

Mars2020 RIMFAX Instrument Product Label Keyword Definitions, Values - PDS Sort

Dictionary:PDS4 Keyword <i>VICAR Property. VICAR Keyword</i>	General Definition <i>Mars 2020-Specific Information</i>	XPath	
		Valid Values (attribute) <i>Children (class)</i>	Data Type <i>Units</i>
mars2020:active_flight_computer	The active_flight_computer indicates which flight computer "string" (separate sets of electronics) was active when a product was acquired. For Mars 2020 there are two redundant flight computers called "strings", also known as Rover Compute Elements (RCEs). Either string, A or B, may be active at any given time.	1)/ Product Observational/Observation Area/Mission Area/Mars2020 Parameters/Observation Information/active_flight_computer	
		1) "A" 2) "B"	ASCII_Short_String_Collapsed
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	
alternate_id <i>IDENTIFICATION. PRODUCT_ID</i>	The alternate_id attribute provides an additional identifier supplied by the data provider. Mars 2020 Specific: <i>For M2020, it is the filename minus the extension.</i>	1)/ Product Observational/Identification Area/Alias List/Alias/alternate_id	
			ASCII_Short_String_Collapsed
msn_surface:application_id <i>TELEMETRY. APPLICATION_PROCESS_ID</i>	The application_id (often abbreviated APID) attribute identifies the process, or source, which created the data. This can include information such as an identification of the instrument which generated the telemetry stream, its operating mode at the time of data acquisition, and any onboard compression of the data. Mars 2020 Specific: <i>For M2020, the Application Process Identifier (APID) identifies the data type encapsulated in the packet, including whether the packet is a data product packet or a non-data product packet. M2020 shall implement the following APID assignments (all numbers below are in decimal, all ranges are inclusive):</i> a) APID 2047 is used for Idle Packets. b) APID 2040-2046 will not be produced by M2020 as these APIDs are reserved by the CCSDS standard. c) APID 0 will not be produced by M2020 . d) APID 1 is reserved for X-band time correlation packets. e) APIDs 2-99 are assigned to non-data product packets. Individual values will be assigned to particular packet types as they are identified. Definitions of these packet formats are defined in this document. Definition of APID assignments is included in the Rover Flight Software APID XML. f) APIDs 100-2039 are assigned to RCE Flight Software data product packets. Definition of APID assignments is included in the Rover Flight Software APID XML. g) APIDs 1500-2039 are reserved for SSE (Simulation and Support Equipment) product types. <i>(Above text from M2020 FGICD Volume 1, Rev A)</i> <i>For M2020, only APID Names uniquely identify Data Product types across all FSW versions. For this reason, the integer APIDs are not documented here.</i> <i>See also APPLICATION_PROCESS_NAME and Appendix A.</i>	1)/ Product Observational/Observation Area/Discipline Area/Surface Mission Information/Telemetry/application_id	
			ASCII_NonNegative_Integer
msn_surface:application_name <i>TELEMETRY. APPLICATION_PROCESS_NAME</i>	The application_name attribute provides the name associated with the source or process which created the data. Mars 2020 Specific: <i>For M2020, only APID Names uniquely identify Data Product types across all FSW versions.</i> <i>See also APPLICATION_PROCESS_ID and Appendix A.</i>	1)/ Product Observational/Observation Area/Discipline Area/Surface Mission Information/Telemetry/application_name	
			ASCII_Short_String_Collapsed

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.	<p>1)/Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Articulation Device Parameters[*]</p> <p>1) local_identifier 2) geom:device_id 3) geom:device_name 4) geom:device_mode 5) geom:device_phase 6) geom:selected_instrument_id 7) geom:Device_Angle 8) geom:Device_Component_State 9) geom:Device_Motor_Counts 10) geom:Device_Pose 11) geom:Vector_Device_Gravity 12) geom:Vector_Device_Gravity_Magnitude 13) geom:Device_Temperature 14) geom:Coordinate_Space_Present 15) geom:Coordinate_Space_Reference 16) geom:Commanded_Geometry</p>
geom:attitude_propagation_counter	Count in clock units of how long it has been since the last IMU reset, which relates to how good the attitude measurement is due to IMU drift.	<p>1)/Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition[1]/Coordinate Space Quality/attitude_propagation_counter</p> <p>ASCII_Real</p>
author_list	The author_list attribute contains a semi-colon-separated list of names of people to be cited as authors of the associated product. The general format for individual names is: SURNAME, GIVEN NAME(s). Initials may be used in lieu of given name(s). If the name contains a suffix ("Jr.", "Sr.", "III", etc.) it should be placed before the comma (.). Do not include the word "and" before the final author. All authors should be listed explicitly - do not elide the list using "et al.".	<p>1)/Product Document/Identification Area/Citation Information/author_list</p> <p>2)/Product Bundle/Identification Area/Citation Information/author_list</p> <p>3)/Product Collection/Identification Area/Citation Information/author_list</p> <p>UTF8_Text_Preserved</p>
msn_surface:auto_delete_flag TELEMETRY. AUTO_DELETE_FLAG	Indicates if the product was to be automatically deleted onboard after it is transmitted.	<p>1)/Product Observational/Observation Area/Discipline Area/Surface Mission Information/Telemetry/auto_delete_flag</p> <p>ASCII_Boolean</p>
msn_surface:boot_counter TELEMETRY. BOOT_COUNT	Counter indicating the number of times the spacecraft flight software has been booted. The intent is that this is a global counter that can uniquely identify the current FSW boot, so other counters that reset at boot time can be disambiguated.	<p>1)/Product Observational/Observation Area/Discipline Area/Surface Mission Information/Command Execution/boot_counter</p> <p>ASCII_Short_String_Collapsed</p>
Bundle	The Bundle class describes a collection of collections.	<p>1)/Product Bundle/Bundle</p> <p>1) bundle_type 2) description 3) Conceptual_Object</p>
Bundle_Member_Entry	The Bundle Member Entry class provides a member reference to a collection.	<p>1)/Product Bundle/Bundle Member Entry[*]</p> <p>1) lid_reference 2) lidvid_reference 3) member_status 4) reference_type</p>
bundle_type	The bundle_type attribute provides a classification for the bundle.	<p>1)/Product Bundle/Bundle/bundle_type</p> <p>1) "Archive" 2) "Supplemental"</p> <p>ASCII_Short_String_Collapsed</p>
mars2020:calibration IDENTIFICATION. RFAX_CALIBRATION	True if the radar is connected to the calibration cable, false if it is connected to the antenna cable.	<p>1)/Product Observational/Observation Area/Mission Area/Mars2020 Parameters/RIMFAX Parameters/calibration</p> <p>ASCII_Boolean</p>
Citation_Information	The Citation_Information class provides specific fields often used in citing the product in journal articles, abstract services, and other reference contexts.	<p>1)/Product Document/Identification Area/Citation Information</p> <p>2)/Product Bundle/Identification Area/Citation Information</p> <p>3)/Product Collection/Identification Area/Citation Information</p> <p>1) author_list 2) editor_list 3) publication_year 4) doi 5) keyword 6) description</p>
Collection	The Collection class provides a description of a set of	<p>1)/Product Collection/Collection</p>

	products.	1) collection_type 2) description	
collection_type	The collection_type attribute provides a classification for the collection.	1) Product Collection/Collection/collection_type 1) "Browse" 2) "Calibration" 3) "Context" 4) "Data" 5) "Document" 6) "Geometry" 7) "Miscellaneous" 8) "SPICE Kernel" 9) "XML Schema"	ASCII_Short_String_Collapsed
msn_surface:command_dispatch_sclk TELEMETRY. COMMAND_DISPATCH_SCLK	Specifies the spacecraft clock time at which the command execution was started. Mars 2020 Specific: <i>The subseconds for this SCLK are expressed not in milliseconds but rather in counts, where each count is 1/65536 of a second. This is indicated in the PDS4 label (but not the VICAR/ODL label) by a "." rather than a "," separating the integer and subsecond components of the SCLK.</i>	1) Product Observational/Observation Area/Discipline Area/Surface Mission Information/Command Execution/command_dispatch_sclk	ASCII_Short_String_Collapsed
msn_surface:Command_Execution	The Command_Execution class contains information about how the command that acquired this data was executed, such as sequence or activity.	1) Product Observational/Observation Area/Discipline Area/Surface Mission Information/Command Execution 1) msn_surface:sequence_id 2) msn_surface:sequence_version_id 3) msn_surface:sequence_execution_count 4) msn_surface:command_sequence_number 5) msn_surface:command_source_id 6) msn_surface:command_dispatch_sclk 7) msn_surface:observation_id 8) msn_surface:request_id 9) msn_surface:boot_counter 10) msn_surface:rtt_version	
msn_surface:command_sequence_number IDENTIFICATION. COMMAND_SEQUENCE_NUMBER	The command_sequence_number attribute provides a numeric identifier for a sequence of commands sent to a spacecraft or instrument. Mars 2020 Specific: <i>For M2020, this is the command number which identifies the specific generating command within the specified sequence.</i>	1) Product Observational/Observation Area/Discipline Area/Surface Mission Information/Command Execution/command_sequence_number	ASCII_NonNegative_Integer
comment	The comment attribute is a character string expressing one or more remarks or thoughts relevant to the object.	1) Product Collection/Context Area/comment 2) Product Collection/Context Area/Investigation Area/Internal Reference/comment 3) Product Collection/Context Area/Observing System/Observing System Component[*]/Internal Reference/comment 4) Product Collection/Context Area/Target Identification/Internal Reference/comment 5) Product Bundle/Context Area/Target Identification/Internal Reference/comment 6) Product Observational/Reference List/Source Product Internal/comment 7) Product Observational/Identification Area/Alias List/Alias/comment 8) Product Observational/Observation Area/Investigation Area/Internal Reference/comment 9) Product Observational/Observation Area/Observing System/Observing System Component[*]/Internal Reference/comment 10) Product Observational/Observation Area/Target Identification/Internal Reference/comment	ASCII_Text_Preserved
msn_surface:communication_session_id TELEMETRY. COMMUNICATION_SESSION_ID	Identifies the communication session used to acquire this data. Mars 2020 Specific: <i>For M2020, this is the active communication session ID at the time of MPDU (Metadata Protocol Data Unit) creation. The MPDU is the first PDU (Protocol Data Unit) produced for a data product, and contains general and M2020 specific metadata. It is wholly contained in a single packet. A value of 0 means the</i>	1) Product Observational/Observation Area/Discipline Area/Surface Mission Information/Telemetry/communication_session_id	

	<i>value is not set.</i>		ASCII_Short_String_Collapsed
mars2020:config_id <i>IDENTIFICATION. RFX_CONFIG_ID</i>	Identifier of current RIMFAX configuration mode	1)/ Product Observational/Observation Area/Mission Area/Mars2020 Parameters/RIMFAX Parameters/config_id	ASCII_Integer
Context_Area	The Context Area provides context information for a product.	1)/ Product Document/Context Area 2)/ Product Bundle/Context Area 3)/ Product Collection/Context Area	
		1) comment 2) Time Coordinates 3) Primary Result Summary 4) Investigation Area 5) Observing System 6) Target Identification 7) Mission Area 8) Discipline Area	
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 2)/ Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition[*]	
		1) local identifier 2) geom:positive azimuth direction 3) geom:positive elevation direction 4) geom:quaternion measurement method 5) geom:Coordinate Space Present 6) geom:Vector Origin Offset 7) geom:Quaternion Plus Direction 8) geom:Coordinate Space Reference 9) geom:Coordinate Space Quality	
geom:coordinate_space_frame_type *. <i>COORDINATE_SYSTEM_NAME</i>	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/Coordinate Space Present/Coordinate Space Indexed/coordinate space frame type 2)/ Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition/Coordinate Space Reference/Coordinate Space Indexed/coordinate space frame type 3)/ Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition[*]/Coordinate Space Present/Coordinate Space Indexed/coordinate space frame type 4)/ Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition[*]/Coordinate Space Reference/Coordinate Space Indexed/coordinate space frame type	

