VCO FITS header keyword dictionary version 7

Contents

1 Notes

1. Special prefixes for keyword.
   - Keyword prefixed with 'P_' is common keyword for all camera.
   - Keyword prefixed with 'S_' is common keyword for all camera, but is calculated using SPICE.
   - Keyword prefixed with 'UV_' is UVI-specific keyword.
   - Keyword prefixed with 'I1_' is IR1-specific keyword.
   - Keyword prefixed with 'I2_' is IR2-specific keyword.
   - Keyword prefixed with 'LI_' is LIR-specific keyword.
2. Rules on comments.
   - Use small letter as default.
   - If you use abbreviation, use only capital letter.
   - First character of proper noun should be capital letter, such as Venus.
   - Name of keyword, value of keyword, name of coordinate axis and units are allowed to use capital letter.
   - If the value of keyword have units, you must include unit in the comments with brackets [ ].
   - Use units as written in FITS Standard.

This dictionary corresponds to the dictionary versions as follows:

- P_DVER: 20191112
- UV_DVER: 20180424
- I1_DVER: 20180817
- I2_DVER: 20161218
- LI_DVER: 20180210

2 Description of the format of this dictionary

2.1 KEYWORD

2.1.1 Attributes

- lastupdate: date of last update in ISO 8601 format (YYYY-MM-DD)
- status: status of the keyword (null, proposed, approved or obsoleted)
- reference: name of the reference and link to the URL that documents the keyword if present.
- hdu: allowed type of HDU; primary, extension, image, table, or any
- datatype: string, logical, integer, or real
- comment: short description of the keyword
- level: exists in what level; L1, L2, any
- pds3: (possible) name of entry corresponding to PDS3 label.
- unit: name of unit appeared in PDS3 label.

2.1.2 Definition

full description of the keyword

2.1.3 Example(s)

- example(s) of the keyword value.

3 Standard Keywords

4 Commonly used Keywords

4.1 SIMPLE

4.1.1 Attributes

- reference: FITS Standard 4.0
- hdu: primary
- datatype: logical
- comment: conformity to FITS standard
- level: any
- pds3: (None)
- unit: (None)

4.1.2 Definition

The value field shall contain a logical constant with the value T if the file conforms to this standard. This keyword is mandatory for the primary header and must not appear in extension headers. A value of F signifies that the file does not conform to this standard.

4.1.3 Example(s)

- T

4.2 BITPIX

4.2.1 Attributes

- reference: FITS Standard 4.0
- hdu: any
- datatype: integer
- comment: number of bits per data pixel
- level: any
- pds3: (None)
- unit: (None)

4.2.2 Definition

The value field shall contain an integer. The absolute value is used in computing the sizes of data structures. It shall specify the number of bits that represent a data value in the associated data array. The only valid values of BITPIX are 8, 16, 32, 64, -32 and -64. Writers of FITS arrays should select a BITPIX data type appropriate to the form, range of values, and accuracy of the data in the array.

4.2.3 Example(s)

- 16
- -32

4.3 NAXIS

4.3.1 Attributes

- reference: FITS Standard 4.0
- hdu: any
- datatype: integer
- comment: number of data axes
- level: any
- pds3: (None)
- unit: (None)

4.3.2 Definition

The value field shall contain a non-negative integer no greater than 999 representing the number of axes in the associated data array. A value of zero signifies that no data follow the header in the HDU.

4.3.3 Example(s)

- 0

4.4 EXTEND

4.4.1 Attributes

- reference: FITS Standard 4.0
- hdu: primary
- datatype: logical
- comment: possibility of presence of extensions
- level: any
- pds3: (None)
- unit: (None)

4.4.2 Definition

The value field shall contain a logical value indicating whether the FITS file is allowed to contain conforming extensions following the primary HDU. This keyword may only appear in the primary header and must not appear in an extension header. If the value field is T then there may be conforming extensions in the FITS file following the primary HDU. This keyword is only advisory, so its presence with a value T does not require that the FITS file contains extensions, nor does the absence of this keyword necessarily imply that the file does not contain extensions.

4.4.3 Example(s)

- T

4.5 ORIGIN

4.5.1 Attributes

- reference: FITS Standard 4.0

- hdu: any
- datatype: string
- comment: organization responsible for the data
- level: any
- pds3: PRODUCER_ID
- unit: (None)

4.5.2 Definition

The value field shall contain a character string identifying the organization or institution responsible for creating the FITS file.

4.5.3 Example(s)

- 'ISAS/JAXA'
- 'VCO/UVI team'
- 'VCO/LEON team'
- 'VCO/LIR team'

4.6 NEXTEND

4.6.1 Attributes

- reference: NOAO FITS Keyword Dictionary: Version 1.0
- hdu: primary
- datatype: integer
- comment: number of standard extensions
- level: any
- pds3: (None)
- unit: (None)

4.6.2 Definition

The value field shall contain a non-negative integer giving the number of standard extensions contained in the FITS file. This keyword may only be used in the primary array header.

4.6.3 Example(s)

- 1

4.7 TELESCOP

4.7.1 Attributes

- reference: FITS Standard 4.0
- hdu: any
- datatype: string
- comment: telescope used to acquire data
- level: any
- pds3: (None)
- unit: (None)

4.7.2 Definition

The value field shall contain a character string identifying the telescope used to acquire the data associated with the header.

4.7.3 Example(s)

- 'VCO'

4.8 END

4.8.1 Attributes

- reference: FITS Standard 4.0
- hdu: any
- datatype:
- comment:
- level: any
- pds3: (None)
- unit: (None)

4.8.2 Definition

This keyword has no associated value. Bytes 9 through 80 shall be filled with ASCII spaces (decimal 32 or hexadecimal 20). The END keyword marks the logical end of the header and must occur in the last 2880-byte FITS block of the header.

4.8.3 Example(s)

- (Note: this keyword doesn't have value.)

4.9 XTENSION

4.9.1 Attributes

- reference: FITS Standard 4.0
- hdu: extension
- datatype: string
- comment: type of extension
- level: any
- pds3: (None)
- unit: (None)

4.9.2 Definition

The value field shall contain a character string giving the name of the extension type. This keyword is mandatory for an extension header and must not appear in the primary header. To preclude conflict, extension type names must be registered with the IAUFWG. An up-to-date list is maintained on the FITS Support Office web site.

4.9.3 Example(s)

- 'IMAGE'

4.10 DATE

4.10.1 Attributes

- reference: FITS Standard 4.0
- hdu: any
- datatype: string
- comment:
  - primary: date of file creation in UTC
  - extension: date of generation of this HDU in UTC
- level: any
- pds3: PRODUCT_CREATION_TIME
- unit: (None)

4.10.2 Definition

The value field shall contain a character string giving the date on which the HDU was created, in the form YYYY-MM-DD, or the date and time when the HDU was created, in the form YYYY-MM-DDThh:mm:ss[.sss...], where YYYY shall be the four-digit calendar year number, MM the two-digit month number with January given by 01 and December by 12, and DD the two-digit day of the month. When both date and time are given, the literal T shall separate the date and time, hh shall be the two-digit hour in the day, mm the two-digit number of minutes after the hour, and ss[.sss...] the number of seconds (two digits followed by an optional fraction) after the minute. Default values must not be given to any portion of the date/time string, and leading zeros must not be omitted. The decimal part of the seconds field is optional and may be arbitrarily long, so long as it is consistent with the rules for value formats of Sect. 4.2 in the reference. Otherwise said, the format for DATE keywords written after January 1, 2000 shall be the ISO-8601 datetime form described in Sect. 9.1.1 in the reference. See also Sect. 9.5 in the reference. The value of the DATE keyword shall always be expressed in UTC when in this format, for all data sets created on Earth.

4.10.3 Example(s)

- '2016-08-30T13:31:25'

4.11 DATE-BEG

4.11.1 Attributes

- reference: FITS Standard 4.0
- hdu: image
- datatype: string
- comment: date of the start of observation in UTC
- level: any
- pds3: START_TIME
- unit: (None)

4.11.2 Definition

The value field shall contain a character string that gives the date on which the observation started in UTC. This keyword has the same format, and is used in conjunction with, the standard DATA-END keyword that gives the ending date of the observation, and the standard DATE-OBS keyword that gives the date of middle of the observation. These three keywords may give the full date and time using the 'YYYY-MM-DDThh:mm:ss[.sss]' format.

