is summed with the multiplied R and G pixel values to produce the output Green value.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Color_Parameters/Onboard_Color_Matrix/onboard_G_b**	
			ASCII_Real
img:**onboard_G_g**	Specifies the factor that has been multiplied by the G pixel value after de-Bayering (demosaicking) takes place. This value is summed with the multiplied R and B pixel values to produce the output Green value.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Color_Parameters/Onboard_Color_Matrix/onboard_G_g**	
			ASCII_Real
img:**onboard_G_r**	Specifies the factor that has been multiplied by the R pixel value after de-Bayering (demosaicking) takes place. This value is summed with the multiplied G and B pixel values to produce the output Green value.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Color_Parameters/Onboard_Color_Matrix/onboard_G_r**	
			ASCII_Real
img:**onboard_R_b**	Specifies the factor that has been multiplied by the B pixel value after de-Bayering (demosaicking) takes place. This value is summed with the multiplied R and G pixel values to produce the output Red value.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Color_Parameters/Onboard_Color_Matrix/onboard_R_b**	
			ASCII_Real
img:**onboard_R_g**	Specifies the factor that has been multiplied by the G pixel value after de-Bayering (demosaicking) takes place. This value is summed with the multiplied R and B pixel values to produce the output Red value.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Color_Parameters/Onboard_Color_Matrix/onboard_R_g**	
			ASCII_Real
img:**onboard_R_r**	Specifies the factor that has been multiplied by the R pixel value after de-Bayering (demosaicking) takes place. This value is summed with the multiplied G and B pixel values to produce the output Red value.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Color_Parameters/Onboard_Color_Matrix/onboard_R_r**	

			ASCII_Real
img:**Onboard_Responsivity**	The Onboard_Responsivity class specifies factors that have been applied to the R, G, and B cells (respectively) of the Bayer pattern, before de-Bayering (demosaicking) takes place. The intent of these is to approximately balance the filters so the de-Bayering process is not skewed, and EDR/ILT products look reasonable before full radiometric or color correction is done on the ground. If these factors are not present, no correction was performed.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Color_Parameters/Onboard_Responsivity**	
		1) *responsivity_r* 2) *responsivity_g* 3) *responsivity_b*	
geom:**Optical_Terms**	The Optical_Terms provides the optical axis coefficients used for lens-distortion correction when the distortion is radial.	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Camera_Model_Parameters/CAHVOR_Model/Optical_Terms**	
		1) *c0* 2) *c1* 3) *c2*	
cart:**Orthorectified**	null	**1) /Product_Observational/Observation_Area/Discipline_Area/Cartography/Spatial_Reference_Information/Horizontal_Coordinate_System_Definition/Local/Map_Projection_Lander/Orthorectified**	
		1) *pixel_resolution_x* 2) *pixel_resolution_y* 3) *x_axis_maximum* 4) *x_axis_minimum* 5) *y_axis_maximum* 6) *y_axis_minimum* 7) *Pixel_Position_Origin* 8) *Vector_Projection_Origin* 9) *Vector_Projection_X_Axis* 10) *Vector_Projection_Y_Axis* 11) *Vector_Projection_Z_Axis*	
proc:**Parameter**	The Parameter class describes any information about software program execution. Examples of information that can be captured here are software input arguments, software output arguments, log information, and references to specific data products. This class is intended to be freeform to allow data providers the ability to specify information they determine	**1) /Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[2]/Software_Program_Parameters/Parameter[1]** **2) /Product_Observational/Observation_Area/Discipline_Area/Processin**	

	applicable and useful for their data processing software and data products.	**g_Information/Process/Software/Software_Program[2]/Software_Program_Parameters/Parameter[2]** **3) /Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[3]/Software_Program_Parameters/Parameter[1]** **4) /Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[3]/Software_Program_Parameters/Parameter[2]** **5) /Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[3]/Software_Program_Parameters/Parameter[3]** **6) /Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[4]/Software_Program_Parameters/Parameter[1]** **7) /Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[4]/Software_Program_Parameters/Parameter[2]** **8) /Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[4]/Software_Program_Parameters/Parameter[3]** **9) /Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[4]/Software_Program_Parameters/Parameter[4]** **10) /Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[5]/Software_Program_Parameters/Parameter[1]**

		11) **/Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[5]/Software_Program_Parameters/Parameter[2]** **12)** **/Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[5]/Software_Program_Parameters/Parameter[3]** **13)** **/Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[5]/Software_Program_Parameters/Parameter[4]** **14)** **/Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[6]/Software_Program_Parameters/Parameter[1]** **15)** **/Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[6]/Software_Program_Parameters/Parameter[2]** **16)** **/Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[6]/Software_Program_Parameters/Parameter[3]** **17)** **/Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[6]/Software_Program_Parameters/Parameter[4]**
		1) *name* 2) *parameter_type* 3) *value* 4) *External_Reference*
parsing_standard_id	The parsing_standard_id attribute provides the formal name of a standard used for the structure of a Parsable Byte Stream digital object.	**1)** **/Product_Observational/File_Area_Observational/Header/parsing_standard_id**