		<ol style="list-style-type: none"> 1) "SITE_FRAME" 2) "ROVER_NAV_FRAME" 3) "ROVER_MECH_FRAME" 4) "LOCAL_LEVEL_FRAME" 5) "RSM_HEAD_FRAME" 6) "ARM_TURRET_FRAME" 7) "ARM_DRILL_FRAME" 8) "ARM_DOCKING_POST_FRAME" 9) "ARM_PIXL_FRAME" 10) "ARM_GDRT_FRAME" 11) "ARM_FCS_FRAME" 12) "ARM_WATSON_FRAME" 13) "ARM_SHERLOC_FRAME" 14) "ARM_CUSTOM_TCP_FRAME" 15) "PIXL_BASE_FRAME" 16) "PIXL_SENSOR_FRAME" 17) "HELL_G_FRAME" 18) "HELL_M_FRAME" 19) "HELL_S1_FRAME" 20) "HELL_S2_FRAME" 21) "CINT_FRAME" 22) "MCMF_FRAME" 23) "MCZ_CAL_PRIMARY" 24) "DRILL_BIT_TIP" 25) "MEDA_RDS" 	ASCII_Short_String_Collapsed
<p>geom:Coordinate_Space_Index</p> <p>*. REFERENCE_COORD_SYSTEM_INDEX</p>	Identifies a coordinate space using an index value given in an identified list.	<ol style="list-style-type: none"> 1)/Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition/Coordinate Space Reference/Coordinate Space Indexed/Coordinate Space Index 2)/Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition[*]/Coordinate Space Present/Coordinate Space Indexed/Coordinate Space Index[*] 3)/Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition[*]/Coordinate Space Reference/Coordinate Space Indexed/Coordinate Space Index[*] 	
		<ol style="list-style-type: none"> 1) geom:List_Index_No_Units 2) geom:index_sequence_number 3) geom:index_name 4) geom:index_id 5) geom:index_value_number 	
geom:Coordinate_Space_Indexed	The Coordinate_Space_Indexed class contains the attributes and classes identifying the indexed coordinate space.	<ol style="list-style-type: none"> 1)/Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition/Coordinate Space Present/Coordinate Space Indexed 2)/Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition/Coordinate Space Reference/Coordinate Space Indexed 3)/Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition[*]/Coordinate Space Present/Coordinate Space Indexed 4)/Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition[*]/Coordinate Space Reference/Coordinate Space Indexed 	
		<ol style="list-style-type: none"> 1) geom:coordinate_space_frame_type 2) geom:solution_id 3) geom:Coordinate_Space_Index 	
geom:Coordinate_Space_Present	The Coordinate_Space_Present class includes the attributes that identifies the coordinate space presently being defined.	<ol style="list-style-type: none"> 1)/Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition/Coordinate Space Present 2)/Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition[*]/Coordinate Space Present 	
		<ol style="list-style-type: none"> 1) geom:Coordinate_Space_Identification 2) geom:Coordinate_Space_Indexed 3) geom:Coordinate_Space_SPICE 4) Local_Internal_Reference 	
geom:Coordinate_Space_Quality	Parameters that indicate the quality of the coordinate space knowledge.	<ol style="list-style-type: none"> 1)/Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition/Coordinate Space Quality 2)/Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition[*]/Coordinate Space Quality 	
		<ol style="list-style-type: none"> 1) geom:quaternion_measurement_method 2) geom:attitude_propagation_counter 3) geom:attitude_propagation_duration 	

<p>geom:Coordinate_Space_Reference</p>	<p>The <code>Coordinate_Space_Reference</code> class includes the attributes that identify the coordinate space being used to express coordinates in the class in which it appears.</p>	<p>1)Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition/Coordinate Space Reference</p> <p>2)Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition[*]/Coordinate Space Reference</p> <p>1) geom:Coordinate_Space_Identification 2) geom:Coordinate_Space_Indexed 3) geom:Coordinate_Space_SPICE 4) Local Internal Reference</p>
<p>copyright</p>	<p>The copyright attribute is a character string giving information about the exclusive right to make copies, license, and otherwise exploit an object, whether physical or digital.</p>	<p>1)Product Document/Document/copyright</p> <p>ASCII_Text_Preserved</p>
<p>creation_date_time</p> <p>IDENTIFICATION. PRODUCT_CREATION_TIME</p>	<p>The <code>creation_date_time</code> attribute provides a date and time when the object was created.</p>	<p>1)Product Observational/File Area Observational/File/creation_date_time</p> <p>ASCII_Date_Time_YMD</p>
<p>msn_surface:data_size</p> <p>TELEMETRY. IMAGE_DATA_SIZE</p>	<p>The <code>data_size</code> specifies number of bytes in the compressed data stream, not including headers.</p> <p>Mars 2020 Specific: <i>For Mastcam-Z, Watson, and ACI, specifies the size of the image data product on the camera DEA.</i></p> <p><i>For SkyCam, reports the size of the telemetered image data in bytes, i.e. the sum of the Image Data fields of all the segments of the image.</i></p>	<p>1)Product Observational/Observation Area/Discipline Area/Surface Mission Information/Telemetry/data_size</p> <p>ASCII_NonNegative_Integer</p>
<p>data_type</p>	<p>The <code>data_type</code> attribute provides the hardware representation used to store a value in <code>Field_Delimited</code> (see PDS Standards Reference section "Character Data Types").</p>	<p>1)Product Observational/File Area Observational/Table Binary/Record Binary/Group Field Binary/Field Binary/data_type</p> <p>2)Product Collection/File Area Inventory/Inventory/Record Delimited/Field Delimited[*]/data_type</p> <p>3)Product Observational/File Area Observational/Table Delimited/Record Delimited/Field Delimited[*]/data_type</p> <p>1) "ASCII_AnyURI" 2) "ASCII_BibCode" 3) "ASCII_Boolean" 4) "ASCII_DOI" 5) "ASCII_Date_DOY" 6) "ASCII_Date_Time_DOY" 7) "ASCII_Date_Time_DOY_UTC" 8) "ASCII_Date_Time_YMD" 9) "ASCII_Date_Time_YMD_UTC" 10) "ASCII_Date_YMD" 11) "ASCII_Directory_Path_Name" 12) "ASCII_File_Name" 13) "ASCII_File_Specification_Name" 14) "ASCII_Integer" 15) "ASCII_LID" 16) "ASCII_LIDVID" 17) "ASCII_LIDVID_LID" 18) "ASCII_MD5_Checksum" 19) "ASCII_NonNegative_Integer" 20) "ASCII_Numeric_Base16" 21) "ASCII_Numeric_Base2" 22) "ASCII_Numeric_Base8" 23) "ASCII_Real" 24) "ASCII_String" 25) "ASCII_Time" 26) "ASCII_VID" 27) "UTF8_String"</p> <p>ASCII_Short_String_Collapsed</p>
<p>mars2020:decimation</p> <p>IDENTIFICATION. RFAX_DECIMATION</p>	<p>Onboard decimation of acquired soundings, in number of soundings removed per each sounding downlinked.</p>	<p>1)Product Observational/Observation Area/Mission Area/Mars2020_Parameters/RIMFAX_Parameters/decimation</p> <p>ASCII_Integer</p>

description	The description attribute provides a statement, picture in words, or account that describes or is otherwise relevant to the object.	1)/ Product Document/Identification Area/Citation Information/description 2)/ Product Bundle/Identification Area/Citation Information/description 3)/ Product Bundle/Identification Area/Modification History/Modification Detail/description 4)/ Product Bundle/Bundle/description 5)/ Product Observational/File Area Observational/Table Binary/Record Binary/Group Field Binary/description 6)/ Product Observational/File Area Observational/Table Binary/Record Binary/Group Field Binary/Field Binary/description 7)/ Product Collection/Identification Area/Citation Information/description 8)/ Product Collection/Identification Area/Modification History/Modification Detail/description 9)/ Product Collection/File Area Inventory/Inventory/Record Delimited/Field Delimited[*]/description 10)/ Product Observational/Identification Area/Modification History/Modification Detail/description 11)/ Product Observational/File Area Observational/Table Delimited/description 12)/ Product Observational/File Area Observational/Table Delimited/Record Delimited/Field Delimited[*]/description
geom:Device_Angle <i>OBSERVATION_REQUEST_PARMS. INSTRUMENT_COORDINATE OBSERVATION_REQUEST_PARMS. INSTRUMENT_COORDINATE_NAME</i>	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[*]/Device_Angle 1) <i>local_identifier</i> 2) <i>geom:Device_Angle_Index</i>
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[*]/Device_Angle/Device_Angle_Index[*] 1) <i>geom:List_Index_Angle</i> 2) <i>geom:index_value_angle</i> 3) <i>geom:index_sequence_number</i> 4) <i>geom:index_name</i> 5) <i>geom:index_id</i>
geom:Device_Component_State	The Device_Component_State class is a container for the states of the various components of the articulation device.	1)/ Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Articulation Device Parameters[2]/Device_Component_State 1) <i>local_identifier</i> 2) <i>geom:Device_Component_State_Index</i>
geom:Device_Component_State_Index	The Device_Component_State_Index class is a container for one state of a component of the articulation device.	1)/ Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Articulation Device Parameters[*]/Device_Component_State/Device_Component_State_Index[*] 1) <i>geom:List_Index_Text</i> 2) <i>geom:index_sequence_number</i> 3) <i>geom:index_name</i> 4) <i>geom:index_id</i> 5) <i>geom:index_value_string</i>
geom:device_id * <i>ARTICULATION_STATE. ARTICULATION_DEVICE_ID</i>	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[*]/device_id 1) "CHASSIS" 2) "HGA" 3) "RSM" 4) "ARM" 5) "SHA" 6) "SCS" 7) "DRILL" ASCII_Short_String_Collapsed
geom:device_mode <i>CHASSIS_ARTICULATION_STATE. ARTICULATION_DEVICE_MODE DRILL_ARTICULATION_STATE. ARTICULATION_DEVICE_MODE</i>	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.	1)/ Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Articulation Device Parameters[*]/device_mode

<p>GRAPPLE_ARTICULATION_STATE. ARTICULATION_DEVICE_MODE HGA_ARTICULATION_STATE. ARTICULATION_DEVICE_MODE RSM_ARTICULATION_STATE. ARTICULATION_DEVICE_MODE SCS_ARTICULATION_STATE. ARTICULATION_DEVICE_MODE</p>	<p>Mars 2020 Specific: <i>The SCS tube states are defined as followed:</i> a) "EMPTY" - tube has not been used to collect a sample. b) "FILLED" - tube has been used to collect a sample (regardless of volume). c) "SEAL DISPENSED" - seal has been inserted into the tube, but not sealed. d) "SEAL ACTIVATED" - tube is sealed.</p>	<p>1) "EMPTY" 2) "FILLED" 3) "SEAL DISPENSED" 4) "SEAL ACTIVATED"</p>	<p>ASCII_Short_String_Collapsed</p>
<p>geom:device_name</p> <p>* ARTICULATION_STATE. ARTICULATION_DEVICE_NAME ARM_ARTICULATION_STATE. ARTICULATION_DEVICE_NAME</p>	<p>The device_name attribute specifies the common name of an articulation device.</p>	<p>1)/Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Articulation Device Parameters[*]/device_name</p> <p>1) "MOBILITY CHASSIS" 2) "HIGH GAIN ANTENNA" 3) "REMOTE SENSING MAST" 4) "SAMPLE ARM" 5) "SAMPLE HANDLING ARM" 6) "SAMPLE CACHE SYSTEM" 7) "DRILL"</p>	<p>ASCII_Short_String_Collapsed</p>
<p>geom:Device_Temperature</p>	<p>The Device_Temperature class is a container for all available device temperatures of an articulated device and/or part(s) of a device.</p>	<p>1)/Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Articulation Device Parameters[2]/Device Temperature</p> <p>1) local_identifier 2) geom:Device_Temperature_Index</p>	
<p>geom:Device_Temperature_Index</p>	<p>The Device_Temperature_Index class specifies the attributes describing the temperature of one device or some part of a device.</p>	<p>1)/Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Articulation Device Parameters[*]/Device Temperature/Device Temperature Index[*]</p> <p>1) geom:List_Index_Temperature 2) geom:index_sequence_number 3) geom:index_name 4) geom:index_id 5) geom:index_value_temperature 6) geom:index_value_number</p>	
<p>Discipline_Area</p>	<p>The Discipline area allows the insertion of discipline specific metadata.</p>	<p>1)/Product Observational/Observation Area/Discipline Area</p> <p>1) Geometry 2) Surface_Mission_Information 3) Processing_Information</p>	
<p>Document</p>	<p>The Document class describes a document.</p>	<p>1)/Product Document/Document</p> <p>1) revision_id 2) document_name 3) doi 4) author_list 5) editor_list 6) acknowledgement_text 7) copyright 8) publication_date 9) document_editions 10) description 11) Document_Edition 12) Digital_Object</p>	
<p>Document_Edition</p>	<p>A Document Edition is one complete version of the document in a set of files that is distinguished by language, a unique assemblage of file formats, or some other criteria.</p>	<p>1)/Product Document/Document/Document Edition</p> <p>1) edition_name 2) starting_point_identifier 3) language 4) files 5) description 6) Document_File</p>	
<p>Document_File</p>	<p>The Document File class describes a file which is a part of a document.</p>	<p>1)/Product Document/Document/Document Edition/Document File</p>	