4.11.3 Example(s)

- '2016-05-02T12:25:32.045'
- 'N/A'

4.12 DATE-OBS

4.12.1 Attributes

- reference: FITS Standard 4.0
- hdu: image
- datatype: string
- comment: date of the middle of observation in UTC
- level: any
- pds3: OBSERVATION_TIME
- unit: (None)

4.12.2 Definition

The value field shall contain a character string that gives the date on which the middle of the observation in UTC. This keyword has the same format, and is used in conjunction with, the standard DATA-END keyword that gives the ending date of the observation, and the standard DATE-OBS keyword that gives the date of middle of the observation. These three keywords may give the full date and time using the 'YYYY-MM-DDThh:mm:ss[.sss]' format.

4.12.3 Example(s)

- '2016-05-02T12:25:33.045'
- 'N/A'

4.13 DATE-END

4.13.1 Attributes

- reference: FITS Standard 4.0
- hdu: image
- datatype: string
- comment: date of the end of observation in UTC
- level: any
- pds3: STOP_TIME
- unit: (None)

4.13.2 Definition

The value field shall contain a character string that gives the date on which the observation ended in UTC. This keyword has the same format, and is used in conjunction with, the standard DATA-BEG keyword that gives the starting date of the observation and the standard DATA-OBS keyword that gives the date of middle of the observation. These three keywords may give the full date and time using the 'YYYY-MM-DDThh:mm:ss[.sss]' format.

4.13.3 Example(s)

- '2016-05-02T12:25:34.045'
- 'N/A'

4.14 NAXISn

4.14.1 Attributes

- reference: FITS Standard 4.0
- hdu: any
- datatype: integer
- comment: length of data axis n
- level: any
- pds3: LINE_SAMPLES, LINES
- unit: (None)

4.14.2 Definition

The NAXISn keywords must be present for all values n = 1, . . . , NAXIS, in increasing order of n, and for no other values of n. The value field of this indexed keyword shall contain a non-negative integer representing the number of elements along axis n of a data array. A value of zero for any of the NAXISn signifies that no data follow the header in the HDU. If NAXIS is equal to 0, there shall not be any NAXISn keywords.

4.14.3 Example(s)

- 1024

4.15 PCOUNT

4.15.1 Attributes

- reference: FITS Standard 4.0
- hdu: any
- datatype: integer
- comment: number of parameters per group
- level: any
- pds3: (None)
- unit: (None)

4.15.2 Definition

The value field shall contain an integer that shall be used in any way appropriate to define the data structure, consistent with Eq. 2 in the reference. In IMAGE and TABLE extensions this keyword must have the value 0; in BINTABLE extensions it is used to specify the number of bytes that follow the main data table in the supplemental data area called the heap. This keyword is also used in the random groups structure to specify the number of parameters preceding each array in a group.

4.15.3 Example(s)

- 0

4.16 GCOUNT

4.16.1 Attributes

- reference: FITS Standard 4.0
- hdu: any
- datatype: integer
- comment: number of groups
- level: any
- pds3: (None)
- unit: (None)

4.16.2 Definition

The value field shall contain an integer that shall be used in any way appropriate to define the data structure, consistent with Eq. 2 in the reference. This keyword must have the value 1 in the IMAGE, TABLE and BINTABLE standard extensions. This keyword is also used in the random groups structure to specify the number of random groups present.

4.16.3 Example(s)

- 1

4.17 EXTNAME

4.17.1 Attributes

- reference: FITS Standard 4.0
- hdu: extension
- datatype: string
- comment: name of this HDU
- level: any
- pds3: (None)
- unit: (None)

4.17.2 Definition

The value field shall contain a character string to be used to distinguish among different extensions of the same type, i.e., with the same value of XTENSION, in a FITS file. Within this context, the primary array should be considered as equivalent to an IMAGE extension.

4.17.3 Example(s)

- 'UVI-LEVEL1b'
- 'UVI-LEVEL2b'
- 'IR1-LEVEL1b'
- 'IR1-LEVEL2b'
- 'IR2-LEVEL1b'
- 'IR2-LEVEL2b'
- 'LIR-LEVEL1b'
- 'LIR-LEVEL2b'
- 'Latitude'
- 'Longitude'
- 'Local time'
- 'Phase angle'
- 'Incidence angle'
- 'Emission angle'
- 'Azimuthal angle'
- 'LL Latitude'
- 'LL Longitude'
- 'LL Local time'
- 'LL Phase angle'
- 'LL Incidence angle'
- 'LL Emission angle'
- 'LL Azimuthal angle'

4.18 EXTVER

4.18.1 Attributes

- reference: FITS Standard 4.0
- hdu: extension
- datatype: integer
- comment: version of EXTNAME
- level: any
- pds3: (None)
- unit: (None)

4.18.2 Definition

The value field shall contain an integer which is used to distinguish among different extensions in a FITS file with the same type and name, i.e., the same values for XTENSION and EXTNAME. The values need not start with 1 for the first extension with a particular value of EXTNAME and need not be in sequence for subsequent values. If the EXTVER keyword is absent, the file should be treated as if the value were 1.

4.18.3 Example(s)

- 0

4.19 INSTRUME

4.19.1 Attributes

- reference: FITS Standard 4.0
- hdu: image
- datatype: string
- comment: name of instrument
- level: any
- pds3: INSTRUMENT_NAME
- unit: (None)

4.19.2 Definition

The value field shall contain a character string identifying the instrument used to acquire the data.

4.19.3 Example(s)

- 'Ultra Violet Imager'
- '1-micron Camera'
- '2-micron Camera'
- 'Longwave Infrared Camera'

4.20 OBJECT

4.20.1 Attributes

- reference: FITS Standard 4.0
- hdu: image
- datatype: string
- comment: name of observed object
- level: any
- pds3: TARGET_BODY
- unit: (None)

4.20.2 Definition

The value field shall contain a character string giving a name for the object observed.

4.20.3 Example(s)

- 'VENUS'
- 'STAR'
- 'EARTH'
- 'N/A'

4.21 COMMENT

4.21.1 Attributes

- reference: FITS Standard 4.0

- hdu: any
- datatype:
- comment:
- level: any
- pds3: (None)
- unit: (None)

4.21.2 Definition

This keyword may be used to supply any comments regarding the FITS file.

4.21.3 Example(s)

- (Note: this keyword doesn't have value.)

4.22 HISTORY

4.22.1 Attributes

- reference: FITS Standard 4.0
- hdu: any
- datatype:
- comment:
- level: any
- pds3: (None)
- unit: (None)

4.22.2 Definition

This keyword should be used to describe the history of steps and procedures associated with the processing of the associated data.

4.22.3 Example(s)

- (Note: this keyword doesn't have value.)

4.23 BUNIT

4.23.1 Attributes

- reference: FITS Standard 4.0
- hdu: image
- datatype: string
- comment: physical units of the array values
- level: any
- pds3: UNIT
- unit: (None)

4.23.2 Definition

The value field shall contain a character string describing the physical units in which the quantities in the array are expressed. These units must follow the prescriptions of Sect. 4.3 in the reference.

4.23.3 Example(s)

- 'COUNT'
- 'W/m2/sr/m'
- 'mW/cm2/um/sr'
- 'W mˆ-2 srˆ-1 umˆ-1'
- 'K'

4.24 DATAMAX

4.24.1 Attributes

- reference: FITS Standard 4.0
- hdu: image
- datatype: real
- comment: maximum data value
- level: any
- pds3: MAXIMUM, MAXIMUM_LATITUDE, MAXIMUM_LONGITUDE, MAXIMUM_LOCAL_TIME, MAXIMUM_PHASE_ANGLE, MAXIMUM_INCIDENCE_ANGLE, MAXIMUM_EMISSION_ANGLE
- unit: (None)

4.24.2 Definition

The value field shall always contain a floating-point number, regardless of the value of BITPIX. This number shall give the maximum valid physical value represented by the array (from Eq. 3 in the reference), exclusive of any IEEE754 special values.

4.24.3 Example(s)

- 65535.0

4.25 DATAMIN

4.25.1 Attributes

- reference: FITS Standard 4.0
- hdu: image
- datatype: real
- comment: minimum data value
- level: any
- pds3: MINIMUM, MINIMUM_LATITUDE, MINIMUM_LONGITUDE, MINIMUM_LOCAL_TIME, MINIMUM_PHASE_ANGLE, MINIMUM_INCIDENCE_ANGLE, MINIMUM_EMISSION_ANGLE
- unit: (None)

4.25.2 Definition

The value field shall always contain a floating-point number, regardless of the value of BITPIX. This number shall give the minimum valid physical value represented by the array (from Eq. 3 in the reference), exclusive of any IEEE754 special values.