		1) 7-Bit ASCII Text 2) CDF 3.4 ISTP/IACG 3) FITS 3.0 4) ISIS2 5) ISIS2 History Label 6) ISIS3 7) PDS DSV 1 8) PDS ODL 2 9) PDS3 10) Pre-PDS3 11) UTF-8 Text 12) VICAR1 13) VICAR2	ASCII_Short_String_Collapsed
img:**Pixel_Averaging_Dimensions**	The Pixel_Averaging class provides the height and width, in pixels, of the area over which pixels were averaged prior to image compression.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Downsampling_Parameters/Pixel_Averaging_Dimensions**	
		1) *height_pixels* 2) *width_pixels*	
cart:**Pixel_Position_Origin**	The Pixel_Position_Origin class specifies the sample coordinate of the location in the image of the "special" point of the mosaic. For Vertical, Orthographic and Orthorectified projections, this is the origin of the projected coordinate system, corresponding to the Vector_Projection_Origin. In PDS3, this information was specified using the LINE_PROJECTION_OFFSET and SAMPLE_PROJECTION_OFFSET keywords.	**1) /Product_Observational/Observation_Area/Discipline_Area/Cartography/Spatial_Reference_Information/Horizontal_Coordinate_System_Definition/Local/Map_Projection_Lander/Orthorectified/Pixel_Position_Origin**	
		1) *line* 2) *sample*	
cart:**pixel_resolution_x**	The pixel_resolution_x and pixel_resolution_y attributes indicate the image array pixel resolution (distance/pixel or degree/pixel) relative to the Cartesian (x,y) coordinate system as defined by the map projection. Due to varying properties across different map projections, actual surface distances for an individual pixel may be accurate only at specific location(s) within the image array (e.g. reference latitude or longitude, standard parallels, etc). For most PDS products, x and y resolution values are equal ('square' pixels). The inclusion of both x and y attributes allows for anticipated products where resolution may differ for each axis ('rectangular' pixels). NOTE: Definition of this PDS4 attribute differs from how 'resolution' was defined within PDS3.	**1) /Product_Observational/Observation_Area/Discipline_Area/Cartography/Spatial_Reference_Information/Horizontal_Coordinate_System_Definition/Local/Map_Projection_Lander/Orthorectified/pixel_resolution_x**	
			ASCII_Real *Units_of_Pixel_Resolution_Map*
cart:**pixel_resolution_y**	The pixel_resolution_x and pixel_resolution_y attributes indicate the image array pixel resolution (distance/pixel or	**1) /Product_Observational/Observation_Area/Discipline_Area/Cartograp**	

	degree/pixel) relative to the Cartesian (x,y) coordinate system as defined by the map projection. Due to varying properties across different map projections, actual surface distances for an individual pixel may be accurate only at specific location(s) within the image array (e.g. reference latitude or longitude, standard parallels, etc). For most PDS products, x and y resolution values are equal ('square' pixels). The inclusion of both x and y attributes allows for anticipated products where resolution may differ for each axis ('rectangular' pixels). NOTE: Definition of this PDS4 attribute differs from how 'resolution' was defined within PDS3.	**hy/Spatial_Reference_Information/Horizontal_Coordinate_System_Definition/Local/Map_Projection_Lander/Orthorectified/pixel_resolution_y**	
			ASCII_Real *Units_of_Pixel_Resolution_Map*
cart:**pixel_scale_x**	The pixel_scale_x and pixel_scale_y attributes indicate the image array pixel scale (pixel/degree or pixel/distance) relative to the Cartesian (x,y) coordinate system as defined by the map projection. Due to varying properties across different map projections, actual surface distances for an individual pixel may be accurate only at specific location(s) within the image array (e.g. reference latitude or longitude, standard parallels, etc). For most PDS products, x and y scale values are equal ('square' pixels). The inclusion of both x and y attributes allows for anticipated products where scale may differ for each axis ('rectangular' pixels). NOTE1: For presentation of hard-copy maps, a map scale is traditionally expressed as a 'representative fraction' (the ratio of a hard-copy map to the actual subject surface (e.g. 1:250,000, where one unit of measure on the map equals 250,000 of the same unit on the body surface)). This usage is relevant when map/data are presented on hard-copy media (paper, computer screen,etc). When defining pixel scale within a stored image/array context here, we are expressing a ratio between the image array and the actual surface (thus, pixel/degree or pixel/distance units). NOTE2: Definition of this PDS4 attribute differs from how 'scale' was defined within PDS3	**1) /Product_Observational/Observation_Area/Discipline_Area/Cartography/Spatial_Reference_Information/Horizontal_Coordinate_System_Definition/Local/Map_Projection_Lander/Cylindrical/pixel_scale_x**	
			ASCII_Real *Units_of_Pixel_Scale_Map*
cart:**pixel_scale_y**	The pixel_scale_x and pixel_scale_y attributes indicate the image array pixel scale (pixel/degree or pixel/distance) relative to the Cartesian (x,y) coordinate system as defined by the map projection. Due to varying properties across different map projections, actual surface distances for an individual pixel may be accurate only at specific location(s) within the image array (e.g. reference latitude or longitude, standard parallels, etc). For most PDS products, x and y scale values are equal ('square' pixels). The inclusion of both x and y attributes allows for anticipated products where scale may differ for each axis ('rectangular' pixels). NOTE1: For presentation of hard-copy maps, a map scale is traditionally expressed as a	**1) /Product_Observational/Observation_Area/Discipline_Area/Cartography/Spatial_Reference_Information/Horizontal_Coordinate_System_Definition/Local/Map_Projection_Lander/Cylindrical/pixel_scale_y**	
			ASCII_Real *Units_of_Pixel_Scale_Map*