		<ol style="list-style-type: none"> 1) File 2) directory_path_name 3) file_name 4) document_standard_id 5) local_identifier 6) creation_date_time 7) file_size 8) records 9) md5_checksum 10) comment 11) Digital_Object 	
document_standard_id	The document_standard_id attribute provides the formal name of a standard used for the structure of a document file.	<ol style="list-style-type: none"> 1) Product Document/Document/Document Edition/Document File/document_standard_id 1) "7-Bit ASCII Text" 2) "Encapsulated Postscript" 3) "GIF" 4) "HTML" 5) "HTML 2.0" 6) "HTML 3.2" 7) "HTML 4.0" 8) "HTML 4.01" 9) "JPEG" 10) "LaTeX" 11) "MPEG-4" 12) "Microsoft Excel" 13) "Microsoft Word" 14) "PDF" 15) "PDF/A" 16) "PNG" 17) "Postscript" 18) "Rich Text" 19) "TIFF" 20) "UTF-8 Text" 	ASCII_Short_String_Collapsed
doi	The doi attribute provides the Digital Object Identifier for an object, assigned by the appropriate DOI System Registration Agency.	<ol style="list-style-type: none"> 1) Product Bundle/Identification Area/Citation Information/doi 2) Product Bundle/Reference List/External Reference[*]/doi 	ASCII_DOI
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.	<ol style="list-style-type: none"> 1) Product Bundle/Context Area/Primary Result Summary/Science Facets/domain 2) Product Collection/Context Area/Primary Result Summary/Science Facets/domain 1) "Atmosphere" 2) "Dynamics" 3) "Heliosheath" 4) "Heliosphere" 5) "Interior" 6) "Interstellar" 7) "Ionosphere" 8) "Magnetosphere" 9) "Rings" 10) "Surface" 	ASCII_Short_String_Collapsed
msn_surface: download_priority <i>TELEMETRY. DOWNLOAD_PRIORITY</i>	The download_priority attribute specifies which data to downlink/transmit, based on order of importance. The ranking and meaning of specific values will vary depending on the mission, and should be defined in the mission software interface specification (SIS). Mars 2020 Specific: <i>Lower numerical values have the higher priority. For example, a product with a priority of 25 will be transmitted before one with a priority of 50. Values are 0-101 for M2020.</i>	<ol style="list-style-type: none"> 1) Product Observational/Observation Area/Discipline Area/Surface Mission Information/Telemetry/download_priority 	ASCII_NonNegative_Integer
msn_surface: earth_received_start_date_time <i>TELEMETRY. EARTH_RECEIVED_START_TIME</i>	The earth_received_start_date_time attribute provides the earliest time at which any component telemetry data for a particular product was received.	<ol style="list-style-type: none"> 1) Product Observational/Observation Area/Discipline Area/Surface Mission Information/Telemetry/earth_received_start_date_time 	ASCII_Date_Time_YMD_UTC
msn_surface: earth_received_stop_date_time <i>TELEMETRY. EARTH_RECEIVED_STOP_TIME</i>	The earth_received_stop_date_time attribute provides the latest time at which any component telemetry data for a particular product was received.	<ol style="list-style-type: none"> 1) Product Observational/Observation Area/Discipline Area/Surface Mission Information/Telemetry/earth_received_stop_date_time 	ASCII_Date_Time_YMD_UTC
edition_name	The edition name attribute provides a name by which the	<ol style="list-style-type: none"> 1) Product Document/Document/Document Edition/edition_name 	

	edition is known.		UTF8_Short_String_Collapsed
editor_list	The editor_list attribute contains a semi-colon-separated list of names of people to be cited as editors of the associated product. The general format for individual names is: SURNAME, GIVEN NAME(s). Initials may be used in lieu of given name(s). If the name contains a suffix ("Jr.", "Sr.", "III", etc.) it should be placed before the comma (,). Do not include the word "and" before the final editor. All editors should be listed explicitly - do not elide the list using "et al."	1)/ Product Bundle/Identification Area/Citation Information/editor_list 2)/ Product Collection/Identification Area/Citation Information/editor_list	UTF8_Text_Preserved
msn_surface: expected_packets <i>TELEMETRY. EXPECTED_PACKETS</i>	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. Mars 2020 Specific: <i>For M2020, telemetry data processing does not track "packets", but instead data product "parts"</i>	1)/ Product Observational/Observation Area/Discipline Area/Surface Mission Information/Telemetry/expected_packets	ASCII_NonNegative_Integer
msn_surface: expected_transmission_path <i>TELEMETRY. EXPECTED_TRANSMISSION_PATH</i>	Specifies the planned transmission path (route) for the telemetry data. See also transmission_path and communication_session_id.	1)/ Product Observational/Observation Area/Discipline Area/Surface Mission Information/Telemetry/expected_transmission_path	ASCII_Short_String_Collapsed
External_Reference	The External_Reference class is used to reference a source outside the PDS registry system.	1)/ Product Bundle/Reference List/External Reference[*] 1) doi 2) reference_text 3) description	
Field_Binary	The Field_Binary class defines a field of a binary record or a field of a binary group.	1)/ Product Observational/File Area Observational/Table Binary/Record Binary/Group Field Binary/Field Binary 1) name 2) field_number 3) field_location 4) data_type 5) field_length 6) field_format 7) unit 8) scaling_factor 9) value_offset 10) description 11) Special_Constants 12) Field_Statistics 13) Packed_Data_Fields	
Field_Delimited	The Field_Delimited class defines a field of a delimited record or a field of a delimited group.	1)/ Product Collection/File Area Inventory/Inventory/Record Delimited/Field Delimited[*] 2)/ Product Observational/File Area Observational/Table Delimited/Record Delimited/Field Delimited[*] 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) Special_Constants 11) Field_Statistics	
field_delimiter	The field_delimiter attribute provides the character that marks the boundary between two fields in a delimited table.	1)/ Product Collection/File Area Inventory/Inventory/field_delimiter 2)/ Product Observational/File Area Observational/Table Delimited/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
field_length	The field_length attribute provides the number of bytes in the field.	1)/ Product Observational/File Area Observational/Table Binary/Record Binary/Group Field Binary/Field Binary/field_length	

			ASCII_NonNegative_Integer <i>Units_of_Storage</i>
field_location	The field_location attribute provides the starting byte for a field within a record or group, counting from '1'.	1)/ Product Observational/File Area Observational/Table Binary/Record Binary/Group Field Binary/Field Binary/field_location	
			ASCII_NonNegative_Integer <i>Units_of_Storage</i>
field_number	The field_number attribute provides the position of a field, within a series of fields, counting from 1. If two fields within a record are physically separated by one or more groups, they have consecutive field numbers; the fields within the intervening group(s) are numbered separately. Fields within a group separated by one or more (sub)groups, will also have consecutive field numbers.	1)/ Product Observational/File Area Observational/Table Binary/Record Binary/Group Field Binary/Field Binary/field_number 2)/ Product Collection/File Area Inventory/Inventory/Record Delimited/Field Delimited[*]/field_number 3)/ Product Observational/File Area Observational/Table Delimited/Record Delimited/Field Delimited[*]/field_number	
			ASCII_NonNegative_Integer
fields	The fields attribute provides a count of the total number of scalar fields directly associated with a table record. Fields within groups within the record are not included in this count.	1)/ Product Observational/File Area Observational/Table Binary/Record Binary/fields 2)/ Product Observational/File Area Observational/Table Binary/Record Binary/Group Field Binary/fields 3)/ Product Collection/File Area Inventory/Inventory/Record Delimited/fields 4)/ Product Observational/File Area Observational/Table Delimited/Record Delimited/fields	
			ASCII_NonNegative_Integer
File	The File class consists of attributes that describe a file in a data store.	1)/ Product Collection/File Area Inventory/File 2)/ 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) Digital_Object	
File_Area_Inventory	The File Area Inventory class describes a file and an inventory consisting of references to members.	1)/ Product Collection/File Area Inventory	
		1) File_Area 2) File 3) Inventory	
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) File_Area 2) File 3) Composite_Structure 4) Array 5) Array_1D 6) Array_2D 7) Array_2D_Image 8) Array_2D_Map 9) Array_2D_Spectrum 10) Array_3D 11) Array_3D_Image 12) Array_3D_Movie 13) Array_3D_Spectrum 14) Encoded_Header 15) Header 16) Stream_Text 17) Table_Binary 18) Table_Character 19) Table_Delimited	
file_name <i>IDENTIFICATION. PRODUCT_ID</i>	The file_name attribute provides the name of a file.	1)/ Product Document/Document/Document Edition/Document File/file_name 2)/ Product Collection/File Area Inventory/File/file_name 3)/ Product Observational/File Area Observational/File/file_name	

			ASCII_Short_String_Collapsed
files	The files attribute provides the number of files in the edition.	1)/ Product Document/Document/Document_Edition/files	ASCII_NonNegative_Integer
msn_surface:flight_software_mode <i>TELEMETRY. FLIGHT_SOFTWARE_MODE</i>	Specifies the active flight software mode at the time of data product creation. Interpretation of specific modes is mission-dependent.	1)/ Product Observational/Observation Area/Discipline Area/Surface Mission Information/Telemetry/flight_software_mode 1) "UNKNOWN" 2) "TEST" 3) "PRELAUNCH" 4) "LAUNCH" 5) "ECLIPSE" 6) "CRUISE" 7) "EDL_APPROACH" 8) "EDL_MAIN" 9) "SURFACE_NOMINAL" 10) "SURFACE_STANDBY" 11) "NONPRIME_TEST" 12) "NONPRIME_PRELAUNCH" 13) "NONPRIME_LAUNCH" 14) "NONPRIME_ECLIPSE" 15) "NONPRIME_CRUISE" 16) "NONPRIME_EDL_APPROACH" 17) "NONPRIME_EDL_MAIN" 18) "NONPRIME_SURFACE_NOMINAL" 19) "NONPRIME_SURFACE_STANDBY"	ASCII_Short_String_Collapsed
msn_surface:flight_software_version_id <i>TELEMETRY. FLIGHT_SOFTWARE_VERSION_ID</i>	The flight_software_version_id attribute identifies the version of the instrument flight software used to acquire the image. Mars 2020 Specific: <i>The version is defined as the time of the FSW build, in seconds since 12:00:00, Jan. 1, 2000.</i>	1)/ Product Observational/Observation Area/Discipline Area/Surface Mission Information/Telemetry/flight_software_version_id	ASCII_Short_String_Collapsed
mars2020:gate_frequency <i>IDENTIFICATION. RFAX_GATE_FREQUENCY</i>	Frequency of the gate signal	1)/ Product Observational/Observation Area/Mission Area/Mars2020 Parameters/RIMFAX Parameters/gate_frequency	ASCII_Real <i>Units_of_Frequency</i>
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) geom:SPICE_Kernel_Files 2) geom:Expanded_Geometry 3) geom:Image_Display_Geometry 4) geom:Geometry_Orbiter 5) geom: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) geom:geometry_state 2) description 3) local_identifier 4) geom:Articulation_Device_Parameters 5) geom:Camera_Model_Parameters 6) geom:Coordinate_Space_Definition 7) geom:Derived_Geometry 8) geom:Motion_Counter	
geom:geometry_state	Specifies the state or configuration of this instance of Geometry_Lander applies. Use of this attribute enables multiple instances of Geometry_Lander, describing the geometry under different conditions. Note that it is legal for more than one instance to have the same geometry_state, in which case the local_identifier should be used to differentiate the instances, along with description. If not present, the semantics of "Telemetry" should be assumed. It is not required that instances be retained; a derived product may have an Adjusted instance but remove the Telemetry one, for example.	1)/ Product Observational/Observation Area/Discipline Area/Geometry/Geometry_Lander/geometry_state	ASCII_Short_String_Collapsed
Group_Field_Binary	The Group_Field_Binary class allows a group of table fields.	1)/ Product Observational/File Area Observational/Table Binary/Record Binary/Group Field Binary	