4.25.3 Example(s)

- 0.0

4.26 FILENAME

4.26.1 Attributes

- reference: FITS Standard 4.0
- hdu: primary
- datatype: string
- comment: original filename
- level: any
- pds3: FILE_NAME
- unit: (None)

4.26.2 Definition

The value field shall contain a character string giving the the host file name used to record the original data. The value has the format "CAM_YYYYMMDD_hhmmss_FILTER_LEVEL_vVER.fit" where CAM is abbreviated name of camera, i.e., uvi, ir1, ir2, and lir, YYYY is four-digits year, MM is month, DD is day, hh is hour, mm is minute and ss is second. MM, DD, hh, mm, and ss have two-digits and zero-padded values. FILTER is abbreviation of filter name or type of image with 3 characters. FILTER is [283, dif, 365, sht] for uvi, [09d, 09n, 097, 101, dif, drk] for ir1, [174, 226, 232, 202, 165, drk] for ir2, and [pic, opn, sht] for lir. LEVEL is name of product, i.e., l1b, l2b, or geo. VER is the version string of the product with 2 digit that is larger than or equal to 10 for public release. The version string for the public release is equal to the number that is calculated by multiplying version number in the value of DATA_SET_ID for PDS3 label by 10.

4.26.3 Example(s)

- 'lir_20160711_092102_pic_l2b_v10.fit'
- 'uvi_20151207_051953_283_l1b_v20.fit'

4.27 EXPOSURE

4.27.1 Attributes

- reference: HEASARC The Recommended Columns and Keywords for a FITS Event List
- hdu: image
- datatype: real, string
- comment: exposure time [s]
- level: any
- pds3: EXPOSURE_DURATION
- unit: s

4.27.2 Definition

The value field shall contain a floating-point number giving the exposure time of the observation in units of seconds. This value is not always equal to the value that is difference with the value of DATE-END and the value of DATE-BEG. For LIR, this value always become 'N/A' because exposure time doesn't have physical meaning.

4.27.3 Example(s)

- 0.046
- 'N/A'

5 VCO Common Keywords

5.1 FMTTYPE

5.1.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: primary
- datatype: string
- comment: type of format in FITS file
- level: any
- pds3: (None)
- unit: (None)

5.1.2 Definition

The value field shall contain a character string, to be used to ensure a unique identification of the format type.

5.1.3 Example(s)

- 'VCO IMAGE UVI L1b'
- 'VCO IMAGE UVI L2b'
- 'VCO IMAGE IR1 L1b'
- 'VCO IMAGE IR1 L2b'
- 'VCO IMAGE IR2 L1b'
- 'VCO IMAGE IR2 L2b'
- 'VCO IMAGE LIR L1b'
- 'VCO IMAGE LIR L2b'
- 'VCO IMAGE GEOMETRY'

5.2 FTYPEVER

5.2.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: primary

- datatype: integer
- comment: version of FMTTYPE definition
- level: any
- pds3: (None)
- unit: (None)

5.2.2 Definition

The value field shall contain an integer, to be used to distinguish among different formats with the same format type, i.e., the same value for FMTTYPE.

5.2.3 Example(s)

- 2016083001

5.3 SPCECRFT

5.3.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: any
- datatype: string
- comment: name of spacecraft
- level: any
- pds3: SPACECRAFT_ID
- unit: (None)

5.3.2 Definition

The value field shall contain a character string identifying the spacecraft used to acquire the data.

5.3.3 Example(s)

- 'VCO'

5.4 CNTTYPE

5.4.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: primary
- datatype: string
- comment: type of data content
- level: any
- pds3: (None)
- unit: (None)

5.4.2 Definition

The value field shall contain a character string to be used to identify the content in a format type.

5.4.3 Example(s)

- 'N/A'

5.5 CNTVER

5.5.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: primary
- datatype: integer, string
- comment: version of data content
- level: any
- pds3: (None)
- unit: (None)

5.5.2 Definition

The value field shall contain an integer, to be used to distinguish among different contents with the same content type, i.e., the same value for CNTTYPE.

5.5.3 Example(s)

- 'N/A'

5.6 P_L0NAME

5.6.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: any
- datatype: string
- comment: filename of raw image in level 0
- level: any
- pds3: (None)
- unit: (None)

5.6.2 Definition

The value field shall contain a character string giving the filename of the raw image data in Level 0 that is the source of this file.

5.6.3 Example(s)

- 'vcouvi000177A95E29_0077.img'

5.7 P_MEAN

5.7.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: mean value of the data
- level: any
- pds3: MEAN
- unit: (None)

5.7.2 Definition

The value field shall contain a floating-point number that gives mean value of the data array.

5.7.3 Example(s)

- 4.92

5.8 P_STDDEV

5.8.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: standard deviation of the data
- level: any
- pds3: STANDARD_DEVIATION
- unit: (None)

5.8.2 Definition

The value field shall contain a floating-point number that gives standard deviation of the data array.

5.8.3 Example(s)

- 48.63

5.9 FILTER

5.9.1 Attributes

- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: filter name
- level: any

- pds3: FILTER_NAME
- unit: (None)

5.9.2 Definition

The value field shall contain a character string that gives the name of the filter that was used during the observation to select or modify the radiation that was transmitted to the detector. The value 'none' or 'NONE' indicates that no filter was used.

5.9.3 Example(s)

- '283 nm'
- 'diffuser'
- 'shutter'
- '365 nm'
- '0.90 um day'
- '0.90 um night'
- '0.97 um'
- '1.01 um'
- 'dark'
- '1.735 um'
- '2.26 um'
- '2.32 um'
- '2.02 um'
- '1.65 um'
- 'none'

5.10 P_ID

5.10.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: VCO instrument/filter ID
- level: any
- pds3: (None)
- unit: (None)

5.10.2 Definition

The value field shall contain a character string that gives NAIF ID of the instrument.

5.10.3 Example(s)

- 'VCO_UVI_283'
- 'VCO_UVI_283_TOPOB'
- 'VCO_UVI_DIF'
- 'VCO_UVI_DIF_TOPOB'
- 'VCO_UVI_SHT'
- 'VCO_UVI_SHT_TOPOB'

- ‘VCO_UVI_365’
- ‘VCO_UVI_365_TOPOB’
- ‘VCO_IR1_09d’
- ‘VCO_IR1_09n’
- ‘VCO_IR2_097’
- ‘VCO_IR2_101’
- ‘VCO_IR2_DIF’
- ‘VCO_IR2_DRK’
- ‘VCO_IR2_174’
- ‘VCO_IR2_226’
- ‘VCO_IR2_232’
- ‘VCO_IR2_202’
- ‘VCO_IR2_165’
- ‘VCO_LIR_OPN’
- ‘VCO_LIR_PIC’
- ‘VCO_LIR_SHT’

5.11 P_OBSPRG

5.11.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: observation program ID
- level: any
- pds3: VCO:OBSERVATION_PROGRAM_ID
- unit: (None)

5.11.2 Definition

The value field shall contain a character string that gives the observation program number in hexadecimal and the version number for the observation program number, separated with ’_v’. The observation program number is within the range from 0x00 to 0x1f. Please refer vco_obsprg_v*.pdf about what the value means in detail.

5.11.3 Example(s)

- ‘0x05_v2’
- ‘0x1f_v1’

5.12 P_OPNAME

5.12.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: obs. prg. name
- level: any
- pds3: OBSERVATION_NAME

- unit: (None)

5.12.2 Definition

The value field shall contain a character string that gives the name of the observation program. The observation program is specified by the value of P_OBSPRG.

5.12.3 Example(s)

- 'dayside deluxe (IR1, IR2, UVI, LIR)'

5.13 P_OPDATE

5.13.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: start time of observation program execution
- level: any
- pds3: (None)
- unit: (None)

5.13.2 Definition

The value field shall contain a character string that gives the date on which the observation program started in UTC. The observation program is specified by the value of P_OBSPRG. This keyword has the same format with DATE, DATE-BEG, DATE-OBS, and DATE-END. This keyword may give the full date and time using the 'YYYY-MM-DDThh:mm:ss[.sss]' format.

5.13.3 Example(s)

- '2015-12-07T05:18:42'

5.14 P_BINN

5.14.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: integer
- comment: number of pixels for binning: 1 2 4 8
- level: any
- pds3: (None)
- unit: (None)

5.14.2 Definition

The value field shall contain a positive integer that gives the number of binning of the original image pixels for the array.