	'representative fraction' (the ratio of a hard-copy map to the actual subject surface (e.g. 1:250,000, where one unit of measure on the map equals 250,000 of the same unit on the body surface)). This usage is relevant when map/data are presented on hard-copy media (paper, computer screen,etc). When defining pixel scale within a stored image/array context here, we are expressing a ratio between the image array and the actual surface (thus, pixel/degree or pixel/distance units). NOTE2: Definition of this PDS4 attribute differs from how 'scale' was defined within PDS3		
img_surface:**Placement_Target_Instrument**	Indicates the instrument that is referred to by the product. This is not the same as the instrument that acquired the product. For example, on InSight instrument placement products, it defines which instrument is being placed.	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Imaging_Parameters/Derived_Product_Parameters/Placement_Target_Instrument**	
		1) *name* 2) *Internal_Reference*	
Primary_Result_Summary	The Primary_Result_Summary class provides a high-level description of the types of products included in the collection or bundle	**1) /Product_Observational/Observation_Area/Primary_Result_Summary**	
		1) *type* 2) *purpose* 3) *data_regime* 4) *processing_level* 5) *processing_level_id* 6) *description* 7) *has_Science_Facet*	
proc:**Process**	The Process class describes one of the software processes used to produce the data product referenced in the parent Processing_Information class. This class includes descriptions of the process owner as well as the data processing software used to create the data product.	**1) /Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process**	
		1) *name* 2) *description* 3) *process_owner_name* 4) *process_owner_institution_name* 5) *Software*	
proc:**process_owner_institution_name**	The pprocess_owner_institution_name attribute specifies the name of the institution that owns the software process.	**1) /Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/process_owner_institution_name**	
			ASCII_Short_String_Collapsed

proc:**Processing_Information**	The Processing_Information class contains detailed information regarding the history of processing of the data product(s) described in the label. Information that can be specified using this class includes input products used to create a specific data product and the software and processes used to produce that product.	**1) /Product_Observational/Observation_Area/Discipline_Area/Processing_Information**	
		1) *Local_Internal_Reference* 2) *Input_Product_List*	
processing_level	The processing_level attribute provides a broad classification of data processing level.	**1) /Product_Observational/Observation_Area/Primary_Result_Summary/processing_level**	
		1) Calibrated 2) Derived 3) Partially Processed 4) Raw 5) Telemetry	ASCII_Short_String_Collapsed
product_class	The product_class attribute provides the name of the product class.	**1) /Product_Observational/Identification_Area/product_class**	
		1) Product_AIP 2) Product_Ancillary 3) Product_Attribute_Definition 4) Product_Browse 5) Product_Bundle 6) Product_Class_Definition 7) Product_Collection 8) Product_Context 9) Product_DIP 10) Product_DIP_Deep_Archive 11) Product_Data_Set_PDS3 12) Product_Document 13) Product_File_Repository 14) Product_File_Text 15) Product_Instrument_Host_PDS3 16) Product_Instrument_PDS3 17) Product_Metadata_Supplemental 18) Product_Mission_PDS3 19) Product_Native 20) Product_Observational 21) Product_Proxy_PDS3 22) Product_SIP 23) Product_SIP_Deep_Archive 24) Product_SPICE_Kernel 25) Product_Service	ASCII_Short_String_Collapsed

		26) Product_Software 27) Product_Subscription_PDS3 28) Product_Target_PDS3 29) Product_Thumbnail 30) Product_Update 31) Product_Volume_PDS3 32) Product_Volume_Set_PDS3 33) Product_XML_Schema 34) Product_Zipped	
msn:**product_type_name**	The product_type_name identifies a group of data products within a collection that have some property in common, such as processing level, resolution, or instrument-specific setting.	**1) /Product_Observational/Observation_Area/Mission_Area/Mission_Information/product_type_name**	
			ASCII_Short_String_Collapsed
proc:**program_start_date_time**	The program_start_date_time specifies the datetime for the start of the software program execution.	**1) /Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[1]/program_start_date_time** **2) /Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[2]/program_start_date_time** **3) /Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[3]/program_start_date_time** **4) /Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[4]/program_start_date_time** **5) /Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[5]/program_start_date_time** **6) /Product_Observational/Observation_Area/Discipline_Area/Processin**	

		g_Information/Process/Software/Software_Program[6]/program_start_date_time	
			ASCII_Date_Time_YMD_UTC
proc:**program_type_name**	The program_type_name attribute specifies the type of software program used for this software processing. Some examples include: VICAR, ISIS, GDAL.	**1) /Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[1]/program_type_name** **2) /Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[2]/program_type_name** **3) /Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[3]/program_type_name** **4) /Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[4]/program_type_name** **5) /Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[5]/program_type_name** **6) /Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[6]/program_type_name**	
			ASCII_Short_String_Collapsed
proc:**program_user**	The program_user attribute specifies the username of the person responsible for running the software prgoram.	**1) /Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[1]/program_user**	

		2) **/Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[2]/program_user** **3)** **/Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[3]/program_user** **4)** **/Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[4]/program_user** **5)** **/Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[5]/program_user** **6)** **/Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[6]/program_user**	
			ASCII_Short_String_Collapsed
publication_year	The publication_year attribute provides the year in which the product should be considered as published. Generally, this will be the year the data were declared "Certified" or "Archived".	**1)** **/Product_File_Text/Identification_Area/Citation_Information/publication_year**	
			ASCII_Date_YMD
purpose	The purpose attribute provides an indication of the primary purpose of the observations included.	**1)** **/Product_Observational/Observation_Area/Primary_Result_Summary/purpose**	
		1) Calibration 2) Checkout 3) Engineering 4) Navigation 5) Observation Geometry 6) Science	ASCII_Short_String_Collapsed
geom:**Quaternion_Model_Transform**	The Quaternion_Model_Transform class specifies, along with Vector_Model_Transform class, the transform used for the camera model in an image. Camera models created by the calibration process have associated with them a pose, comprised of the position (offset) and orientation (quaternion) of the camera at the time it was calibrated. The model is	**1)** **/Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Camera_Model_Parameters/Quaternion_Model_Transform**	
		1) *qcos*	