		<ul style="list-style-type: none"> 1) name 2) group_number 3) group_location 4) repetitions 5) group_length 6) fields 7) groups 8) description 9) Field_Binary 10) Group_Field_Binary 	
group_length	The group_length attribute provides the total length, in bytes, of a repeating field and/or group structure. It is the number of bytes in the repeating fields/groups plus any embedded unused bytes that are also repeated multiplied by the number of repetitions.	<ul style="list-style-type: none"> 1)/Product Observational/File Area Observational/Table Binary/Record Binary/Group Field Binary/group length 	<p>ASCII_NonNegative_Integer</p> <p><i>Units_of_Storage</i></p>
group_location	The group_location attribute provides the starting position for a Group_Field_Binary within the containing Record_Binary or Group_Field_Binary class, in bytes. Location '1' denotes the first byte of the containing class.	<ul style="list-style-type: none"> 1)/Product Observational/File Area Observational/Table Binary/Record Binary/Group Field Binary/group location 	<p>ASCII_NonNegative_Integer</p> <p><i>Units_of_Storage</i></p>
mars2020:group_spacing <i>IDENTIFICATION. RFX GROUP SPACING</i>	Distance between sounding groups (i.e. distance between soundings of a given mode) as set in activity uplink (actual distance may deviate slightly); 0 if not a Traverse sounding	<ul style="list-style-type: none"> 1)/Product Observational/Observation Area/Mission Area/Mars2020 Parameters/RIMFAX Parameters/group spacing 	<p>ASCII_Integer</p>
groups	The groups attribute provides a count of the total number of groups directly associated with a table record. Groups within groups within the record are not included in this count.	<ul style="list-style-type: none"> 1)/Product Observational/File Area Observational/Table Binary/Record Binary/groups 2)/Product Observational/File Area Observational/Table Binary/Record Binary/Group Field Binary/groups 3)/Product Collection/File Area Inventory/Inventory/Record Delimited/groups 4)/Product Observational/File Area Observational/Table Delimited/Record Delimited/groups 	<p>ASCII_NonNegative_Integer</p>
Identification_Area	The identification area consists of attributes that identify and name an object.	<ul style="list-style-type: none"> 1)/Product Document/Identification Area 2)/Product Bundle/Identification Area 3)/Product Collection/Identification Area 4)/Product Observational/Identification Area 	<ul style="list-style-type: none"> 1) logical_identifier 2) version_id 3) title 4) information_model_version 5) product_class 6) Alias_List 7) Citation_Information 8) Modification_History

<p>geom:index_id</p> <p><i>IDENTIFICATION.</i> ROVER_MOTION_COUNTER_NAME</p>	<p>The index_id attribute supplies a short name (identifier) for the associated value in a group of related values.</p> <p>Mars 2020 Specific: For the M20 rover: SITE, DRIVE, POSE, ARM, CHIMRA, DRILL, RSM, HGA, DRT, IC.</p> <p>For the M20 helicopter: FLIGHT, POS</p> <p>For the M20 LVS camera: SET, INSTANCE</p>	<p>1)/Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition/Coordinate Space Reference/Coordinate Space Indexed/Coordinate Space Index/index_id</p> <p>2)/Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Articulation Device Parameters[*]/Device Component State/Device Component State Index[*]/index_id</p> <p>3)/Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Articulation Device Parameters[*]/Device Temperature/Device Temperature Index[*]/index_id</p> <p>4)/Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Articulation Device Parameters[*]/Device Angle/Device Angle Index[*]/index_id</p> <p>5)/Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition[*]/Coordinate Space Present/Coordinate Space Indexed/Coordinate Space Index[*]/index_id</p> <p>6)/Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition[*]/Coordinate Space Reference/Coordinate Space Indexed/Coordinate Space Index[*]/index_id</p> <p>7)/Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Motion Counter/Motion Counter Index[*]/index_id</p>	<ol style="list-style-type: none"> 1) "SITE" 2) "DRIVE" 3) "POSE" 4) "ARM" 5) "SHA" 6) "DRILL" 7) "RSM" 8) "HGA" 9) "BITCAR" 10) "SEAL" 11) "RTT" 12) "PMC" 13) "FLIGHT" 14) "POS" 15) "SET" 16) "INSTANCE" 	<p>ASCII_Short_String_Collapsed</p>
<p>geom:index_value_angle</p> <p>* <i>ARTICULATION_STATE.</i> ARTICULATION_DEVICE_ANGLE * <i>ARTICULATION_STATE.</i> ARTICULATION_DEVICE_ANGLE_UNIT</p>	<p>The index_value_angle attribute provides the value of an angle as named by the associated index_id, index_name, or index_sequence_number.</p> <p>Mars 2020 Specific: Values are in radians.</p>	<p>1)/Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Articulation Device Parameters[*]/Device Angle/Device Angle Index[*]/index_value_angle</p>		<p>ASCII_Real</p> <p>Units_of_Angle</p>
<p>geom:index_value_number</p> <p>* <i>ARTICULATION_STATE.</i> ARTICULATION_DEVICE_TEMP_COUNT</p>	<p>The index_value_number attribute provides the value with no applicable units as named by the associated index_id or index_name.</p>	<p>1)/Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition/Coordinate Space Reference/Coordinate Space Indexed/Coordinate Space Index/index_value_number</p> <p>2)/Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition[*]/Coordinate Space Present/Coordinate Space Indexed/Coordinate Space Index[*]/index_value_number</p> <p>3)/Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition[*]/Coordinate Space Reference/Coordinate Space Indexed/Coordinate Space Index[*]/index_value_number</p> <p>4)/Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Motion Counter/Motion Counter Index[*]/index_value_number</p>		<p>ASCII_Real</p>
<p>geom:index_value_string</p> <p><i>ARM_ARTICULATION_STATE.</i> ART_DEV_COMPONENT_STATE_NAME <i>ARM_ARTICULATION_STATE.</i> CONTACT_SENSOR_STATE <i>INSTRUMENT_STATE_PARS.</i> DEVICE_COMPONENT_STATE</p>	<p>The index_value attribute provides the string value as named by the associated index_id or index_name.</p>	<p>1)/Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Articulation Device Parameters[*]/Device Component State/Device Component State Index[*]/index_value_string</p>	<ol style="list-style-type: none"> 1) "NO CONTACT" 2) "CONTACT" 	<p>ASCII_Short_String_Collapsed</p>
<p>geom:index_value_temperature</p> <p>* <i>ARTICULATION_STATE.</i> ARTICULATION_DEVICE_TEMP * <i>ARTICULATION_STATE.</i> ARTICULATION_DEVICE_TEMP_UNIT</p>	<p>The index_value_temperature attribute provides the value of a temperature as named by the associated index_id or index_name.</p>	<p>1)/Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Articulation Device Parameters[*]/Device Temperature/Device Temperature Index[*]/index_value_temperature</p>		<p>ASCII_Real</p> <p>Units_of_Temperature</p>

<p>information_model_version</p>	<p>The information_model_version attribute provides the version identification of the PDS Information Model on which the label and schema are based.</p>	<p>1)/Product Document/Identification Area/information_model_version</p> <p>2)/Product Bundle/Identification Area/information_model_version</p> <p>3)/Product Collection/Identification Area/information_model_version</p> <p>4)/Product Observational/Identification Area/information_model_version</p> <hr/> <p>1) "1.0.0.0" 2) "1.1.0.0" 3) "1.10.0.0" 4) "1.10.1.0" 5) "1.11.0.0" 6) "1.12.0.0" 7) "1.13.0.0" 8) "1.14.0.0" 9) "1.15.0.0" 10) "1.16.0.0" 11) "1.2.0.0" 12) "1.2.0.1" 13) "1.3.0.0" 14) "1.3.0.1" 15) "1.4.0.0" 16) "1.5.0.0" 17) "1.6.0.0" 18) "1.7.0.0" 19) "1.8.0.0" 20) "1.9.0.0" 21) "1.9.1.0"</p> <p>ASCII_Short_String_Collapsed</p>
<p>Internal_Reference</p> <p><i>DERIVED_IMAGE_PARM\$ FLAT_FIELD_FILE_NAME</i></p>	<p>The Internal_Reference class is used to cross-reference other products in PDS4-compliant registries of PDS and its recognized international partners.</p> <p>Mars 2020 Specific: <i>Specifies the name of the flat field file used for radiometric correction. This file should be in the calibration collection.</i></p>	<p>1)/Product Document/Context Area/Investigation Area/Internal Reference</p> <p>2)/Product Document/Context Area/Observing System/Observing System Component/Internal Reference</p> <p>3)/Product Collection/Reference List/Internal Reference[*]</p> <p>4)/Product Bundle/Context Area/Investigation Area/Internal Reference</p> <p>5)/Product Bundle/Context Area/Observing System/Observing System Component[*]/Internal Reference</p> <p>6)/Product Bundle/Context Area/Target Identification/Internal Reference</p> <p>7)/Product Bundle/Reference List/Internal Reference[*]</p> <p>8)/Product Collection/Context Area/Investigation Area/Internal Reference</p> <p>9)/Product Collection/Context Area/Observing System/Observing System Component[*]/Internal Reference</p> <p>10)/Product Collection/Context Area/Target Identification/Internal Reference</p> <p>11)/Product Observational/Observation Area/Investigation Area/Internal Reference</p> <p>12)/Product Observational/Observation Area/Observing System/Observing System Component[*]/Internal Reference</p> <p>13)/Product Observational/Observation Area/Target Identification/Internal Reference</p> <p>14)/Product Observational/Reference List/Internal Reference[*]</p> <hr/> <p>1) <i>lid_reference</i> 2) <i>lidvid_reference</i> 3) <i>reference_type</i> 4) <i>comment</i></p>
<p>Inventory</p>	<p>The Inventory class defines the inventory for members of a collection.</p>	<p>1)/Product Collection/File Area Inventory/Inventory</p>

		<ul style="list-style-type: none"> 1) Table_Delimited 2) name 3) reference_type 4) offset 5) records 6) local_identifier 7) object_length 8) record_delimiter 9) md5_checksum 10) parsing_standard_id 11) description 12) field_delimiter 13) Digital_Object 14) Uniformly_Sampled 15) Record_Delimited 	
Investigation_Area	The Investigation_Area class provides information about an investigation (mission, observing campaign or other coordinated, large-scale data collection effort).	<ul style="list-style-type: none"> 1) Product_Document/Context_Area/Investigation_Area 2) Product_Bundle/Context_Area/Investigation_Area 3) Product_Collection/Context_Area/Investigation_Area 4) Product_Observational/Observation_Area/Investigation_Area 	
		<ul style="list-style-type: none"> 1) name 2) type 3) Internal_Reference 	
keyword	The keyword attribute provides one or more words to be used for keyword search.	1) Product_Collection/Identification_Area/Citation_Information/keyword[*]	
			UTF8_Short_String_Collapsed
language	The language attribute provides the language used for definition and designation of the term.	1) Product_Document/Document/Document_Edition/language	
		1) "English"	ASCII_Short_String_Collapsed
lid_reference <i>DERIVED_IMAGE_INVERSE_LUT_FILE_NAME</i> <i>DERIVED_IMAGE_PARAMS</i> <i>FLAT_FIELD_FILE_NAME</i> <i>DERIVED_IMAGE_PARAMS</i> <i>STEREO_PRODUCT_ID</i> <i>DERIVED_IMAGE_PARAMS</i> <i>TARGET_INSTRUMENT</i> <i>IDENTIFICATION.TARGET_NAME</i> <i>IDENTIFICATION.TARGET_TYPE</i>	The lid_reference attribute provides the logical_identifier for a product.	<ul style="list-style-type: none"> 1) Product_Document/Context_Area/Investigation_Area/Internal_Reference/lid_reference 2) Product_Document/Context_Area/Observing_System/Observing_System_Component/Internal_Reference/lid_reference 3) Product_Collection/Reference_List/Internal_Reference[*]/lid_reference 4) Product_Bundle/Context_Area/Investigation_Area/Internal_Reference/lid_reference 5) Product_Bundle/Context_Area/Observing_System/Observing_System_Component[*]/Internal_Reference/lid_reference 6) Product_Bundle/Context_Area/Target_Identification/Internal_Reference/lid_reference 7) Product_Bundle/Reference_List/Internal_Reference[*]/lid_reference 8) Product_Bundle/Bundle_Member_Entry[*]/lid_reference 9) Product_Collection/Context_Area/Investigation_Area/Internal_Reference/lid_reference 10) Product_Collection/Context_Area/Observing_System/Observing_System_Component[*]/Internal_Reference/lid_reference 11) Product_Collection/Context_Area/Target_Identification/Internal_Reference/lid_reference 12) Product_Observational/Observation_Area/Investigation_Area/Internal_Reference/lid_reference 13) Product_Observational/Observation_Area/Observing_System/Observing_System_Component[*]/Internal_Reference/lid_reference 14) Product_Observational/Observation_Area/Target_Identification/Internal_Reference/lid_reference 15) Product_Observational/Reference_List/Internal_Reference[*]/lid_reference 	
			ASCII_LID
lidvid_reference	The lidvid_reference attribute provides the logical_identifier plus version_id, which uniquely identifies a product.	1) Product_Observational/Reference_List/Source_Product_Internal/lidvid_reference	