5.14.3 Example(s)

- 1
- 2

5.15 P_POSLLX

5.15.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: integer
- comment: x-pos of lower-left corner pixel of image
- level: any
- pds3: (None)
- unit: (None)

5.15.2 Definition

The value field shall contain a positive integer that gives x-position at the lower-left corner of the image in full-size image coordinate after flipping and rotation. Note that the position in integer means center of the pixel. P_POS[LL,UR][X,Y] must be larger than or equal to 1.

5.15.3 Example(s)

- 1

5.16 P_POSLLY

5.16.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: integer
- comment: y-pos of lower-left corner pixel of image
- level: any
- pds3: (None)
- unit: (None)

5.16.2 Definition

The value field shall contain a positive integer that gives y-position at the lower-left corner of the image in full-size image coordinate after flipping and rotation. Note that the position in integer means center of the pixel. P_POS[LL,UR][X,Y] must be larger than or equal to 1.

5.16.3 Example(s)

- 1

5.17 P_POSURX

5.17.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: integer
- comment: x-pos of upper-right corner pixel of image
- level: any
- pds3: (None)
- unit: (None)

5.17.2 Definition

The value field shall contain a positive integer that gives x-position at the upper-right corner of the image in full-size image coordinate after flipping and rotation. Note that the position in integer means center of the pixel. P_POS[LL,UR][X,Y] must be larger than or equal to 1.

5.17.3 Example(s)

- 1

5.18 P_POSURY

5.18.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: integer
- comment: y-pos of upper-right corner pixel of image
- level: any
- pds3: (None)
- unit: (None)

5.18.2 Definition

The value field shall contain a positive integer that gives y-position at the upper-right corner of the image in full-size image coordinate after flipping and rotation. Note that the position in integer means center of the pixel. P_POS[LL,UR][X,Y] must be larger than or equal to 1.

5.18.3 Example(s)

- 1

5.19 P_FLPROT

5.19.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: integer
- comment: flip and rotation flag
- level: any
- pds3: (None)
- unit: (None)

5.19.2 Definition

The value field shall contain a non-negative integer that gives the flag that represents how flip and rotation have been done. The image taken by VCO spacecraft is flipped and then rotated to be spacecraft +Y-axis upward. The value 0 means no flip and no rotation, the value 10 means flip vertically and no rotation and the value 3 means no flip and rotate 270 degree counter-clockwise.

5.19.3 Example(s)

- 0
- 3
- 10

5.20 P_OPOSX1

5.20.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: integer
- comment: selected image area in detector pixel coord.
- level: any
- pds3: (None)
- unit: (None)

5.20.2 Definition

The value field shall contain a positive integer that gives position at the four corners in detector pixel coordinate for [X,Y]-axis. Note that the position in integer means center of the pixel. P_OPOS[X,Y][1,2,3,4] must be larger than or equal to 1. P_OPOS[X,Y]1 means left-bottom position, P_OPOS[X,Y]2 means right-bottom position, P_OPOS[X,Y]3 means left-top position and P_OPOS[X,Y]4 means right-top position.

5.20.3 Example(s)

- 1

5.21 P_OPOSY1

5.21.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: integer
- comment:
- level: any
- pds3: (None)
- unit: (None)

5.21.2 Definition

Please refer to definition in P_OPOSX1 keyword.

5.21.3 Example(s)

- 1

5.22 P_OPOSX2

5.22.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: integer
- comment:
- level: any
- pds3: (None)
- unit: (None)

5.22.2 Definition

Please refer to definition in P_OPOSX1 keyword.

5.22.3 Example(s)

- 1024

5.23 P_OPOSY2

5.23.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: integer
- comment:

- level: any
- pds3: (None)
- unit: (None)

5.23.2 Definition

Please refer to definition in P_OPOSX1 keyword.

5.23.3 Example(s)

- 1

5.24 P_OPOSX3

5.24.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: integer
- comment:
- level: any
- pds3: (None)
- unit: (None)

5.24.2 Definition

Please refer to definition in P_OPOSX1 keyword.

5.24.3 Example(s)

- 1

5.25 P_OPOSY3

5.25.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: integer
- comment:
- level: any
- pds3: (None)
- unit: (None)

5.25.2 Definition

Please refer to definition in P_OPOSX1 keyword.

5.25.3 Example(s)

- 1024

5.26 P_OPOSX4

5.26.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: integer
- comment:
- level: any
- pds3: (None)
- unit: (None)

5.26.2 Definition

Please refer to definition in P_OPOSX1 keyword.

5.26.3 Example(s)

- 1024

5.27 P_OPOSY4

5.27.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: integer
- comment:
- level: any
- pds3: (None)
- unit: (None)

5.27.2 Definition

Please refer to definition in P_OPOSX1 keyword.

5.27.3 Example(s)

- 1024

5.28 P_CMPSTY

5.28.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: image compression style: RAWDATA/LOSSLESS/LOSSY
- level: any
- pds3: (None)
- unit: (None)

5.28.2 Definition

The value field shall contain a character string identifying the type of image compression on the onboard computer of the spacecraft. The value is 'RAWDATA' if no compression is applied, and the value is 'LOSSLESS' if lossless compression algorithm is applied, and the value is 'LOSSY' if lossy compression algorithm is applied.

5.28.3 Example(s)

- 'RAWDATA'
- 'LOSSLESS'
- 'LOSSY'

5.29 P_CMPTYP

5.29.1 Attributes

- lastupdate: 2020-11-14
- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: image compression type: RAWDATA/HIREW
- level: any
- pds3: (None)
- unit: (None)

5.29.2 Definition

The value field shall contain a character string identifying the algorithm of image compression. The value is 'RAWDATA' if no compression algorithm applied, and the value 'HIREW' if the HIREW compression algorithm is applied. See Takada+2007, https://doi.org/10.1109/IGARSS.2007.4422835 for the HIREW algorithm. Note that the HIREW algorithm is currently known as StarPixel Lossless.

5.29.3 Example(s)

- 'RAWDATA'
- 'HIREW'

5.30 P_CMPPAR

5.30.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: image compression parameter
- level: any
- pds3: (None)
- unit: (None)

5.30.2 Definition

The value field shall contain a character string of hexadecimal value that gives the value of 'rlevel' if the value of P_CMPTYP is 'HIREW'. A value 2^rlevel is equal to "Initial Subsampling Interval" in Takada, et al. (2007). The value of rlevel should be within the range from 0x00 to 0x08. See the reference in detail.

5.30.3 Example(s)

- '0x04'

5.31 P_IMGERR

5.31.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: image processing err log: NORMAL END/err info
- level: any
- pds3: (None)
- unit: (None)

5.31.2 Definition

The value field shall contain a character string indicating whether there is no calculation error or what kind of calculation error occurred at the processing of the images on the VCO spacecraft onboard computer. The value 'NORMAL END' means there is no error. The value 'PARAMETER ERR' means that an invalid parameter is specified as the argument of the command. The value of 'BUFFER SIZE ERR' means that an invalid buffer size is specified as the argument of the command. The value 'DR WRITE FAIL/IMAGE SIZE ERR' means failure of the writing image to DR (data recorder) because some area cannot be overridden by the other command or an invalid image size is specified. The value 'DR WRITE FAIL' means failure of the writing image to DR because there is no specified partition as the argument of the command (partition means some specific place in the memory space). The value 'OVERFLOW' means that overflow has occurred during the calculation. The value 'UNDERFLOW' means that underflow has occurred during the calculation. The value 'ZERO DIVISION' means that zero division has occurred during the calculation. The value 'OPERATION INTERRUPTION' means that operation was interrupted by some reason. TBD (Is this definition correct?)

5.31.3 Example(s)

- 'NORMAL END'
- 'PARAMETER ERR'
- 'BUFFER SIZE ERR'
- 'DR WRITE FAIL/IMAGE SIZE ERR'
- 'DR WRITE FAIL'
- 'OVERFLOW'
- 'UNDERFLOW'
- 'OVERFLOW/UNDERFLOW'
- 'ZERO DIVISION'
- 'OPERATION INTERRUPTION'

5.32 P_SCCSC

5.32.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: VCO S/C clock start count
- level: any
- pds3: SPACECRAFT_CLOCK_START_COUNT
- unit: (None)

5.32.2 Definition

The value field shall contain a character string that gives VCO spacecraft clock count value in SPICE SCLK format string at the beginning of the observation.