	transformed ("pointed") for a specific image by computing, generally using articulation device kinematics, a final pose for the image. The camera model is then translated and rotated from the calibration to final pose. This class specifies the quaternion portion of the final pose.	2) *qsin1* 3) *qsin2* 4) *qsin3*	
geom:**Quaternion_Plus_Direction**	Quaternion_Plus_Direction provides the four elements of a quaternion and its direction of rotation. The two end point frames must be identified in the enclosing class. See the defintion of Quaternion_Base for more details on the quaternion classes in this dictionary.	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Coordinate_Space_Definition[1]/Quaternion_Plus_Direction** **2) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Coordinate_Space_Definition[2]/Quaternion_Plus_Direction**	
		1) *qcos* 2) *qsin1* 3) *rotation_direction* 4) *qsin2* 5) *qsin3*	
geom:**Radial_Terms**	The Radial_Terms class provides the radial lens distortion coefficients defined in the ground (object) coordinate system.	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Camera_Model_Parameters/CAHVORE_Model/Radial_Terms**	
		1) *c0* 2) *c1* 3) *c2*	
img:**Radiometric_Correction_Parameters**	The Radiometric_Correction_Parameters class is a container for the type and details of the radiometric calibration performed on the product.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Data_Correction_Parameters/Data_Correction[2]/Radiometric_Correction_Parameters**	
		1) *radiometric_correction_type_name* 2) *radiance_scaling_factor* 3) *radiance_offset*	
Record_Delimited	The Record_Delimited class is a component of the delimited table (spreadsheet) class and defines a record of the delimited table.	**1) /Product_Observational/File_Area_Observational/Table_Delimited[1]/Record_Delimited**	

		2) **/Product_Observational/File_Area_Observational/Table_Delimited[2]/Record_Delimited** **3)** **/Product_Observational/File_Area_Observational/Table_Delimited[3]/Record_Delimited**	
		1) *fields* 2) *maximum_record_length* 3) *groups* 4) *has_Delimited_Field*	
record_delimiter	The record_delimiter attribute provides the character or characters used to indicate the end of a record.	**1)** **/Product_Observational/File_Area_Observational/Table_Delimited[1]/record_delimiter** **2)** **/Product_Observational/File_Area_Observational/Table_Delimited[2]/record_delimiter** **3)** **/Product_Observational/File_Area_Observational/Table_Delimited[3]/record_delimiter** **4)** **/Product_Observational/File_Area_Observational_Supplemental[1]/Stream_Text/record_delimiter**	
		1) Carriage-Return Line-Feed 2) carriage-return line-feed	ASCII_Short_String_Collapsed
records	The records attribute provides a count of records.	**1)** **/Product_Observational/File_Area_Observational/Table_Delimited[1]/records** **2)** **/Product_Observational/File_Area_Observational/Table_Delimited[2]/records** **3)** **/Product_Observational/File_Area_Observational/Table_Delimited[3]/records**	

			ASCII_NonNegative_Integer
disp:**red_channel_band**	The red_channel_band attribute identifies the number of the band, along the band axis, that should be loaded, by default, into the red channel of a display device. The first band along the band axis has band number 1.	**1) /Product_Observational/Observation_Area/Discipline_Area/Display_Settings/Color_Display_Settings/red_channel_band**	
			ASCII_Integer
Reference_List	The Reference_List class provides lists general references and cross-references for the product. References cited elsewhere in the label need not be repeated here.	**1) /Product_Observational/Reference_List**	
		1) *internal_reference* 2) *external_reference*	
reference_type	The reference_type attribute provides the name of the association.	**1) /Product_Observational/Observation_Area/Investigation_Area/Internal_Reference/reference_type** **2) /Product_Observational/Observation_Area/Observing_System/Observing_System_Component[1]/Internal_Reference/reference_type** **3) /Product_Observational/Observation_Area/Observing_System/Observing_System_Component[2]/Internal_Reference/reference_type** **4) /Product_Observational/Observation_Area/Target_Identification/Internal_Reference/reference_type** **5) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Data_Correction_Parameters/Data_Correction[3]/Data_Correction_File/Internal_Reference/reference_type** **6) /Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Input_Product_List/Input_Product/Internal_Reference/reference_type** **7) /Product_Observational/Reference_List/Internal_Reference/reference_type**	

		8) /Product_Observational/Reference_List/Source_Product_Internal/reference_type	
			ASCII_Short_String_Collapsed
msn:**release_number**	Release_number is the number of a scheduled release of data from the provider to PDS. The first data release is typically Release 1. The release_number for a given product is always the first release in which it appears, and does not change if the product is revised later.	**1) /Product_Observational/Observation_Area/Mission_Area/Mission_Information/release_number**	
			ASCII_Integer
geom:**rotation_direction**	The rotation_direction attribute identifies the direction of the rotation for a specific quaternion. This is used when the two frames involved are unambiguously identifed in the enclosing classes.	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Coordinate_Space_Definition[1]/Quaternion_Plus_Direction/rotation_direction** **2) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Coordinate_Space_Definition[2]/Quaternion_Plus_Direction/rotation_direction**	
		1) Present to Reference 2) Reference to Present 3) Forward 4) Reverse 5) From Base 6) Toward Base	ASCII_Short_String_Collapsed
img:**sample_bits**	The sample_bits attribute specifies the logical or active number of bits in the data, which is distinct from the physical number of bits (for example, encoding 12-bit data within 16-bit words). These logical bits are stored in the low order (least significant) bits, with unused bits filled with 0 (or 1 for negative integers to preserve a two's complement representation). This is distinct from the valid data range (specified by valid_minimum and valid_maximum in Special_Constants class) because all values, including missing/invalid flag values, must fit within the sample_bits. The intent is that the data should be able to be sent through a communication channel that passes only sample_bits with no loss in fidelity.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Sampling_Parameters/sample_bits**	
			ASCII_Short_String_Collapsed
img:**Sampling_Parameters**	The Sampling_Parameters class contains attributes and classes related to the sampling, scaling, companding, and compression or reduction in resolution of data.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Sampling_Parameters**	