<p>IDENTIFICATION. PRODUCT_ID IDENTIFICATION. SOURCE_PRODUCT_ID</p>	<p>Mars 2020 Specific: For M2020, this keyword indicates the PRODUCT_ID (filename minus extension) of the EDRs (not RDRs) that were used to create this product. In an EDR, this keyword exists and refers to itself; i.e. it is equivalent to PRODUCT_ID.</p>		<p>ASCII_Short_String_Collapsed</p>
<p>mars2020:lis_soundings IDENTIFICATION. RFAX_LIS_SOUNDINGS</p>	<p>The number of soundings in a Long Integration Sounding (LIS) observation.</p>	<p>1)/Product Observational/Observation Area/Mission Area/Mars2020 Parameters/RIMFAX Parameters/lis_soundings</p>	<p>ASCII_Integer</p>
<p>local_identifier</p>	<p>The local_identifier attribute provides a character string which uniquely identifies the containing object within the label.</p>	<p>1)/Product Collection/File Area Inventory/File/local_identifier 2)/Product Observational/File Area Observational/Table Binary/local_identifier 3)/Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition[*]/local_identifier[*] 4)/Product Collection/File Area Inventory/Inventory/local_identifier 5)/Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/local_identifier 6)/Product Observational/File Area Observational/File/local_identifier 7)/Product Observational/File Area Observational/Table Delimited/local_identifier</p>	<p>ASCII_Local_Identifier</p>
<p>local_identifier_reference</p> <p>* COORDINATE_SYSTEM. REFERENCE_COORD_SYSTEM_INDEX * COORDINATE_SYSTEM. REFERENCE_COORD_SYSTEM_NAME * DERIVED_GEOMETRY_PARAMS. REFERENCE_COORD_SYSTEM_INDEX * DERIVED_GEOMETRY_PARAMS. REFERENCE_COORD_SYSTEM_NAME DERIVED_IMAGE_PARAMS. REFERENCE_COORD_SYSTEM_INDEX DERIVED_IMAGE_PARAMS. REFERENCE_COORD_SYSTEM_NAME GEOMETRIC_CAMERA_MODEL. REFERENCE_COORD_SYSTEM_INDEX GEOMETRIC_CAMERA_MODEL. REFERENCE_COORD_SYSTEM_NAME IDENTIFICATION_PRODUCT_ID SURFACE_MODEL_PARAMS. REFERENCE_COORD_SYSTEM_INDEX SURFACE_MODEL_PARAMS. REFERENCE_COORD_SYSTEM_NAME</p>	<p>The local_identifier_reference attribute provides the value of the local_identifier of the entity described by the referencing class. Note that a local_identifier attribute, with the same value as this local_identifier_reference, must be present within the label.</p> <p>Mars 2020 Specific: For M2020, EDRs use a standard, predefined frame name for each occurrence. However, RDRs can use any value available in COORDINATE_SYSTEM_NAME. Despite that, only a few frame names are commonly used. "SITE_FRAME" is used for most SITE, ROVER, and LOCAL_LEVEL_CS definitions, as well as for XYZ data and many mosaics. "ROVER_NAV_FRAME" is used for most other CS definitions, surface normals, camera models, and some mosaics. "LOCAL_LEVEL_FRAME" is used for some mosaics. PIXL_SENSOR_FRAME is defined in terms of PIXL_BASE_FRAME which is itself defined (as a constant) in terms of ARM_PIXL_FRAME.</p>	<p>1)/Product Observational/Observation Area/Discipline Area/Processing Information/Local Internal Reference/local_identifier_reference</p> <p>1) "SITE_FRAME" 2) "SITE_FRAME" 3) "ROVER_NAV_FRAME" 4) "ROVER_NAV_FRAME" 5) "ROVER_NAV_FRAME" 6) "ROVER_NAV_FRAME" 7) "SITE_FRAME" 8) "ROVER_NAV_FRAME" 9) "ROVER_NAV_FRAME" 10) "PIXL_BASE_FRAME" 11) "ARM_PIXL_FRAME"</p>	<p>ASCII_Local_Identifier_Reference</p>
<p>Local_Internal_Reference</p>	<p>The Local Internal_Reference class is used to cross-reference other Description Objects in a PDS4 label.</p>	<p>1)/Product Observational/Observation Area/Discipline Area/Processing Information/Local Internal Reference</p> <p>1) comment 2) local_identifier_reference 3) local_reference_type</p>	
<p>local_mean_solar_time</p> <p>IDENTIFICATION. LOCAL_MEAN_SOLAR_TIME</p>	<p>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.</p> <p>Mars 2020 Specific: For M2020, 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 "Sol-00027M00:00:00.000" to "Sol-00027M23:59:999".</p>	<p>1)/Product Observational/Observation Area/Time Coordinates/local_mean_solar_time</p>	<p>ASCII_Short_String_Collapsed</p>
<p>local_reference_type</p>	<p>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.</p>	<p>1)/Product Observational/Observation Area/Discipline Area/Processing Information/Local Internal Reference/local_reference_type</p>	

			ASCII_Short_String_Collapsed
local_true_solar_time <i>IDENTIFICATION. LOCAL_TRUE_SOLAR_TIME</i>	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.	1)/ Product Observational/Observation Area/Time Coordinates/local true solar time	ASCII_Short_String_Collapsed
logical_identifier <i>IDENTIFICATION. PRODUCT_ID</i>	A logical identifier identifies the set of all versions of an object. It is an object identifier without a version.	1)/ Product Document/Identification Area/logical identifier 2)/ Product Bundle/Identification Area/logical identifier 3)/ Product Collection/Identification Area/logical identifier 4)/ Product Observational/Identification Area/logical identifier	ASCII_LID
mars2020:Mars2020_Parameters	The Mars2020_Parameters class is a superclass containing all Mars2020 mission classes.	1)/ Product Observational/Observation Area/Mission Area/Mars2020_Parameters 1) mars2020:Observation_Information 2) mars2020:MOXIE_Parameters 3) mars2020:PIXL_Parameters 4) mars2020:RIMFAX_Parameters 5) mars2020:SHERLOC_Parameters 6) mars2020:SuperCam_Parameters	
maximum_field_length	The maximum_field_length attribute sets an upper, inclusive bound on the number of bytes in the field.	1)/ Product Collection/File Area Inventory/Inventory/Record Delimited/Field Delimited[*]/maximum field length	ASCII_NonNegative_Integer <i>Units_of_Storage</i>
maximum_record_length	The maximum_record_length attribute provides the maximum length of a record, including the record delimiter.	1)/ Product Collection/File Area Inventory/Inventory/Record Delimited/maximum record length	ASCII_NonNegative_Integer <i>Units_of_Storage</i>
member_status	The member_status attribute indicates whether the collection is primary and whether the file_specification_name has been provided for the product_collection label.	1)/ Product Bundle/Bundle Member Entry[*]/member status 1) "Primary" 2) "Secondary"	ASCII_Short_String_Collapsed
Mission_Area	The mission area allows the insertion of mission specific metadata.	1)/ Product Observational/Observation Area/Mission Area 1) Mars2020_Parameters	
mars2020:mission_phase_name	The mission_phase_name identifies a time period within the mission.	1)/ Product Observational/Observation Area/Mission Area/Mars2020_Parameters/Observation_Information/mission_phase_name 1) "ATLO" 2) "Cruise" 3) "Development" 4) "Surface Mission" 5) "Test"	ASCII_Short_String_Preserved
modification_date	The modification_date attribute provides date the modifications were completed	1)/ Product Bundle/Identification Area/Modification History/Modification Detail/modification date 2)/ Product Collection/Identification Area/Modification History/Modification Detail/modification date 3)/ 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 Bundle/Identification Area/Modification History/Modification Detail 2)/ Product Collection/Identification Area/Modification History/Modification Detail 3)/ Product Observational/Identification Area/Modification History/Modification Detail	

		<ul style="list-style-type: none"> 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.	<ul style="list-style-type: none"> 1) Product Bundle/Identification Area/Modification History 2) Product Collection/Identification Area/Modification History 3) 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.	<ul style="list-style-type: none"> 1) Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Motion Counter 1) name 2) local_identifier 3) geom: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.	<ul style="list-style-type: none"> 1) Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Motion Counter/Motion Counter Index* 1 1) geom:List_Index_No_Units 2) geom:index_sequence_number 3) geom:index_name 4) geom:index_id 5) geom:index_value_number 	
name	The name attribute provides a word or combination of words by which the object is known.	<ul style="list-style-type: none"> 1) Product Document/Context Area/Investigation Area/name 2) Product Document/Context Area/Observing System/name 3) Product Document/Context Area/Observing System/Observing System Component/name 4) Product Bundle/Context Area/Investigation Area/name 5) Product Bundle/Context Area/Observing System/Observing System Component[*]/name 6) Product Bundle/Context Area/Target Identification/name 7) Product Observational/File Area Observational/Table Binary/name 8) Product Observational/File Area Observational/Table Binary/Record Binary/Group Field Binary/Field Binary/name 9) Product Collection/Context Area/Investigation Area/name 10) Product Collection/Context Area/Observing System/Observing System Component[*]/name 11) Product Collection/Context Area/Target Identification/name 12) Product Collection/File Area Inventory/Inventory/Record Delimited/Field Delimited[*]/name 13) Product Observational/Observation Area/Investigation Area/name 14) Product Observational/Observation Area/Observing System/Observing System Component[*]/name 15) Product Observational/Observation Area/Target Identification/name 16) Product Observational/File Area Observational/Table Delimited/name 17) Product Observational/File Area Observational/Table Delimited/Record Delimited/Field Delimited[*]/name 	
			UTF8_Short_String_Collapsed

mars2020:note	This note field can be used to indicate that the attenuation values are in dB because there is no unit_of_measure for such units.	1)/ Product Observational/Observation Area/Mission Area/Mars2020 Parameters/RIMFAX Parameters/note
mars2020:number_of_samples <i>IDENTIFICATION. RFAX_NUMBER_OF_SAMPLES</i>	Number of samples in each sounding.	1)/ Product Observational/Observation Area/Mission Area/Mars2020 Parameters/RIMFAX Parameters/number_of_samples ASCII_Integer
mars2020:number_of_sweeps <i>IDENTIFICATION. RFAX_NUMBER_OF_SWEEPS</i>	Number of sweeps that are integrated internally in the radar.	1)/ Product Observational/Observation Area/Mission Area/Mars2020 Parameters/RIMFAX Parameters/number_of_sweeps ASCII_Integer
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) Context Area 2) comment 3) Time Coordinates 4) Investigation Area 5) Primary Result Summary 6) Observing System 7) Target Identification 8) Mission Area 9) Discipline Area
mars2020:Observation_Information	The Observation_Information class provides information about a science observation.	1)/ Product Observational/Observation Area/Mission Area/Mars2020 Parameters/Observation Information 1) mars2020:release_number 2) mars2020:mission_phase_name 3) mars2020:product_type_name 4) mars2020:spacecraft_clock_start 5) mars2020:spacecraft_clock_stop 6) mars2020:spacecraft_clock_partition 7) mars2020:sol_number 8) mars2020:start_sol_number 9) mars2020:stop_sol_number 10) mars2020:start_local_mean_solar_time 11) mars2020:stop_local_mean_solar_time 12) mars2020:start_local_true_solar_time 13) mars2020:start_local_true_solar_time_sol 14) mars2020:stop_local_true_solar_time 15) mars2020:stop_local_true_solar_time_sol 16) mars2020:start_solar_longitude 17) mars2020:stop_solar_longitude 18) mars2020:active_flight_computer 19) mars2020:start_mars_year 20) mars2020:stop_mars_year
Observing_System	The Observing System class describes the entire suite used to collect the data.	1)/ Product Document/Context Area/Observing System 2)/ Product Bundle/Context Area/Observing System 3)/ Product Collection/Context Area/Observing System 4)/ Product Observational/Observation Area/Observing System 1) name 2) description 3) Observing System Component 4) Conceptual_Object 5) Physical_Object
Observing_System_Component <i>IDENTIFICATION. INSTRUMENT_ID</i>	The Observing System Component class describes one or more subsystems used to collect data.	1)/ Product Document/Context Area/Observing System/Observing System Component 2)/ Product Bundle/Context Area/Observing System/Observing System Component[*] 3)/ Product Collection/Context Area/Observing System/Observing System Component[*] 4)/ Product Observational/Observation Area/Observing System/Observing System Component[*]