5.32.3 Example(s)

- '1/0559387629'

5.33 P_SCCEC

5.33.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: VCO S/C clock end count
- level: any
- pds3: SPACECRAFT_CLOCK_STOP_COUNT
- unit: (None)

5.33.2 Definition

The value field shall contain a character string that gives VCO spacecraft clock count value in SPICE SCLK format string at the end of the observation.

5.33.3 Example(s)

- '1/0559387680'

5.34 P_DPIXV

5.34.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real, integer
- comment: dead pixel flag value in data array
- level: any
- pds3: UNKNOWN_CONSTANT
- unit: (None)

5.34.2 Definition

The value field shall contain a floating-point number or an integer that gives dead pixel flag value in data array.

5.34.3 Example(s)

- 0
- -32768

5.35 P_DPIXN

5.35.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: integer
- comment: number of dead pixels in data array
- level: any
- pds3: (None)
- unit: (None)

5.35.2 Definition

The value field shall contain a non-negative integer that gives number of the dead pixel flag values in data array.

5.35.3 Example(s)

- 4

5.36 P_SPIXV

5.36.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real, integer, string
- comment: saturated pixel flag value in data array
- level: any
- pds3: INVALID_CONSTANT
- unit: (None)

5.36.2 Definition

The value field shall contain a floating-point number or an integer that gives saturated pixel flag value in data array.

5.36.3 Example(s)

- 32767
- 'N/A'

5.37 P_SPIXO

5.37.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real, integer, string
- comment: saturated pixel offset value in data array
- level: any
- pds3: (None)
- unit: (None)

5.37.2 Definition

The value field shall contain a floating-point number or an integer that gives offset value for saturated pixels in data array. Subtracting this value may revert the process.

5.37.3 Example(s)

- 100.0
- 'N/A'

5.38 P_SPIXN

5.38.1 Attributes

- status: approved

- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: integer
- comment: number of saturated pixels in data array
- level: any
- pds3: (None)
- unit: (None)

5.38.2 Definition

The value field shall contain a non-negative integer that gives number of the saturated pixel flag values in data array.

5.38.3 Example(s)

- 20

5.39 P_MPIXV

5.39.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real, integer
- comment: pixel flag value for missing data in data array
- level: any
- pds3: MISSING_CONSTANT
- unit: (None)

5.39.2 Definition

The value field shall contain a floating-point number or an integer that gives pixel flag value for missing data in data array.

5.39.3 Example(s)

- 0
- -32767

5.40 P_MPIXN

5.40.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: integer
- comment: number of pixels with missing value
- level: any
- pds3: (None)

- unit: (None)

5.40.2 Definition

The value field shall contain a non-negative integer that gives number of pixels with missing value in data array.

5.40.3 Example(s)

- 16384

5.41 P_FLTCW

5.41.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: center wavelength for the value of FILTER [um]
- level: any
- pds3: CENTER_FILTER_WAVELENGTH
- unit: micrometer

5.41.2 Definition

The value field shall contain a non-negative floating-point number that gives the center of filter passband in micrometers for the value of FILTER.

5.41.3 Example(s)

- 2.26

5.42 P_FLTBW

5.42.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: bandwidth for the value of FILTER [um]
- level: any
- pds3: BANDWIDTH
- unit: micrometer

5.42.2 Definition

The value field shall contain a non-negative floating-point number that gives the bandwidth in micrometers for the value of FILTER.

5.42.3 Example(s)

- 0.058

5.43 P_FLTAT

5.43.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: average transmission for the value of FILTER
- level: any
- pds3: VCO:FILTER_MEAN_TRANSMISSION
- unit: (None)

5.43.2 Definition

The value field shall contain a non-negative floating-point number that gives average transmission for the value of FILTER.

5.43.3 Example(s)

- 0.6

5.44 P_NSALV

5.44.1 Attributes

- lastupdate: 2018-06-12
- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: integer
- comment: number of salvaged areas
- level: any
- pds3: (None)
- unit: (None)

5.44.2 Definition

The value field shall contain a non-negative integer that gives the number of salvaged areas. The salvaged area is created by decompression of corrupted tile data. Even if the tile data is corrupted, some of the pixels have uncorrupted value due to the characteristics of the data compression algorithm, HIREW. By diagnostic message of the decompression command or by human inspection, some pixel values in the uncompressed corrupted tile data are identified as wrong values and are filled with the missing value, and some of the pixels are left as is. This keyword and P_SALVn keywords indicate all of the salvaged areas included in the image data and warn users that these areas may contain wrong values.

5.44.3 Example(s)

- 0
- 1
- 2
- 3
- 4

5.45 P_SALVn

5.45.1 Attributes

- lastupdate: 2018-06-12
- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: salvaged area that may contain wrong values
- level: any
- pds3: (None)
- unit: (None)

5.45.2 Definition

The value field shall contain a character string that gives the x- and y-ranges of the salvaged areas. The format of the string is '[x0,x1]x[y0,y1]' where x0, x1, y0, and y1 are positive integers. These four integers indicate the ranges of the salvaged area along x- and y-axis in the sub-image coordinate. The salvaged area ranges within [x0,x1] in x-axis and [y0,y1] in y-axis in the image coordinate. This area corresponds to one corrupted, salvaged tile data and the ranges of the area are recorded in each P_SALVn keyword. The total number of salvaged areas N is recorded in P_NSALV keyword. The "n" in the keyword is a non-negative integer that ranges from 0 to N-1. For the details of the salvaged area, see description of P_NSALV keyword.

5.45.3 Example(s)

- '[1,128]x[257,384]'
- '[897,1024]x[641,768]'

5.46 P_STGUES

5.46.1 Attributes

- lastupdate: 2019-11-12
- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: inst's status are acquired normally or guessed
- level: any
- pds3: (None)
- unit: (None)

5.46.2 Definition

The value field shall contain a character string that gives whether instrument-specific ancillary data for image in level 0 is guessed or not. This ancillary data include temperatures of detector, shutter, etc., that are used to process image after level 1. If value of this keyword is 'NORMAL', ancillary data is normally downlinked and used, and if value is 'GUESSED', ancillary data is not downlinked and guessed ancillary data is used.

5.46.3 Example(s)

- 'NORMAL'
- 'GUESSED'

5.47 P_DVER

5.47.1 Attributes

- lastupdate: 2019-11-12
- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: version of common keyword dictionary for VCO
- level: any
- pds3: (None)
- unit: (None)

5.47.2 Definition

The value field shall contain a character string that gives the version string of common FITS header keyword dictionary of VCO data.

5.47.3 Example(s)

- '2016-08-30'
- '2018-06-12'
- '2019-11-12'

5.48 S_ORBITN

5.48.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: integer
- comment: VCO orbit number
- level: any
- pds3: ORBIT_NUMBER
- unit: (None)

5.48.2 Definition

The value field shall contain a non-negative integer that gives the orbit number when the image was acquired by the spacecraft. The value 0 means the cruise phase.

5.48.3 Example(s)

- 0
- 21

5.49 S_PERTIM

5.49.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: time of periapsis passage
- level: any
- pds3: PERIAPSIS_TIME
- unit: date

5.49.2 Definition

The value field shall contain a string that gives the time at the periapsis passage for the orbit number with the value of S_ORBITN. The format of the string is same as DATE keyword.

5.49.3 Example(s)

- '2016-04-15T03:12:12.000'
- 'N/A'

5.50 S_PERLON

5.50.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real, string
- comment: sub S/C longitude at periapsis passage [deg]
- level: any
- pds3: PERIAPSIS_LONGITUDE
- unit: deg

5.50.2 Definition

The value field shall contain a floating-point number that gives sub spacecraft longitude at the periapsis passage for the orbit number with the value of S_ORBITN in degrees.

5.50.3 Example(s)

- 308.41
- 'N/A'

5.51 S_PERLAT

5.51.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real, string
- comment: sub S/C latitude at periapsis passage [deg]
- level: any
- pds3: PERIAPSIS_LATITUDE
- unit: deg

5.51.2 Definition

The value field shall contain a floating-point number that gives sub spacecraft latitude at the periapsis passage for the orbit number with the value of S_ORBITN in degrees.

5.51.3 Example(s)

- 80.74
- 'N/A'

5.52 S_PERALT

5.52.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real, string
- comment: sub S/C altitude at periapsis passage [km]
- level: any
- pds3: PERIAPSIS_ALTITUDE
- unit: km

5.52.2 Definition

The value field shall contain a positive floating-point number that gives sub spacecraft altitude at the periapsis passage for the orbit number with the value of S_ORBITN in kilometers.