		1) *crosstrack_summing* 2) *downtrack_summing* 3) *sample_bits* 4) *sample_bit_mask* 5) *sampling_factor* 6) *Companding_Parameters*	
Science_Facets	The Science_Facets class contains the science-related search facets. It is optional and may be repeated if an product has facets related to, for example, two different disciplines (as defined by the discipline_name facet). Note that Science_Facets was modeled with Discipline_Facets as a component and Discipline_Facets was modeled with Group_Facet1 and Group_Facet2 as components. This dependency hierarchy was flattened and only Science_Facets exists in the schema.	**1) /Product_Observational/Observation_Area/Primary_Result_Summary /Science_Facets**	
		1) *wavelength_range* 2) *domain* 3) *has_Discipline_Facets*	
sequence_number	The sequence_number attribute provides a number that is used to order axes in an array.	**1) /Product_Observational/File_Area_Observational/Array_3D_Image/Axis_Array[1]/sequence_number** **2) /Product_Observational/File_Area_Observational/Array_3D_Image/Axis_Array[2]/sequence_number** **3) /Product_Observational/File_Area_Observational/Array_3D_Image/Axis_Array[3]/sequence_number**	
			ASCII_NonNegative_Integer
proc:**Software**	The Software class describes the data processing software used in order to produce the data product.	**1) /Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software**	
		1) *name* 2) *software_id* 3) *software_version_id* 4) *software_type* 5) *description* 6) *Internal_Reference* 7) *Software_Program*	

<table>
<tr>
<td>proc:Software_Program</td>
<td>The Software_Program class describes the specific components or tasks of the Software executed in producing the data product.</td>
<td>
1) /Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[1]

2) /Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[2]

3) /Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[3]

4) /Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[4]

5) /Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[5]

6) /Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[6]
<table>
<tr>
<td>1) name
2) program_type_name
3) program_user
4) program_hostname
5) program_path
6) program_version
7) program_start_date_time
8) program_stop_date_time
9) description
10) Software_Program_Parameters</td>
<td></td>
</tr>
</table>
</td>
</tr>
<tr>
<td>proc:Software_Program_Parameters</td>
<td>The Software_Program_Parameters class specifies the set of 1 or more parameters for the software program. These parameters can be input, output, or log information. The premise being a way to capture as much information as possible about the software program execution.</td>
<td>
1) /Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[2]/Software_Program_Parameters

2) /Product_Observational/Observation_Area/Discipline_Area/Processin
</td>
</tr>
</table>

		g_Information/Process/Software/Software_Program[3]/Software_Program_Parameters **3) /Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[4]/Software_Program_Parameters** **4) /Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[5]/Software_Program_Parameters** **5) /Product_Observational/Observation_Area/Discipline_Area/Processing_Information/Process/Software/Software_Program[6]/Software_Program_Parameters**	
		1) *Parameter*	
cart:**Spatial_Reference_Information**	The Spatial_Reference_Information class provides a description of the reference frame for, and the means to encode, coordinates in a data set.	**1) /Product_Observational/Observation_Area/Discipline_Area/Cartography/Spatial_Reference_Information**	
		1) *has_Horizontal_Coordate_System_Definition*	
Special_Constants	The Special Constants class provides a set of values used to indicate special cases that occur in the data.	**1) /Product_Observational/File_Area_Observational/Array_3D_Image/Special_Constants**	
		1) *saturated_constant* 2) *missing_constant* 3) *error_constant* 4) *invalid_constant* 5) *unknown_constant* 6) *not_applicable_constant* 7) *valid_maximum* 8) *high_instrument_saturation* 9) *high_representation_saturation* 10) *valid_minimum* 11) *low_instrument_saturation* 12) *low_representation_saturation*	

geom:**SPICE_Kernel_Files**	The SPICE_Kernel_Files class provides references to the SPICE files used when calculating geometric values.	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/SPICE_Kernel_Files**	
		1) *comment* 2) *SPICE_Kernel_Identification*	
geom:**SPICE_Kernel_Identification**	The SPICE_Kernel_Identification class optionally includes the SPICE kernel type and provides two alternatives for identifying the product: LIDVID using Internal_Reference, and the file name of the kernel file. Although optional, LIDVID should be given if one is available. The optional kernel_provenance attribute indicates whether the kernel is a predict or reconstructed kernel, or some combination of the two, or if it is a kernel type for which such distinctions do not apply.	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/SPICE_Kernel_Files/SPICE_Kernel_Identification**	
		1) *kernel_type* 2) *spice_kernel_file_name* 3) *kernel_provenance* 4) *Internal_Reference*	
cart:**start_azimuth**	The start_azimuth specifies the angular distance from a fixed reference position at which an image or observation starts. Azimuth is measured in a spherical coordinate system, in a plane normal to the principal axis. Azimuth values increase according to the right hand rule relative to the positive direction of the principal axis of the spherical coordinate system. For lander map projections, this attribute specifies the azimuth of the left edge of the output map. Applies to Cylindrical and Cylindrical-Perspective lander map projections only.	**1) /Product_Observational/Observation_Area/Discipline_Area/Cartography/Spatial_Reference_Information/Horizontal_Coordinate_System_Definition/Local/Map_Projection_Lander/Cylindrical/start_azimuth**	
			ASCII_Real *Units_of_Angle*
msn:**start_local_mean_solar_time**	start_local_mean_solar_time is the local mean solar time, as defined in the main PDS4 data dictionary.	**1) /Product_Observational/Observation_Area/Mission_Area/Mission_Information/Surface_Mission_Information/start_local_mean_solar_time**	
			ASCII_Short_String_Collapsed
msn:**start_local_mean_solar_time_sol**	The start_local_mean_solar_time_sol element specifies the number of solar days elapsed since a reference day (e.g. the day on which a landing vehicle set down) for local mean solar time (LMST). Days are measured in rotations of the planet in question from midnight to midnight. The reference day is '0', as Landing day is Sol 0. If before Landing day, then value will be less than or equal to '0'and can be negative.	**1) /Product_Observational/Observation_Area/Mission_Area/Mission_Information/Surface_Mission_Information/start_local_mean_solar_time_sol**	
			ASCII_Integer
msn:**start_local_true_solar_time**	start_local_true_solar_time is the local true solar time, as defined in the main PDS4 data dictionary.	**1) /Product_Observational/Observation_Area/Mission_Area/Mission_Information/Surface_Mission_Information/start_local_true_solar_time**	
			ASCII_Short_String_Collapsed