		1) FRONT_HAZCAM_LEFT_A 2) FRONT_HAZCAM_LEFT_B 3) FRONT_HAZCAM_RIGHT_A 4) FRONT_HAZCAM_RIGHT_B 5) REAR_HAZCAM_LEFT 6) REAR_HAZCAM_RIGHT 7) NAVCAM_LEFT 8) NAVCAM_RIGHT 9) CACHECAM 10) SUPERCAM_RMI 11) MCZ_LEFT 12) MCZ_RIGHT 13) SHERLOC_WATSON 14) SHERLOC_ACI 15) PIXL_MCC 16) SKYCAM 17) LCAM 18) EDL_PUCAM1 19) EDL_PUCAM2 20) EDL_PUCAM3 21) EDL_DDCAM 22) EDL_RDCAM 23) EDL_RUCAM 24) EDL_MICROPHONE 25) HELI_NAV 26) HELI_RTE 27) MEDA_ENVIRONMENT 28) MOXIE 29) PIXL_ENGINEERING 30) PIXL_SPECTROMETER 31) SUPERCAM_NONIMAGE 32) SHERLOC_SPECTROMETER 33) RIMFAX_MOBILE 34) RIMFAX_STATIONARY	
offset SYSTEM. LBLSIZE	The offset attribute provides the displacement of the object starting position from the beginning of the parent structure (file, record, etc.). If there is no displacement, offset=0.	1)/ Product Observational/File Area Observational/Table Binary/offset 2)/ Product Collection/File Area Inventory/Inventory/offset 3)/ Product Observational/File Area Observational/Table Delimited/offset	ASCII_NonNegative_Integer Units_of_Storage
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 Collection/File Area Inventory/Inventory/parsing_standard_id 2)/ Product Observational/File Area Observational/Table Delimited/parsing_standard_id 1) "PDS DSV 1"	ASCII_Short_String_Collapsed
geom:positive_azimuth_direction *_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. Mars 2020 Specific: For the M2020 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/positive_azimuth_direction 2)/ Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition["]/positive_azimuth_direction 1) "CLOCKWISE"	ASCII_Short_String_Collapsed
geom:positive_elevation_direction *_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. Mars 2020 Specific: For the M2020 operational coordinate frames, which follow the Mars Pathfinder convention, increasing elevation ("UP")	1)/ Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition/positive_elevation_direction 2)/ Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition["]/positive_elevation_direction	

	<i>moves towards the negative Z axis.</i>	1) "UP"	ASCII_Short_String_Collapsed
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 Bundle/Context Area/Primary Result Summary 2)/ Product Collection/Context Area/Primary Result Summary	
		1) type 2) purpose 3) data_regime 4) processing_level 5) processing_level_id 6) description 7) Science_Facets	
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) proc:process_owner_name 4) proc:process_owner_institution_name 5) proc:Software	
proc: process_owner_institution_name <i>IDENTIFICATION. PRODUCER_INSTITUTION_NAME</i>	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 1) "MULTIMISSION INSTRUMENT PROCESSING LAB 2) JET PROPULSION LAB"	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) proc:Input_Product_List 3) proc:Process	
processing_level	The processing_level attribute provides a broad classification of data processing level.	1)/ Product Collection/Context Area/Primary Result Summary/processing_level[*] 2)/ Product Bundle/Context Area/Primary Result Summary/processing_level[*] 3)/ Product Collection/Context Area/Primary Result Summary/processing_level 1) "Calibrated" 2) "Derived" 3) "Partially Processed" 4) "Raw" 5) "Telemetry"	ASCII_Short_String_Collapsed
Product_Bundle	A Product_Bundle is an aggregate product and has a table of references to one or more collections.	1)/ Product Bundle 1) Product 2) Context Area 3) Identification Area 4) Reference List 5) Bundle 6) File_Area_Text 7) Bundle_Member_Entry	
product_class	The product_class attribute provides the name of the product class.	1)/ Product Document/Identification Area/product class 2)/ Product Bundle/Identification Area/product class 3)/ Product Collection/Identification Area/product class 4)/ Product Observational/Identification Area/product class	

		<ul style="list-style-type: none"> 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_SPIKE_Kernel" 25) "Product_Service" 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" 	ASCII_Short_String_Collapsed
Product_Collection	A Product_Collection has a table of references to one or more basic products. The references are stored in a table called the inventory.	1) Product_Collection	
		<ul style="list-style-type: none"> 1) Product 2) Context Area 3) Identification Area 4) Reference List 5) Collection 6) File Area Inventory 	
msn_surface: product_completion_status <i>TELEMETRY: PRODUCT_COMPLETION_STATUS</i>	<p>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.</p> <p>Mars 2020 Specific: <i>For M2020, the valid values indicate whether it was a complete or partial product as it came out of MPCs, and whether the checksum passed, failed, or was missing.</i></p>	1) Product Observational/Observation Area/Discipline Area/Surface Mission Information/Telemetry/product completion status	
		<ul style="list-style-type: none"> 1) "PARTIAL" 2) "PARTIAL_CHECKSUM_FAIL" 3) "COMPLETE_CHECKSUM_PASS" 4) "COMPLETE_NO_CHECKSUM" 5) "COMPLETE_CHECKSUM_FAIL" 	ASCII_Short_String_Collapsed
Product_Document	A Product Document is a product consisting of a single logical document that may comprise one or more document editions.	1) Product Document	
		<ul style="list-style-type: none"> 1) Product 2) Context Area 3) Identification Area 4) Reference List 5) Document 	
Product_Observational	A Product_Observational is a set of one or more information objects produced by an observing system.	1) Product Observational	
		<ul style="list-style-type: none"> 1) Product 2) Identification Area 3) Observation Area 4) Reference List 5) File Area Observational 6) File Area Observational_Supplemental 	
proc: program_version	The program_version attribute specifies the version of the software program.	1) Product Observational/Observation Area/Discipline Area/Processing Information/Process/Software/Software Program/program_version	
			ASCII_Short_String_Collapsed

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/Discipline Area/Surface Mission Information/Telemetry/provider_id 1) "MPCS_M2020_DP" ASCII_Short_String_Collapsed
publication_date	The publication_date attribute provides the date on which an item was published.	1)/ Product Document/Document/publication_date ASCII_Date_YMD
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 Document/Identification Area/Citation Information/publication_year 2)/ Product Bundle/Identification Area/Citation Information/publication_year 3)/ Product Collection/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 Bundle/Context Area/Primary Result Summary/purpose 2)/ Product Collection/Context Area/Primary Result Summary/purpose 1) "Calibration" 2) "Checkout" 3) "Engineering" 4) "Navigation" 5) "Observation Geometry" 6) "Science" 7) "Supporting Observation" ASCII_Short_String_Collapsed
geom:qcos	qcos is the scalar component of a quaternion. $qcos = \cos(\theta/2)$, where θ is the angle of rotation.	1)/ Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition/Quaternion Plus Direction/qcos 2)/ Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition[*]/Quaternion Plus Direction/qcos ASCII_Real
geom:qsin1	qsin1 is the first element of the vector component of a quaternion. $qsin1 = x \cdot \sin(\theta/2)$ where θ is the angle of rotation and (x,y,z) is the unit vector around which the rotation occurs.	1)/ Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition/Quaternion Plus Direction/qsin1 2)/ Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition[*]/Quaternion Plus Direction/qsin1 ASCII_Real
geom:qsin2	qsin2 is the second element of the vector component of a quaternion. $qsin2 = y \cdot \sin(\theta/2)$ where θ is the angle of rotation and (x,y,z) is the unit vector around which the rotation occurs.	1)/ Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition/Quaternion Plus Direction/qsin2 2)/ Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition[*]/Quaternion Plus Direction/qsin2 ASCII_Real
geom:qsin3	qsin3 is the third element of the vector component of a quaternion. $qsin3 = z \cdot \sin(\theta/2)$ where θ is the angle of rotation and (x,y,z) is the unit vector around which the rotation occurs.	1)/ Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition/Quaternion Plus Direction/qsin3 2)/ Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition[*]/Quaternion Plus Direction/qsin3 ASCII_Real
geom:quaternion_measurement_method	Specifies the method by which the coordinate space was measured. This provides an indication of the quality of the definition.	1)/ Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition/Coordinate Space Quality/quaternion_measurement_method 2)/ Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition[*]/Coordinate Space Quality/quaternion_measurement_method

		<ul style="list-style-type: none"> 1) "Bundle_Adjustment" 2) "Coarse" 3) "Fine" 4) "Sun_Find" 5) "Tilt_Only" 6) "Unknown" 	ASCII_Short_String_Collapsed
<p>geom:Quaternion_Plus_Direction</p> <p>*_COORDINATE_SYSTEM. ORIGIN_ROTATION_QUATERNION ARM_COORDINATE_SYSTEM. ORIGIN_ROTATION_QUATERNION LANDER_COORDINATE_SYSTEM. ORIGIN_ROTATION_QUATERNION</p>	<p>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 definition of Quaternion_Base for more details on the quaternion classes in this dictionary.</p>	<p>1)/Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition/Quaternion_Plus_Direction</p> <p>2)/Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition[*]/Quaternion_Plus_Direction</p> <ul style="list-style-type: none"> 1) geom.qcos 2) geom.qsin1 3) geom.rotation_direction 4) geom.qsin2 5) geom.qsin3 	
<p>mars2020:receive_only</p> <p>IDENTIFICATION. RFX_RECEIVE_ONLY</p>	<p>True if the radar is in passive mode, false if it is in active (normal radar) mode.</p>	<p>1)/Product Observational/Observation Area/Mission Area/Mars2020 Parameters/RIMFAX Parameters/receive_only</p>	ASCII_Boolean
<p>msn_surface:received_packets</p> <p>TELEMETRY. RECEIVED_PACKETS</p>	<p>The received_packets attribute provides the total number of telemetry packets actually used to construct this data product. cf. expected_packets.</p> <p>Mars 2020 Specific: For M2020, telemetry data processing does not track "packets", but instead data product "parts".</p>	<p>1)/Product Observational/Observation Area/Discipline Area/Surface Mission Information/Telemetry/received_packets</p>	ASCII_NonNegative_Integer
<p>Record_Binary</p>	<p>The Record_Binary class is a component of the table class and defines a record of the table.</p>	<p>1)/Product Observational/File Area Observational/Table Binary/Record_Binary</p> <ul style="list-style-type: none"> 1) fields 2) record_length 3) groups 4) Field_Binary 5) Group_Field_Binary 	
<p>Record_Delimited</p>	<p>The Record_Delimited class is a component of the delimited table (spreadsheet) class and defines a record of the delimited table.</p>	<p>1)/Product Collection/File Area Inventory/Inventory/Record_Delimited</p> <p>2)/Product Observational/File Area Observational/Table Delimited/Record_Delimited</p> <ul style="list-style-type: none"> 1) fields 2) maximum_record_length 3) groups 4) Field_Delimited 5) Group_Field_Delimited 	
<p>record_delimiter</p>	<p>The record_delimiter attribute provides the character or characters used to indicate the end of a record.</p>	<p>1)/Product Collection/File Area Inventory/Inventory/record_delimiter</p> <p>2)/Product Observational/File Area Observational/Table Delimited/record_delimiter</p> <ul style="list-style-type: none"> 1) "Carriage-Return Line-Feed" 2) "Line-Feed" 3) "carriage-return line-feed" 	ASCII_Short_String_Collapsed
<p>record_length</p>	<p>The record_length attribute provides the length of a record, including a record delimiter, if present.</p>	<p>1)/Product Observational/File Area Observational/Table Binary/Record_Binary/record_length</p>	<p>ASCII_NonNegative_Integer</p> <p>Units_of_Storage</p>
<p>records</p>	<p>The records attribute provides a count of records.</p>	<p>1)/Product Observational/File Area Observational/Table Binary/records</p> <p>2)/Product Collection/File Area Inventory/Inventory/records</p> <p>3)/Product Observational/File Area Observational/Table Delimited/records</p>	ASCII_NonNegative_Integer