5.52.3 Example(s)

- 260.18
- 'N/A'

5.53 S_INCANG

5.53.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real, string
- comment: inclination angle of the orbit [deg]
- level: any
- pds3: ORBITAL_INCLINATION
- unit: deg

5.53.2 Definition

The value field shall contain a floating-point number that gives the inclination angle of the orbit of VCO spacecraft in kilometers. This value is at the periapsis time of the orbit number with the value of S_ORBITN.

5.53.3 Example(s)

- 89.98
- 'N/A'

5.54 S_ECCENT

5.54.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real, string
- comment: eccentricity of the orbit
- level: any
- pds3: VCO:ORBITAL_ECCENTRICITY
- unit: (None)

5.54.2 Definition

The value field shall contain a non-negative floating-point number that gives the eccentricity of the orbit of VCO spacecraft. This value is at the periapsis time of the orbit number with the value of S_ORBITN.

5.54.3 Example(s)

- 0.84
- 'N/A'

5.55 S_LONNOD

5.55.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real, string
- comment: orbit plane longitude of ascending node [deg]
- level: any
- pds3: ASCENDING_NODE_LONGITUDE
- unit: deg

5.55.2 Definition

The value field shall contain a floating-point number that gives the longitude of the ascending node of the orbital plane of VCO spacecraft in degrees. This value is at the periapsis time of the orbit number with the value of S_ORBITN.

5.55.3 Example(s)

- 107.05
- 'N/A'

5.56 S_ARGPER

5.56.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real, string
- comment: orbit plane argument of periapsis [deg]
- level: any
- pds3: PERIAPSIS_ARGUMENT_ANGLE
- unit: deg

5.56.2 Definition

The value field shall contain a floating-point number that gives the argument of periapsis of the orbital plane of VCO spacecraft in degrees. This value is at the periapsis time of the orbit number with the value of S_ORBITN.

5.56.3 Example(s)

- 99.26
- 'N/A'

5.57 S_SEMIAX

5.57.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real, string
- comment: semi-major axis of the orbit [km]
- level: any
- pds3: ORBITAL_SEMIMAJOR_AXIS
- unit: km

5.57.2 Definition

The value field shall contain a positive floating-point number that gives the semi-major axis of the orbit of VCO spacecraft in kilometers. This value is at the time of the periapsis passage for the orbit number with the value of S_ORBITN.

5.57.3 Example(s)

- 39445.4
- 'N/A'

5.58 S_DISTAV

5.58.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: distance between VCO and Venus [km]
- level: any
- pds3: CENTRAL_BODY_DISTANCE
- unit: km

5.58.2 Definition

The value field shall contain a positive floating-point number that gives the distance between center of the VCO spacecraft and center of the Venus in kilometers.

5.58.3 Example(s)

- 72564.0733386696

5.59 S_DISTVS

5.59.1 Attributes

- status: approved

- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: distance between Venus and Sun [km]
- level: any
- pds3: TARGET_HELIOCENTRIC_DISTANCE
- unit: km

5.59.2 Definition

The value field shall contain a positive floating-point number that gives the distance between center of the Venus and center of the Sun in kilometers.

5.59.3 Example(s)

- '1.07577D+08'

5.60 S_APPDIA

5.60.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: apparent diameter of Venus [deg]
- level: any
- pds3: (None)
- unit: (None)

5.60.2 Definition

The value field shall contain a non-negative floating-point number that gives apparent diameter of Venus in degrees. The formula to calculate value of S_APPDIA is: S_APPDIA = $2asin((d+a)/r)$180/PI where d is the diameter of the Venus in kilometer, a is an assumed cloud altitude in kilometer that is stored in the S_CLDALT keyword, and r is distance between the spacecraft position and center of Venus that is stored in the S_DISTAV keyword.

5.60.3 Example(s)

- 27.1528

5.61 S_IFOV

5.61.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: instantaneous field of view [rad]

- level: any
- pds3: HORIZONTAL_PIXEL_FOV, VERTICAL_PIXEL_FOV
- unit: rad

5.61.2 Definition

The value field shall contain a positive floating-point number that gives instantaneous field of view in radians for each pixel. This value is brought from SPICE Instrument Kernel (IK). In SPICE IK, there are INS#_IFOV keywords where # means NAIF ID code for an instrument. The value of S_IFOV comes from the value of INS#_IFOV as is.

5.61.3 Example(s)

- 0.000692601

5.62 S_NPVAZM

5.62.1 Attributes

- lastupdate: 2018-10-15
- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: azimuth of north pole vector [deg]
- level: any
- pds3: (None)
- unit: (None)

5.62.2 Definition

The value field shall contain a floating-point number that gives the azimuth of north pole vector in degrees. This value of angle is measured clockwise from horizontal line that originates from center of Venus to left. This value should be within [-180, 180].

5.62.3 Example(s)

- -27.3586058819945

5.63 S_SOLLAT

5.63.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: sub solar latitude [deg]
- level: any
- pds3: SUB_SOLAR_LATITUDE
- unit: deg

5.63.2 Definition

The value field shall contain a floating-point number that gives the sub solar latitude in degrees. This value is calculated with light time correction and stellar aberration correction.

5.63.3 Example(s)

- 2.52742242650886

5.64 S_SOLLON

5.64.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: sub solar longitude [deg]
- level: any
- pds3: SUB_SOLAR_LONGITUDE
- unit: deg

5.64.2 Definition

The value field shall contain a floating-point number which gives the sub solar longitude in degrees. This value is calculated with light time correction and stellar aberration correction.

5.64.3 Example(s)

- 149.366791650151

5.65 S_TGRADI

5.65.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: target radius at sub S/C point [km]
- level: any
- pds3: VCO:SPHERICAL_RADIUS
- unit: km

5.65.2 Definition

The value field shall contain a positive floating-point number that gives the radius of the target planet at the sub spacecraft point in kilometers.

5.65.3 Example(s)

- 6051.8

5.66 S_SSCLAT

5.66.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: VCO sub S/C latitude [deg]
- level: any
- pds3: SUB_SPACECRAFT_LATITUDE
- unit: deg

5.66.2 Definition

The value field shall contain a floating-point number that gives the sub spacecraft latitude in degrees.

5.66.3 Example(s)

- -80.2726906927473

5.67 S_SSCLON

5.67.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: VCO sub S/C longitude [deg]
- level: any
- pds3: SUB_SPACECRAFT_LONGITUDE
- unit: deg

5.67.2 Definition

The value field shall contain a floating-point number that gives the sub spacecraft longitude in degrees.

5.67.3 Example(s)

- 127.691117787366

5.68 S_SSCLT

5.68.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: VCO sub S/C local Time [h]
- level: any
- pds3: LOCAL_HOUR_ANGLE
- unit: hour

5.68.2 Definition

The value field shall contain a floating-point number that gives the sub spacecraft local time in hours.

5.68.3 Example(s)

- 13.4450449241856

5.69 S_SSCPX

5.69.1 Attributes

- lastupdate: 2017-10-11
- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: sub S/C X position of image array [pix]
- level: any
- pds3: SUB_SPACECRAFT_LINE_SAMPLE
- unit: (None)

5.69.2 Definition

The value field shall contain a positive floating-point number that gives the sub spacecraft X-position of image array in image coordinate, that is not always same as full-size image coordinate but the image area is sub region of the full-size image.

5.69.3 Example(s)

- 536.692410685141

5.70 S_SSCPY

5.70.1 Attributes

- lastupdate: 2017-10-11
- status: approved

- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: sub S/C Y position on image array [pix]
- level: any
- pds3: SUB_SPACECRAFT_LINE
- unit: (None)

5.70.2 Definition

The value field shall contain a positive floating-point number that gives the sub spacecraft Y-position of image array in image coordinate, that is not always same as full-size image coordinate but the image area is sub region of the full-size image.

5.70.3 Example(s)

- 553.829841544988

5.71 S_CLDALT

5.71.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real, string
- comment: assumed cloud altitude [km]
- level: any
- pds3: VCO:ASSUMED_CLOUD_ALTITUDE
- unit: km

5.71.2 Definition

The value field shall contain a positive floating-point number that gives assumed cloud altitude of the image. This value depends on cameras and filters.