img_surface:**Stereo_Product_Parameters**	The Stereo_Product_Parameters class describes the conditions under which stereo analysis was performed. This includes items such as the stereo baseline (separation between the cameras) and what partner image(s) were used for stereo analysis. If present, stereo partner images can be referenced using either an Internal_Reference or External_Reference.	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Mission_Parameters/Stereo_Product_Parameters**	
		1) *stereo_baseline_length* 2) *External_Reference*	
cart:**stop_azimuth**	The stop_azimuth attribute pecifies the angular distance from a fixed reference position at which an image or observation stops. Azimuth is measured in a spherical coordinate system, in a plane normal to the principal axis. Azimuth values increase according to the right hand rule relative to the positive direction of the principal axis of the spherical coordinate system. For lander map projections, this attribute specifies the azimuth of the right edge of the output map. Applies to Cylindrical and Cylindrical-Perspective lander map projections only.	**1) /Product_Observational/Observation_Area/Discipline_Area/Cartography/Spatial_Reference_Information/Horizontal_Coordinate_System_Definition/Local/Map_Projection_Lander/Cylindrical/stop_azimuth**	
			ASCII_Real *Units_of_Angle*
Stream_Text	The Stream text class defines a text object.	**1) /Product_Observational/File_Area_Observational_Supplemental[1]/Stream_Text**	
		1) *name* 2) *offset* 3) *record_delimiter* 4) *local_identifier* 5) *object_length* 6) *md5_checksum* 7) *description* 8) *parsing_standard_id* 9) *data_object*	
img:**Subframe_Parameters**	The Subframe_Parameters class describes the position and other optional characteristics of an image subframe, relative to the original image.	**1) /Product_Observational/Observation_Area/Discipline_Area/Imaging/Image_Product_Information/Subframe_Parameters**	
		1) *first_line* 2) *first_sample* 3) *lines* 4) *samples* 5) *name* 6) *description* 7) *subframe_type*	
img_surface:**Surface_Imaging_Parameters**	Attributes specific to imaging instruments on surface missions.	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Imaging_Parameters**	

		1) *Image_Identifiers* 2) *Instrument_Information* 3) *Derived_Product_Parameters* 4) *Error_Model_Information* 5) *Geometry_Projection_Parameters* 6) *Stereo_Product_Parameters* 7) *Error_Pixel*	
msn:**Surface_Mission_Information**	The Surface_Mission_Information class provides information about a surface mission.	**1) /Product_Observational/Observation_Area/Mission_Area/Mission_Information/Surface_Mission_Information**	
		1) *start_sol_number* 2) *stop_sol_number* 3) *start_local_mean_solar_time* 4) *stop_local_mean_solar_time* 5) *start_local_mean_solar_time_sol* 6) *stop_local_mean_solar_time_sol* 7) *start_local_true_solar_time* 8) *stop_local_true_solar_time* 9) *start_local_true_solar_time_sol* 10) *stop_local_true_solar_time_sol* 11) *solar_longitude*	
msn_surface:**Surface_Mission_Parameters**	The Surface_Mission_Parameters class contains attributes specific to surface missions which apply across instrument types.	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Mission_Parameters**	
		1) *surface_gravity* 2) *Command_Execution_Information* 3) *Telemetry_Information*	
cart:**Surface_Model_Parameters**	null	**1) /Product_Observational/Observation_Area/Discipline_Area/Cartography/Spatial_Reference_Information/Horizontal_Coordinate_System_Definition/Local/Surface_Model_Parameters**	
		1) *surface_model_type* 2) *Surface_Model_Planar*	

cart:**Surface_Model_Planar**	null	**1) /Product_Observational/Observation_Area/Discipline_Area/Cartography/Spatial_Reference_Information/Horizontal_Coordinate_System_Definition/Local/Surface_Model_Parameters/Surface_Model_Planar**	
		1) *Vector_Surface_Normal* 2) *Vector_Surface_Ground_Location*	
cart:**surface_model_type**	Specifies the type of surface used for the reprojection performed during the mosaicking process. Valid values: Planar - refers to a flat planar model; Spherical refers to a spherical model where the camera is at the center of the sphere.	**1) /Product_Observational/Observation_Area/Discipline_Area/Cartography/Spatial_Reference_Information/Horizontal_Coordinate_System_Definition/Local/Surface_Model_Parameters/surface_model_type**	
		1) Spherical 2) Planar	ASCII_Short_String_Collapsed
Table_Delimited	The Table_Delimited class defines a simple table (spreadsheet) with delimited fields and records.	**1) /Product_Observational/File_Area_Observational/Table_Delimited[1]** **2) /Product_Observational/File_Area_Observational/Table_Delimited[2]** **3) /Product_Observational/File_Area_Observational/Table_Delimited[3]**	
		1) *name* 2) *offset* 3) *records* 4) *local_identifier* 5) *object_length* 6) *record_delimiter* 7) *md5_checksum* 8) *parsing_standard_id* 9) *description* 10) *field_delimiter* 11) *data_object* 12) *uniformly_sampled* 13) *has_delimited_record*	
Target_Identification	The Target_Identification class provides detailed target identification information.	**1) /Product_Observational/Observation_Area/Target_Identification**	
		1) *name* 2) *alternate_designation* 3) *type* 4) *description*	