Reference_List	The Reference_List class provides general references, cross-references, and source products for the product. References cited elsewhere in the label need not be repeated here.	1)/ Product Collection/Reference List 2)/ Product Bundle/Reference List 3)/ Product Observational/Reference List 4) Internal Reference 5) External Reference 6) Source Product Internal 7) Source Product External	
reference_text	The reference_text attribute provides a complete bibliographic citation for a published work.	1)/ Product Bundle/Reference List/External Reference[*]/reference_text	UTF8_Text_Collapsed
reference_type	The reference_type attribute provides the name of the association.	1)/ Product Document/Context Area/Investigation Area/Internal Reference/reference_type 2)/ Product Document/Context Area/Observing System/Observing System Component/Internal Reference/reference_type 3)/ Product Collection/Reference List/Internal Reference[*]/reference_type 4)/ Product Bundle/Context Area/Investigation Area/Internal Reference/reference_type 5)/ Product Bundle/Context Area/Observing System/Observing System Component[*]/Internal Reference/reference_type 6)/ Product Bundle/Context Area/Target Identification/Internal Reference/reference_type 7)/ Product Bundle/Reference List/Internal Reference[*]/reference_type 8)/ Product Bundle/Bundle Member Entry[*]/reference_type 9)/ Product Observational/Reference List/Source Product Internal/reference_type 10)/ Product Collection/Context Area/Investigation Area/Internal Reference/reference_type 11)/ Product Collection/Context Area/Observing System/Observing System Component[*]/Internal Reference/reference_type 12)/ Product Collection/Context Area/Target Identification/Internal Reference/reference_type 13)/ Product Collection/File Area Inventory/Inventory/reference_type 14)/ Product Observational/Observation Area/Investigation Area/Internal Reference/reference_type 15)/ Product Observational/Observation Area/Observing System/Observing System Component[*]/Internal Reference/reference_type 16)/ Product Observational/Observation Area/Target Identification/Internal Reference/reference_type 17)/ Product Observational/Reference List/Internal Reference[*]/reference_type	ASCII_Short_String_Collapsed
mars2020:release_number	release_number is the identifier of a scheduled release of Mars 2020 data from PDS. The first Mars 2020 data release has release_number "01". 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/Mars2020 Parameters/Observation Information/release_number	ASCII_Short_String_Collapsed
repetitions	The repetitions attribute provides the number of times a set of repeating fields and, possibly, (sub)groups is replicated within a group.	1)/ Product Observational/File Area Observational/Table Binary/Record Binary/Group Field Binary/repetitions	ASCII_NonNegative_Integer
msn_surface:request_id IDENTIFICATION.REQUEST_ID	The request_id is used to group related datasets together by science or engineering application or theme, such as frames in a mosaic.	1)/ Product Observational/Observation Area/Discipline Area/Surface Mission Information/Command Execution/request_id	ASCII_Short_String_Collapsed
mars2020:RIMFAX_Parameters	Container for the attributes describing a RIMFAX observation	1)/ Product Observational/Observation Area/Mission Area/Mars2020 Parameters/RIMFAX_Parameters	

		<ol style="list-style-type: none"> 1) mars2020:config_id 2) mars2020:decimation 3) mars2020:setup_file 4) mars2020:calibration 5) mars2020:gate_frequency 6) mars2020:number_of_samples 7) mars2020:number_of_sweeps 8) mars2020:receive_only 9) mars2020:rx_delay 10) mars2020:rx_attenuation 11) mars2020:start_frequency 12) mars2020:stop_frequency 13) mars2020:sweep_time 14) mars2020:tx_delay 15) mars2020:tx_attenuation 16) mars2020:group_spacing 17) mars2020:sinetable 18) mars2020:lis_soundings 19) mars2020:note 20) mars2020:start_utc 21) mars2020:stop_utc 22) mars2020:start_jdate 23) mars2020:stop_jdate 24) mars2020:start_sounding_counter 25) mars2020:stop_sounding_counter 26) mars2020:min_rover_lat 27) mars2020:max_rover_lat 28) mars2020:min_rover_lon 29) mars2020:max_rover_lon 30) mars2020:min_rover_elev 31) mars2020:max_rover_elev 	
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 identified in the enclosing classes.	<ol style="list-style-type: none"> 1) Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition/Quaternion Plus Direction/rotation_direction 2) Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition*/Quaternion Plus Direction/rotation_direction 	
		<ol style="list-style-type: none"> 1) "Forward" 2) "From Base" 3) "Present to Reference" 4) "Reference to Present" 5) "Reverse" 6) "Toward Base" 	ASCII_Short_String_Collapsed
mars2020:rx_attenuation <i>IDENTIFICATION. RFAX_RX_ATTENUATION</i>	Attenuation in the receive path; higher values represent more dampening of the received signal	1) Product Observational/Observation Area/Mission Area/Mars2020 Parameters/RIMFAX Parameters/rx_attenuation	ASCII_Integer
mars2020:rx_delay <i>IDENTIFICATION. RFAX_RX_DELAY</i>	Time delay of receiver gate	1) Product Observational/Observation Area/Mission Area/Mars2020 Parameters/RIMFAX Parameters/rx_delay	ASCII_Integer <i>Units_of_Time</i>
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.	<ol style="list-style-type: none"> 1) Product Bundle/Context Area/Primary Result Summary/Science_Facets 2) Product Collection/Context Area/Primary Result Summary/Science_Facets 	
		<ol style="list-style-type: none"> 1) wavelength_range 2) domain 3) Discipline_Facets 4) discipline_name 	
geom:selected_instrument_id <i>ARM ARTICULATION_STATE. ARTICULATION_DEV_INSTRUMENT_ID</i>	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[2]/selected_instrument_id	ASCII_Short_String_Collapsed
		<ol style="list-style-type: none"> 1) "TURRET" 2) "DRILL" 3) "DOCKING POST" 4) "PIXL" 5) "GDRT" 6) "FCS" 7) "WATSON" 8) "SHERLOC" 9) "CUSTOM TCP" 	

msn_surface: sequence_execution_count TELEMETRY. SEQUENCE_EXECUTION_COUNT	The sequence_execution_count specifies how many times this sequence has executed since the last reset of the flight computer. Mars 2020 Specific: For M2020, this means RCE (Rover Compute Element) start-up or boot, which happens every time the rover wakes up (generally daily).	1)/ Product Observational/Observation Area/Discipline Area/Surface Mission Information/Command Execution/sequence execution count ASCII_NonNegative_Integer
msn_surface: sequence_id IDENTIFICATION. SEQUENCE_ID	The sequence_id identifies the command sequence used to acquire this product. Mars 2020 Specific: For M20, this consists of two components. First, a 4-letter "category" which typically corresponds to the relevant FSW subsystem (e.g. "eng_" for surface engineering sequences) or payload (e.g. "zcam" for Mastcam-Z sequences). Second, a 5-digit unique number for the sequence.	1)/ Product Observational/Observation Area/Discipline Area/Surface Mission Information/Command Execution/sequence_id ASCII_Short_String_Collapsed
msn_surface: sequence_version_id IDENTIFICATION. SEQUENCE_VERSION_ID	The sequence_version_id identifies which of potentially several versions of a sequence_id were used to acquire this product. Mars 2020 Specific: Note that sequence versions start at 1, so a value of 0 indicates there was no sequence involved in the acquisition	1)/ Product Observational/Observation Area/Discipline Area/Surface Mission Information/Command Execution/sequence_version_id ASCII_Short_String_Collapsed
mars2020: setup_file IDENTIFICATION. RFAX_SETUP_FILE	Name of the setup file.	1)/ Product Observational/Observation Area/Mission Area/Mars2020 Parameters/RIMFAX Parameters/setup_file ASCII_Short_String_Collapsed
mars2020: sinetable IDENTIFICATION. RFAX_SINETABLE	Sine table used to create the radar bandwidth sweep.	1)/ Product Observational/Observation Area/Mission Area/Mars2020 Parameters/RIMFAX Parameters/sinetable ASCII_Short_String_Collapsed
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) proc:Software_Program
proc: Software_Program	The Software_Program class describes the specific components or tasks of the Software executed in producing the data product.	1)/ Product Observational/Observation Area/Discipline Area/Processing Information/Process/Software/Software_Program 1) name 2) proc:program_type_name 3) proc:program_user 4) proc:program_hostname 5) proc:program_path 6) proc:program_version 7) proc:program_start_date_time 8) proc:program_stop_date_time 9) description 10) proc:Software_Program_Parameters
mars2020: sol_number	Sol_number is the number of the Mars day on which an observation was acquired. Landing day is Sol 0.	1)/ Product Observational/Observation Area/Mission Area/Mars2020 Parameters/Observation Information/sol_number ASCII_Integer
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.	1)/ Product Observational/Observation Area/Time Coordinates/solar_longitude ASCII_Real Units_of_Angle
geom: solution_id *_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 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	1)/ Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition/Coordinate Space Present/Coordinate Space Indexed/solution_id 2)/ Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition[*]/Coordinate Space Present/Coordinate Space Indexed/solution_id

	<p>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.</p> <p>Mars 2020 Specific: For M2020, when in a COORDINATE_SYSTEM group, the SOLUTION_ID specifies the ID of the coordinate system being defined in that group. It 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. 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.</p>		ASCII_Short_String_Collapsed
Source_Product_Internal	The Source_Product_Internal class is used to reference one or more source products in the PDS4 registry system. A source product contains input data for the creation of this product.	1)/Product Observational/Reference List/Source Product Internal	
		1) lidvid_reference 2) reference_type 3) comment	
mars2020:spacecraft_clock_partition	The spacecraft_clock_partition provides the clock partition active for the spacecraft_clock_start and spacecraft_clock_stop attributes. This attribute may be used when the spacecraft_clock values do not include a partition number.	1)/Product Observational/Observation Area/Mission Area/Mars2020 Parameters/Observation Information/spacecraft_clock partition	
			ASCII_Integer
mars2020:spacecraft_clock_start	The spacecraft_clock_start is the value of the spacecraft clock at the beginning of an observation, in seconds. Values are formed according to the pattern [p/]ddddddddd[.ffffff], where p is an optional partition number, dddddddd is a whole number of seconds up to 10 digits, and .ffffff is an optional fraction of a second up to 9 digits. The whole number and fraction are separated by a period. If a partition number and slash are not present, then the attribute spacecraft_clock_partition must be used.	1)/Product Observational/Observation Area/Mission Area/Mars2020 Parameters/Observation Information/spacecraft_clock_start	
			ASCII_Short_String_Collapsed
mars2020:spacecraft_clock_stop	The spacecraft_clock_stop is the value of the spacecraft clock at the end of an observation, in seconds. Values are formed according to the pattern [p/]ddddddddd[.ffffff], where p is an optional partition number, dddddddd is a whole number of seconds up to 10 digits, and .ffffff is an optional fraction of a second up to 9 digits. The whole number and fraction are separated by a period. If a partition number and slash are not present, then the attribute spacecraft_clock_partition must be used.	1)/Product Observational/Observation Area/Mission Area/Mars2020 Parameters/Observation Information/spacecraft_clock_stop	
			ASCII_Short_String_Collapsed
geom:spice_kernel_file_name TELEMETRY.SPICE_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	
			ASCII_File_Name
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) geom: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) geom:spice_kernel_file_name 3) geom:kernel_provenance 4) Internal_Reference	
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. Mars 2020 Specific: For M2020, the time period of interest is returned from SPICE subroutines and based on the beginning of data acquisition.	1)/Product Bundle/Context Area/Time Coordinates/start_date_time 2)/Product Collection/Context Area/Time Coordinates/start_date_time 3)/Product Observational/Observation Area/Time Coordinates/start_date_time	