5.71.3 Example(s)

- 65.0
- 70.0
- 'N/A'

5.72 S_SCPJ2X

5.72.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: S/C X position from the Sun in J2000 [km]

- level: any
- pds3: VCO:SC_SUN_POSITION_VECTOR
- unit: km

5.72.2 Definition

The value field shall contain a floating-point number that gives spacecraft x-position in kilometers from the Sun in J2000 coordinates. This value is calculated without light time correction or stellar aberration.

5.72.3 Example(s)

- '-2.09494D+07'

5.73 S_SCPJ2Y

5.73.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: S/C Y position from the Sun in J2000 [km]
- level: any
- pds3: VCO:SC_SUN_POSITION_VECTOR
- unit: km

5.73.2 Definition

The value field shall contain a floating-point number that gives spacecraft y-position in kilometers from the Sun in J2000 coordinates. This value is calculated without light time correction or stellar aberration.

5.73.3 Example(s)

- '1.06028D+08'

5.74 S_SCPJ2Z

5.74.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: S/C Z position from the Sun in J2000 [km]
- level: any
- pds3: VCO:SC_SUN_POSITION_VECTOR
- unit: km

5.74.2 Definition

The value field shall contain a floating-point number that gives spacecraft z-position in kilometers from the Sun in J2000 coordinates. This value is calculated without light time correction or stellar aberration.

5.74.3 Example(s)

- '2.66956D+06'

5.75 S_RA

5.75.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: RA of image center (J2000) [deg]
- level: any
- pds3: RIGHT_ASCENSION
- unit: deg

5.75.2 Definition

The value field shall contain a floating-point number that gives right ascension of the center of the image in degrees, in J2000 frame.

5.75.3 Example(s)

- 17.8482

5.76 S_DEC

5.76.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: DEC of image center (J2000) [deg]
- level: any
- pds3: DECLINATION
- unit: deg

5.76.2 Definition

The value field shall contain a floating-point number that gives declination of the center of the image in degrees, in J2000 frame.

5.76.3 Example(s)

- 18.1983

5.77 S_RA1

5.77.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: RA of bottom-left corner of image [deg]
- level: any
- pds3: (None)
- unit: (None)

5.77.2 Definition

The value field shall contain a floating-point number that gives right ascension of the bottom-left corner of the image in degrees, in J2000 frame.

5.77.3 Example(s)

- 24.3677

5.78 S_DEC1

5.78.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: DEC of bottom-left corner of image [deg]
- level: any
- pds3: (None)
- unit: (None)

5.78.2 Definition

The value field shall contain a floating-point number that gives declination of the bottom-left corner of the image in degrees, in J2000 frame.

5.78.3 Example(s)

- 18.1983

5.79 S_RA2

5.79.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: RA of bottom-right corner of image [deg]
- level: any
- pds3: (None)
- unit: (None)

5.79.2 Definition

The value field shall contain a floating-point number that gives right ascension of the bottom-right corner of the image in degrees, in J2000 frame.

5.79.3 Example(s)

- 11.8331

5.80 S_DEC2

5.80.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: DEC of bottom-right corner of image [deg]
- level: any
- pds3: (None)
- unit: (None)

5.80.2 Definition

The value field shall contain a floating-point number that gives declination of the bottom-right corner of the image in degrees, in J2000 frame.

5.80.3 Example(s)

- 17.7543

5.81 S_RA3

5.81.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image

- datatype: real
- comment: RA of top-left corner of image [deg]
- level: any
- pds3: (None)
- unit: (None)

5.81.2 Definition

The value field shall contain a floating-point number that gives right ascension of the top-left corner of the image in degrees, in J2000 frame.

5.81.3 Example(s)

- 24.4734

5.82 S_DEC3

5.82.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: DEC of top-left corner of image [deg]
- level: any
- pds3: (None)
- unit: (None)

5.82.2 Definition

The value field shall contain a floating-point number that gives declination of the top-left corner of the image in degrees, in J2000 frame.

5.82.3 Example(s)

- 30.1261

5.83 S_RA4

5.83.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: RA of top-right corner of image [deg]
- level: any
- pds3: (None)
- unit: (None)

5.83.2 Definition

The value field shall contain a floating-point number that gives right ascension of the top-right corner of the image in degrees, in J2000 frame.

5.83.3 Example(s)

- 10.7193

5.84 S_DEC4

5.84.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: DEC of top-right corner of image [deg]
- level: any
- pds3: (None)
- unit: (None)

5.84.2 Definition

The value field shall contain a floating-point number that gives declination of the top-right corner of the image in degrees, in J2000 frame.

5.84.3 Example(s)

- 29.6396

5.85 S_SDIRX

5.85.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: X of unit vector of Sun direction in S/C frame
- level: any
- pds3: (None)
- unit: (None)

5.85.2 Definition

The value field shall contain a floating-point number that gives X-component of the unit vector of the Sun direction from spacecraft in spacecraft frame. This value is calculated with light time correction and stellar aberration correction.

5.85.3 Example(s)

- 0.7

5.86 S_SDIRY

5.86.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: Y of unit vector of Sun direction in S/C frame
- level: any
- pds3: (None)
- unit: (None)

5.86.2 Definition

The value field shall contain a floating-point number that gives Y-component of the unit vector of the Sun direction from spacecraft in spacecraft frame. This value is calculated with light time correction and stellar aberration correction.

5.86.3 Example(s)

- 0.5

5.87 S_SDIRZ

5.87.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: Z of unit vector of Sun direction in S/C frame
- level: any
- pds3: (None)
- unit: (None)

5.87.2 Definition

The value field shall contain a floating-point number that gives Z-component of the unit vector of the Sun direction from spacecraft in spacecraft frame. This value is calculated with light time correction and stellar aberration correction.

5.87.3 Example(s)

- 0.1

5.88 S_Q0SPC

5.88.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: scalar part of the quaternion of S/C attitude
- level: any
- pds3: QUATERNION
- unit: (None)

5.88.2 Definition

The value field shall contain a floating-point number that gives scalar part of the quaternion of spacecraft attitude in J2000 coordinate system.

5.88.3 Example(s)

- 0.2541027

5.89 S_Q1SPC

5.89.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: 1st element of vector part of the quaternion
- level: any
- pds3: QUATERNION
- unit: (None)

5.89.2 Definition

The value field shall contain a floating-point number that gives 1st element of vector part of the quaternion of spacecraft attitude in J2000 coordinate system.

5.89.3 Example(s)

- 0.1572342

5.90 S_Q2SPC

5.90.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image

- datatype: real
- comment: 2nd element of vector part of the quaternion
- level: any
- pds3: QUATERNION
- unit: (None)

5.90.2 Definition

The value field shall contain a floating-point number that gives 2nd element of vector part of the quaternion of spacecraft attitude in J2000 coordinate system.

5.90.3 Example(s)

- 0.2317543

5.91 S_Q3SPC

5.91.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: 3rd element of vector part of the quaternion
- level: any
- pds3: QUATERNION
- unit: (None)

5.91.2 Definition

The value field shall contain a floating-point number that gives 3rd element of vector part of the quaternion of spacecraft attitude in J2000 coordinate system.

5.91.3 Example(s)

- -0.8186434

5.92 S_SSCPHA

5.92.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real, string
- comment: VCO sub S/C phase angle [deg]
- level: any
- pds3: VCO:SUB_SC_PHASE_ANGLE
- unit: deg

5.92.2 Definition

The value field shall contain a floating-point number that gives phase angle at sub spacecraft point.

5.92.3 Example(s)

- 85.2845
- 'N/A'

6 VCO UVI-specific Keywords

6.1 UV_OBAR

6.1.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: UVI CCD area: NORMAL/TOP_OB/LEFT_OB/RIGHT_OB
- level: any
- pds3: (None)
- unit: (None)

6.1.2 Definition

The value field shall contain a character string that gives type of UVI CCD area. The value 'NORMAL' means that the imaging mode is normal, i.e., 1024x1024 photosensitive area are stored in DR (data recorder) then image is cropped if ROI (region of interest) function is used. The values 'TOP_OB', 'LEFT_OB', and 'RIGHT_OB' mean that the imaging mode that enable us to get OB (optical black) area by shifting the target area of image keeping size of image same. The OB areas are used to get dark noise or smear counts. The value 'TOP_OB' means that the stored image region is shifted to top-side direction, the value 'LEFT_OB' means that the stored image region is shifted to left-side direction, and the value 'RIGHT_OB' means that the stored image region is shifted to right-side direction. Please see the 'Detector Layout' section of SPICE IK (instrument kernel) for UVI in further detail.