		5) *internal_reference*	
msn_surface:**Telemetry_Information**	The Telemetry_Information class contains downlink-related attributes used primarily during mission operations.	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Mission_Parameters/Telemetry_Information**	
		1) *application_id* 2) *application_subtype_id* 3) *application_name* 4) *provider_id* 5) *flight_software_version_id* 6) *telemetry_source_name* 7) *transport_protocol* 8) *communication_session_id* 9) *telemetry_source_start_time* 10) *telemetry_source_sclk_start* 11) *product_completion_status* 12) *earth_received_start_date_time* 13) *earth_received_stop_date_time* 14) *download_priority* 15) *data_size* 16) *expected_packets* 17) *received_packets*	
Time_Coordinates	The Time_Coordinates class provides a list of time coordinates.	**1) /Product_Observational/Observation_Area/Time_Coordinates**	
		1) *start_date_time* 2) *stop_date_time* 3) *local_mean_solar_time* 4) *local_true_solar_time* 5) *solar_longitude*	
title	The name given to the resource. Typically, a Title will be a name by which the resource is formally known. - Dublin Core - The title is used to refer to an object in a version independent manner.	**1) /Product_Observational/Identification_Area/title**	
			UTF8_Short_String_Collapsed
type	The type attribute classifies Investigation_Area according to the scope of the investigation..	**1) /Product_Observational/Observation_Area/Investigation_Area/type** **2) /Product_Observational/Observation_Area/Observing_System/Observing_System_Component[1]/type**	

		3) **/Product_Observational/Observation_Area/Observing_System/Observing_System_Component[2]/type** **4)** **/Product_Observational/Observation_Area/Target_Identification/type**	
		1) Individual Investigation 2) Mission 3) Observing Campaign 4) Other Investigation	ASCII_Short_String_Collapsed
geom:**Vector_Axis**	The Vector_Axis is a unit vector that describes the axis of the camera, defined as the normal to the image plane.	**1)** **/Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Camera_Model_Parameters/CAHVORE_Model/Vector_Axis**	
		1) *x_unit* 2) *y_unit* 3) *z_unit*	
geom:**Vector_Center**	The Vector_Center describes the location of the pinhole of a camera.	**1)** **/Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Camera_Model_Parameters/CAHVORE_Model/Vector_Center**	
		1) *x_position* 2) *y_position* 3) *z_position*	
geom:**Vector_Device_Gravity**	The Vector_Device_Gravity class is a unit vector that specifies the direction of an external force acting on the articulation device, in the spacecraft's coordinate system, at the time the pose was computed.	**1)** **/Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Articulation_Device_Parameters[1]/Vector_Device_Gravity**	
		1) *x_unit* 2) *y_unit* 3) *z_unit*	
geom:**Vector_Horizontal**	The Vector_Horizontal encodes the horizontal axis of the image plane (H'), the coordinate (Hc) of the image column at the optical center of the image plane, and the horizontal focal length (Hs) of the camera, in pixels.	**1)** **/Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Camera_Model_Parameters/CAHVORE_Model/Vector_Horizontal**	
		1) *x_pixel* 2) *y_pixel* 3) *z_pixel*	

geom:**Vector_Model_Transform**	The Vector_Model_Transform class specifies, along with the Quaternion_Model_Transform class, the transform used for the camera model in this image. Camera models created by the calibration process have associated with them a pose, comprised of the position (offset) and orientation (quaternion) of the camera at the time it was calibrated. The model is transformed ("pointed") for a specific image by computing, generally using articulation device kinematics, a final pose for the image. The camera model is then translated and rotated from the calibration to final pose. This class specifies the offset portion of the final pose.	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Camera_Model_Parameters/Vector_Model_Transform**	
		1) *x* 2) *y* 3) *z*	
geom:**Vector_Origin_Offset**	The Vector_Origin_Offset class contains attributes that specify the offset from the reference coordinate system's origin to the origin of the coordinate system. It is the location of the current system's origin as measured in the reference system.	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Coordinate_Space_Definition[1]/Vector_Origin_Offset** **2) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Coordinate_Space_Definition[2]/Vector_Origin_Offset**	
		1) *x_position* 2) *y_position* 3) *z_position*	
cart:**Vector_Projection_Origin**	The Vector_Projection_Origin class specifies the location of the origin of the projection. For Polar and Cylindrical projections, this is the XYZ point from which all the azimuth/elevation rays emanate. For the Cylindrical-Perspective projection, this defines the center of the circle around which the synthetic camera orbits. For Orthographic, Orthorectified, and Vertical projections, this optional keyword specifies the point on the projection plane that serves as the origin of the projection (i.e. all points on a line through this point in the direction of PROJECTION_Z_AXIS_VECTOR will be ocated at X=Y=0 in the projection). If not present, (0,0,0) should be assumed. This translation is generally not necessary and not often used; the (X		
		1) CLASS	cart *x_position,y_position,z_position*
img_surface:**Vector_Range_Origin**	The Vector_Range_Origin class specifies the 3-D space from which the Range values are measured in a Range RDR. This will normally be the same as the C point of the camera. It is expressed in the coordinate system specified by the Coordinate_Space_Reference class.	**1) /Product_Observational/Observation_Area/Mission_Area/Surface_Imaging_Parameters/Derived_Product_Parameters/Vector_Range_Origin**	
		1) *x_position*	