			ASCII_Date_Time_YMD_UTC
mars2020:start_frequency <i>IDENTIFICATION. RFAX_START_FREQUENCY</i>	Start frequency of recorded bandwidth range (same as stop_frequency for single-frequency Passive Meas)	1)/ Product Observational/Observation Area/Mission Area/Mars2020 Parameters/RIMFAX Parameters/start_frequency	ASCII_Integer <i>Units_of_Frequency</i>
mars2020:start_local_mean_solar_time	Start_local_mean_solar_time is the local mean solar time, as defined in the main PDS4 data dictionary, at the beginning of an observation.	1)/ Product Observational/Observation Area/Mission Area/Mars2020 Parameters/Observation Information/start local mean solar time	ASCII_Short_String_Collapsed
mars2020:start_local_true_solar_time	Start_local_true_solar_time is the local true solar time, as defined in the main PDS4 data dictionary, at the beginning of an observation.	1)/ Product Observational/Observation Area/Mission Area/Mars2020 Parameters/Observation Information/start local true solar time	ASCII_Short_String_Collapsed
mars2020:start_local_true_solar_time_sol	The start_local_true_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 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. Start_local_true_solar_time_sol should accompany the attribute start_local_true_solar_time if that attribute's value does not include a sol number prefix.	1)/ Product Observational/Observation Area/Mission Area/Mars2020 Parameters/Observation Information/start local true solar time sol	ASCII_Integer
mars2020:start_solar_longitude	Start_solar_longitude is the solar longitude, as defined in the main PDS4 data dictionary, at the beginning of an observation.	1)/ Product Observational/Observation Area/Mission Area/Mars2020 Parameters/Observation Information/start solar longitude	ASCII_Real <i>Units_of_Angle</i>
stop_date_time <i>IDENTIFICATION. STOP_TIME</i>	The stop_date_time attribute provides the date and time appropriate to the end of the product being labeled.	1)/ Product Bundle/Context Area/Time Coordinates/stop_date_time 2)/ Product Collection/Context Area/Time Coordinates/stop_date_time 3)/ Product Observational/Observation Area/Time Coordinates/stop_date_time	ASCII_Date_Time_YMD_UTC
mars2020:stop_frequency <i>IDENTIFICATION. RFAX_STOP_FREQUENCY</i>	Stop frequency of recorded bandwidth range (same as start_frequency for single-frequency Passive Meas)	1)/ Product Observational/Observation Area/Mission Area/Mars2020 Parameters/RIMFAX Parameters/stop_frequency	ASCII_Integer <i>Units_of_Frequency</i>
msn_surface:Surface_Mission_Information	The Surface_Mission_Information class contains attributes specific to surface missions which apply across instrument types.	1)/ Product Observational/Observation Area/Discipline Area/Surface Mission Information 1) msn_surface:surface_gravity 2) msn_surface:Command_Execution 3) msn_surface:Telemetry 4) msn_surface:Observational_Intent 5) msn_surface:Commanded_Parameters	
mars2020:sweep_time <i>IDENTIFICATION. RFAX_SWEEP_TIME</i>	Duration of radar-signal generation sweep through frequency bandwidth, for Active Meas; Duration of receive-only sweep through frequency bandwidth, for Passive Meas	1)/ Product Observational/Observation Area/Mission Area/Mars2020 Parameters/RIMFAX Parameters/sweep_time	ASCII_Real <i>Units_of_Time</i>
Table_Binary	The Table Binary class is an extension of table base and defines a simple binary table.	1)/ Product Observational/File Area Observational/Table Binary 1) name 2) offset 3) record_delimiter 4) local_identifier 5) records 6) md5_checksum 7) description 8) Uniformly_Sampled 9) Record_Binary 10) Digital_Object	

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) Parsable_Byte_Stream 2) name 3) offset 4) records 5) local_Identifier 6) object_length 7) record_delimiter 8) md5_checksum 9) parsing_standard_id 10) description 11) field_delimiter 12) Digital_Object 13) Uniformly_Sampled 14) Record_Delimited
Target_Identification	The Target_Identification class provides detailed target identification information.	1)/ Product Bundle/Context Area/Target Identification 2)/ Product Collection/Context Area/Target Identification 3)/ Product Observational/Observation Area/Target Identification 1) name 2) alternate_designation 3) type 4) description 5) Internal_Reference
msn_surface: Telemetry	The Telemetry class contains downlink-related attributes used primarily during mission operations.	1)/ Product Observational/Observation Area/Discipline Area/Surface Mission Information/Telemetry 1) msn_surface:application_id 2) msn_surface:application_subtype_id 3) msn_surface:application_name 4) msn_surface:provider_id 5) msn_surface:flight_software_version_id 6) msn_surface:telemetry_source_name 7) msn_surface:telemetry_alternate_name 8) msn_surface:transport_protocol 9) msn_surface:communication_session_id 10) msn_surface:telemetry_source_start_time 11) msn_surface:telemetry_source_sclk_start 12) msn_surface:product_completion_status 13) msn_surface:earth_received_start_date_time 14) msn_surface:earth_received_stop_date_time 15) msn_surface:download_priority 16) msn_surface:data_size 17) msn_surface:expected_packets 18) msn_surface:received_packets 19) msn_surface:telemetry_source_host_name 20) msn_surface:expected_transmission_path 21) msn_surface:transmission_path 22) msn_surface:flight_software_mode 23) msn_surface:telemetry_source_size 24) msn_surface:telemetry_source_checksum 25) msn_surface:auto_delete_flag 26) msn_surface:virtual_channel_id
msn_surface: telemetry_source_checksum TELEMETRY. TELEMETRY_SOURCE_CHECKSUM	Specifies the checksum for the telemetry stream from which this product was derived. Mars 2020 Specific: For M2020, it is the sum of each (unsigned) byte in the data areas of all DPOs. It does not include the DPO headers. For M20 LVS, it is instead just the sum of all pixel values in the image.	1)/ Product Observational/Observation Area/Discipline Area/Surface Mission Information/Telemetry/telemetry_source_checksum ASCII_Integer
msn_surface: telemetry_source_host_name TELEMETRY. TELEMETRY_SOURCE_HOST_NAME	Specifies the name of the host venue that provided the telemetry source data used in the creation of this data set. Mars 2020 Specific: For M2020, example is "M2020mstbgds1".	1)/ Product Observational/Observation Area/Discipline Area/Surface Mission Information/Telemetry/telemetry_source_host_name 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. Mars 2020 Specific: For M2020, in most cases this is the name of the data product, for example "MczRScidata_0123456789-00000-1.dat". For	1)/ Product Observational/Observation Area/Discipline Area/Surface Mission Information/Telemetry/telemetry_source_name

	<i>helicopter and LVS images, this is the name of the image supplied by the respective team after their preprocessing.</i>		ASCII_Short_String_Collapsed
msn_surface:telemetry_source_sclk_start <i>TELEMETRY. TELEMETRY_SOURCE_SCLK_START</i>	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. Mars 2020 Specific: <i>For M2020, it refers to the creation time (DVT) of the onboard DPO and comes from the secondary packet header. Note that this is the SCLK used by Data Management operationally to identify data products.</i>	1)/ Product Observational/Observation Area/Discipline Area/Surface Mission Information/Telemetry/telemetry_source_sclk_start	ASCII_Short_String_Collapsed
msn_surface:telemetry_source_size <i>TELEMETRY. TELEMETRY_SOURCE_SIZE</i>	Specifies the length in bytes of the telemetry stream from which this product was derived. Mars 2020 Specific: <i>For M2020, it is the length of the user portion of the Data Product Object (DPO).</i>	1)/ Product Observational/Observation Area/Discipline Area/Surface Mission Information/Telemetry/telemetry_source_size	ASCII_Integer
msn_surface:telemetry_source_start_time <i>IDENTIFICATION. TELEMETRY_SOURCE_START_TIME</i>	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 (SCTE).	1)/ Product Observational/Observation Area/Discipline Area/Surface Mission Information/Telemetry/telemetry_source_start_time	ASCII_Date_Time_DOY_UTC
Time_Coordinates	The Time_Coordinates class provides a list of time coordinates.	1)/ Product Bundle/Context Area/Time Coordinates 2)/ Product Collection/Context Area/Time Coordinates 3)/ 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 <i>IDENTIFICATION. INSTRUMENT_ID</i>	The title attribute provides a short, descriptive text string suitable use as a title or brief description in display or listing of products.	1)/ Product Document/Identification Area/title 2)/ Product Bundle/Identification Area/title 3)/ Product Collection/Identification Area/title 4)/ Product Observational/Identification Area/title	
			UTF8_Short_String_Collapsed
msn_surface:transmission_path <i>TELEMETRY. TRANSMISSION_PATH</i>	Indicates the actual transmission path (route) for the telemetry data. See also expected_transmission_path and communication_session_id.	1)/ Product Observational/Observation Area/Discipline Area/Surface Mission Information/Telemetry/transmission_path	ASCII_Short_String_Collapsed
msn_surface:transport_protocol <i>TELEMETRY. TELEMETRY_SOURCE_TYPE</i>	The transport_protocol attribute specifies the protocol used in the creation of the telemetry data products by the subsystem which generates the telemetry stream. Mars 2020 Specific: <i>For most products, this is "DATA PRODUCT", since that's what comes down for the spacecraft. For Heli and LVS images, the value is "TEAM-GENERATED IMAGE", indicating that the "telemetry" source from the IDS perspective is an image that was pre-processed by the helicopter or LVS teams.</i>	1)/ Product Observational/Observation Area/Discipline Area/Surface Mission Information/Telemetry/transport_protocol	ASCII_Short_String_Collapsed
		1) "DATA PRODUCT" 2) "TEAM-GENERATED IMAGE"	
mars2020:tx_attenuation <i>IDENTIFICATION. RFAX_TX_ATTENUATION</i>	Attenuation in the transmit path, higher values represent lower output power	1)/ Product Observational/Observation Area/Mission Area/Mars2020_Parameters/RIMFAX_Parameters/tx_attenuation	ASCII_Integer
mars2020:tx_delay <i>IDENTIFICATION. RFAX_TX_DELAY</i>	Time delay of transmitter gate	1)/ Product Observational/Observation Area/Mission Area/Mars2020_Parameters/RIMFAX_Parameters/tx_delay	ASCII_Integer <i>Units_of_Time</i>

<p>type</p>	<p>The type attribute classifies Investigation_Area according to the scope of the investigation..</p>	<p>1)/Product Document/Context Area/Investigation Area/type</p> <p>2)/Product Document/Context Area/Observing System/Observing System Component/type</p> <p>3)/Product Bundle/Context Area/Investigation Area/type</p> <p>4)/Product Bundle/Context Area/Observing System/Observing System Component[*]/type</p> <p>5)/Product Bundle/Context Area/Target Identification/type</p> <p>6)/Product Collection/Context Area/Investigation Area/type</p> <p>7)/Product Collection/Context Area/Observing System/Observing System Component[*]/type</p> <p>8)/Product Collection/Context Area/Target Identification/type</p> <p>9)/Product Observational/Observation Area/Investigation Area/type</p> <p>10)/Product Observational/Observation Area/Observing System/Observing System Component[*]/type</p> <p>11)/Product Observational/Observation Area/Target Identification/type</p>	<p>ASCII_Short_String_Collapsed</p>
<p>geom:Vector_Origin_Offset</p> <p>* COORDINATE_SYSTEM. ORIGIN_OFFSET_VECTOR ARM_COORDINATE_SYSTEM. ORIGIN_OFFSET_VECTOR LANDER_COORDINATE_SYSTEM. ORIGIN_OFFSET_VECTOR</p>	<p>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.</p>	<p>1)/Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition/Vector Origin_Offset</p> <p>2)/Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition[*]/Vector Origin_Offset</p> <p>1) geom:Vector_Cartesian_Position_Base 2) geom:x_position 3) geom:y_position 4) geom:z_position</p>	
<p>version_id</p> <p>IDENTIFICATION. PRODUCT_ID</p>	<p>The version_id attribute provides the version of the product, expressed in the PDS [m.n] notation.</p>	<p>1)/Product Document/Identification Area/version_id</p> <p>2)/Product Bundle/Identification Area/version_id</p> <p>3)/Product Bundle/Identification Area/Modification History/Modification Detail/version_id</p> <p>4)/Product Collection/Identification Area/version_id</p> <p>5)/Product Collection/Identification Area/Modification History/Modification Detail/version_id</p> <p>6)/Product Observational/Identification Area/version_id</p> <p>7)/Product Observational/Identification Area/Modification History/Modification Detail/version_id</p>	<p>ASCII_Short_String_Collapsed</p>
<p>msn_surface:virtual_channel_id</p> <p>TELEMETRY. VIRTUAL_CHANNEL_ID</p>	<p>Specifies the type of data flowing in the telemetry virtual channel.</p> <p>Mars 2020 Specific:</p> <p><i>The Virtual Channel Identifier is used by M2020 to identify the RCE string generating the Transfer Frame, and to indicate the type of data flowing in the telemetry virtual channel. RCE String A is indicated by all Virtual Channel Identifier values having a '0' as the high bit (e.g., virtual channels 0 to 31); RCE String B is indicated by all Virtual Channel Identifier values having a '1' for the high bit (e.g., virtual channels 32 to 63).</i></p>	<p>1)/Product Observational/Observation Area/Discipline Area/Surface Mission Information/Telemetry/virtual_channel_id</p>	<p>ASCII_Integer</p>
<p>wavelength_range</p>	<p>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.</p>	<p>1)/Product Bundle/Context Area/Primary Result Summary/Science Facets/wavelength_range</p> <p>2)/Product Collection/Context Area/Primary Result Summary/Science Facets/wavelength_range</p>	

		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
geom:x_position	The x component of a Cartesian position vector.	1)/ Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition/Vector Origin Offset/x_position 2)/ Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition[*]/Vector Origin Offset/x_position	ASCII_Real Units_of_Length
geom:y_position	The y component of a Cartesian position vector.	1)/ Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition/Vector Origin Offset/y_position 2)/ Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition[*]/Vector Origin Offset/y_position	ASCII_Real Units_of_Length
geom:z_position	The z component of a Cartesian position vector.	1)/ Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition/Vector Origin Offset/z_position 2)/ Product Observational/Observation Area/Discipline Area/Geometry/Geometry Lander/Coordinate Space Definition[*]/Vector Origin Offset/z_position	ASCII_Real Units_of_Length