		2) *y_position* 3) *z_position*	
cart:**Vector_Surface_Ground_Location**	The Vector_Surface_Ground_Location class specifies any point on the surface. This point is measured in the coordinates specified by the Coordinate_Space reference in the Map_Projection_Lander class.	**1) /Product_Observational/Observation_Area/Discipline_Area/Cartography/Spatial_Reference_Information/Horizontal_Coordinate_System_Definition/Local/Surface_Model_Parameters/Surface_Model_Planar/Vector_Surface_Ground_Location**	
		1) *x_position* 2) *y_position* 3) *z_position*	
cart:**Vector_Surface_Normal**	The Vector_Surface_Normal class specifies a vector normal to the planar surface. This vector is measured in the coordinates specified by the Coordinate_Space reference in the Map_Projection_Lander class.	**1) /Product_Observational/Observation_Area/Discipline_Area/Cartography/Spatial_Reference_Information/Horizontal_Coordinate_System_Definition/Local/Surface_Model_Parameters/Surface_Model_Planar/Vector_Surface_Normal**	
		1) *x_unit* 2) *y_unit* 3) *z_unit*	
geom:**Vector_Vertical**	The Vector_Vertical encodes the vertical axis of the image plane (V' or Vp), the coordinate (Vc) of the image row(?) at the optical center of the image plane, and the vertical focal length (Vs) of the camera, in pixels.	**1) /Product_Observational/Observation_Area/Discipline_Area/Geometry/Geometry_Lander/Camera_Model_Parameters/CAHVORE_Model/Vector_Vertical**	
		1) *x_pixel* 2) *y_pixel* 3) *z_pixel*	
version_id	The version_id attribute provides the version of the product, expressed in the PDS [m.n] notation.	**1) /Product_Observational/Identification_Area/version_id** **2) /Product_Observational/Identification_Area/Modification_History/Modification_Detail/version_id**	
			ASCII_Short_String_Collapsed
cart:**Vertical**	null	**1) /Product_Observational/Observation_Area/Discipline_Area/Cartography/Spatial_Reference_Information/Horizontal_Coordinate_System_Definition/Local/Map_Projection_Lander/Vertical**	
		1) *pixel_resolution_x* 2) *pixel_resolution_y*	

		3) *x_axis_maximum* 4) *x_axis_minimum* 5) *y_axis_maximum* 6) *y_axis_minimum* 7) *Pixel_Position_Origin* 8) *Vector_Projection_Origin*	
disp:**vertical_display_axis**	The vertical_display_axis attribute identifies, by name, the axis of an Array (or Array subclass) that is intended to be displayed in the vertical or "line" dimension on a display device. The value of this attribute must match the value of one, and only one, axis_name attribute in an Axis_Array class of the associated Array.	**1) /Product_Observational/Observation_Area/Discipline_Area/Display_Settings/Display_Direction/vertical_display_axis**	
			ASCII_Short_String_Collapsed
disp:**vertical_display_direction**	The vertical_display_direction attribute specifies the direction along the screen of a display device that data along the vertical axis of an Array is supposed to be displayed.	**1) /Product_Observational/Observation_Area/Discipline_Area/Display_Settings/Display_Direction/vertical_display_direction**	
		1) Bottom to Top 2) Top to Bottom	ASCII_Short_String_Collapsed
wavelength_range	The wavelength range attribute specifies the wavelength range over which the data were collected or which otherwise characterizes the observation(s). Boundaries are vague, and there is overlap.	**1) /Product_Observational/Observation_Area/Primary_Result_Summary/Science_Facets/wavelength_range**	
		1) Far Infrared 2) Gamma Ray 3) Infrared 4) Microwave 5) Millimeter 6) Near Infrared 7) Radio 8) Submillimeter 9) Ultraviolet 10) Visible 11) X-ray	ASCII_Short_String_Collapsed
cart:**x_axis_maximum**	The x_axis_maximum attribute specifies the value of the X coordinate (measured in the projection frame) of a Vertical, Orthographic or Orthorectified lander map projection at the top of the image. Note that +X is at the top of the image and +Y is at the right, so +X corresponds to North in the Vertical projection.	**1) /Product_Observational/Observation_Area/Discipline_Area/Cartography/Spatial_Reference_Information/Horizontal_Coordinate_System_Definition/Local/Map_Projection_Lander/Orthorectified/x_axis_maximum**	
			ASCII_Real *Units_of_Length*

cart:**x_axis_minimum**	The x_axis_minimum attribute specifies the value of the X coordinate (measured in the projection frame) of a Vertical, Orthographic or Orthorectified lander map projection at the bottom of the image.	**1) /Product_Observational/Observation_Area/Discipline_Area/Cartography/Spatial_Reference_Information/Horizontal_Coordinate_System_Definition/Local/Map_Projection_Lander/Orthorectified/x_axis_minimum**	
			ASCII_Real *Units_of_Length*
cart:**y_axis_maximum**	The y_axis_minimum attribute specifies the value of the Y coordinate (measured in the projection frame) of a Vertical, Orthographic or Orthorectified lander map projection at the right edge of the image.	**1) /Product_Observational/Observation_Area/Discipline_Area/Cartography/Spatial_Reference_Information/Horizontal_Coordinate_System_Definition/Local/Map_Projection_Lander/Orthorectified/y_axis_maximum**	
			ASCII_Real *Units_of_Length*
cart:**y_axis_minimum**	The y_axis_minimum attribute specifies the value of the Y coordinate (measured in the projection frame) of a Vertical, Orthographic or Orthorectified lander map projection at the left edge of the image.	**1) /Product_Observational/Observation_Area/Discipline_Area/Cartography/Spatial_Reference_Information/Horizontal_Coordinate_System_Definition/Local/Map_Projection_Lander/Orthorectified/y_axis_minimum**	
			ASCII_Real *Units_of_Length*
cart:**zero_elevation_line**	The zero_elevation_line attribute specifies the image line representing 0.0 degree elevation. Applies to Cylindrical lander map projections.	**1) /Product_Observational/Observation_Area/Discipline_Area/Cartography/Spatial_Reference_Information/Horizontal_Coordinate_System_Definition/Local/Map_Projection_Lander/Cylindrical/zero_elevation_line**	
			ASCII_Real