6.1.3 Example(s)

- 'NORMAL'
- 'TOP_OB'
- 'LEFT_OB'
- 'RIGHT_OB'

6.2 UV_CCDT

6.2.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real

- comment: UVI CCD temperature [deg C]
- level: any
- pds3: INSTRUMENT_TEMPERATURE_POINT, UVI CCD
- unit: degC

6.2.2 Definition

The value field shall contain a floating-point number that gives the temperature of the UVI CCD in degrees Celsius.

6.2.3 Example(s)

- -41.58

6.3 UV_FILT

6.3.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: UVI filter temperature [deg C]
- level: any
- pds3: INSTRUMENT_TEMPERATURE_POINT, UVI filter
- unit: degC

6.3.2 Definition

The value field shall contain a floating-point number that gives the temperature of the UVI filter in degrees Celsius.

6.3.3 Example(s)

- -13.99

6.4 UV_05V

6.4.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: UVI PS 5V monitor [V]
- level: any
- pds3: (None)
- unit: (None)

6.4.2 Definition

The value field shall contain a floating-point number that gives the voltage of 5 V PS (power supply) monitor in volts for the UVI electric device.

6.4.3 Example(s)

- 4.93

6.5 UV_15V

6.5.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: UVI PS 15V monitor [V]
- level: any
- pds3: (None)
- unit: (None)

6.5.2 Definition

The value field shall contain a floating-point number that gives the voltage of 15 V PS (power supply) monitor in volts for the UVI electric device.

6.5.3 Example(s)

- 14.69

6.6 UV_30V

6.6.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: UVI PS 30V monitor [V]
- level: any
- pds3: (None)
- unit: (None)

6.6.2 Definition

The value field shall contain a floating-point number that gives the voltage of 30 V PS (power supply) monitor in volts for the UVI electric device.

6.6.3 Example(s)

- 29.47

6.7 UV_FLAT

6.7.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: filename of flat-field image
- level: L2
- pds3: (None)
- unit: (None)

6.7.2 Definition

The value field shall contain a character string that gives filename of the flat-field image that is used to calibrate.

6.7.3 Example(s)

- 'vcouvi_nmrob_283_flat_20160813.fit'
- 'vcouvi_nmrob_365_flat_20160813.fit'
- 'vcouvi_topob_283_flat_20160813.fit'
- 'vcouvi_topob_365_flat_20160813.fit'

6.8 UV_C2F

6.8.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: method for converting pixel counts to flux
- level: L2
- pds3: (None)
- unit: (None)

6.8.2 Definition

The value field shall contain a character string that gives the method for converting pixel counts to flux.

6.8.3 Example(s)

- 'Flux [W/m2/sr/m] = (Counts * K1 + K0) / Exposure'

6.9 UV_C2FK1

6.9.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: K1 in the value of UV_C2F
- level: L2
- pds3: (None)
- unit: (None)

6.9.2 Definition

The value field shall contain a floating-point number that gives the value K1 in the value of UV_C2F.

6.9.3 Example(s)

- 9227.22

6.10 UV_C2FK0

6.10.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: K0 in the value of UV_C2F
- level: L2
- pds3: (None)
- unit: (None)

6.10.2 Definition

The value field shall contain a floating-point number that gives the value K0 in the value of UV_C2F.

6.10.3 Example(s)

- 0.0

6.11 UV_C2E

6.11.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: number of electrons per count

- level: any
- pds3: (None)
- unit: (None)

6.11.2 Definition

The value field shall contain a non-negative floating-point number that gives number of electrons per count for the detector.

6.11.3 Example(s)

- 29.3

6.12 UV_FSNR

6.12.1 Attributes

- status: proposed
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: S/N ratio of the flat used to calibrate
- level: L2
- pds3: (None)
- unit: (None)

6.12.2 Definition

The value field shall contain a non-negative floating-point number that gives signal to noise ratio of the flat used to calibrate image.

6.12.3 Example(s)

- 0.4904414

6.13 UV_FPFLG

6.13.1 Attributes

- lastupdate: 2019-08-19
- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: filter wheel position flag
- level: any
- pds3: (None)
- unit: (None)

6.13.2 Definition

The value field shall contain a character string that gives filter wheel position flag. The value 'MIGHT BE GOOD' means that filter wheel position might be good and the image might not be affected by the wrong filter wheel position. The value 'MIGHT BE WRONG' means that filter wheel position might be wrong and the image might be affected by the wrong filter wheel position.

6.13.3 Example(s)

- 'MIGHT BE GOOD'
- 'MIGHT BE WRONG'

6.14 UV_DVER

6.14.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: version of keyword dictionary for UVI
- level: any
- pds3: (None)
- unit: (None)

6.14.2 Definition

The value field shall contain a character string that gives the version string of FITS header keyword dictionary of VCO data for UVI camera.

6.14.3 Example(s)

- '2016-08-24'

7 VCO IR1-specific Keywords

7.1 I1_TCON

7.1.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: IR1 TEC status: OFF/ON
- level: any
- pds3: (None)
- unit: (None)

7.1.2 Definition

The value field shall contain a character string that gives IR1 TEC (thermoelectric cooler) power status.

7.1.3 Example(s)

- 'ON'
- 'OFF'

7.2 I1_TCMOD

7.2.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: IR1 TEC heater status: COOL/HEAT
- level: any
- pds3: (None)
- unit: (None)

7.2.2 Definition

The value field shall contain a character string that gives IR1 TEC (thermoelectric cooler) heater status.

7.2.3 Example(s)

- 'COOL'
- 'HEAT'

7.3 I1_CLENA

7.3.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: IR1 CAL lamp permission: DISABLE/ENABLE
- level: any
- pds3: (None)
- unit: (None)

7.3.2 Definition

The value field shall contain a character string that gives IR1 calibration lamp permission. If the value is ENABLE and a special clock pattern is used, the internal lamp turns on for health check purpose.

7.3.3 Example(s)

- 'ENABLE'
- 'DISABLE'

7.4 I1_CLON

7.4.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: IR1 CAL lamp status: OFF/ON
- level: any
- pds3: (None)
- unit: (None)

7.4.2 Definition

The value field shall contain a character string that gives IR1 calibration lamp power status.

7.4.3 Example(s)

- 'ON'
- 'OFF'

7.5 I1_CLBRT

7.5.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: IR1 CAL lamp brightness: DARK/BRIGHT
- level: any
- pds3: (None)
- unit: (None)

7.5.2 Definition

The value field shall contain a character string that gives IR1 calibration lamp brightness.

7.5.3 Example(s)

- 'DARK'
- 'BRIGHT'

7.6 I1_LEDON

7.6.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: IR1 LED status: OFF/ON
- level: any
- pds3: (None)
- unit: (None)

7.6.2 Definition

The value field shall contain a character string that gives IR1 LED status. There are two LED-PD pairs to verify the filter-wheel position. The LEDs turn on only when the filter-wheel rotates. Therefore, this should usually be OFF in all images.

7.6.3 Example(s)

- 'ON'
- 'OFF'

7.7 I1_P1ACK

7.7.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: IR1 photodiode1 status: ACK/NO ACK
- level: any
- pds3: (None)
- unit: (None)

7.7.2 Definition

The value field shall contain a character string that gives IR1 photodiode no. 1 status. To verify the filter-wheel position, there are two LED-PD pairs for redundancy. LED light will be detected (ACKnowledged) by PD thorough a hole of wheel if a filter is in position. The value "NO ACK" indicates mis-positioned filter wheel but may usually be just a few motor pulses offset which can not be noticed from an image. Note the status remains after LEDs are turned off.

7.7.3 Example(s)

- 'ACK'
- 'NO ACK'

7.8 I1_P2ACK

7.8.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: IR1 photodiode2 status: ACK/NO ACK
- level: any
- pds3: (None)
- unit: (None)

7.8.2 Definition

The value field shall contain a character string that gives IR1 photodiode no. 2 status. To verify the filter-wheel position, there are two LED-PD pairs for redundancy. LED light will be detected (ACKnowledged) by PD thorough a hole of wheel if a filter is in position. The value "NO ACK" indicates mis-positioned filter wheel but may usually be just a few motor pulses offset which can not be noticed from an image. Note the status remains after LEDs are turned off.

7.8.3 Example(s)

- 'ACK'
- 'NO ACK'

7.9 I1_FWROT

7.9.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: IR1 filter wheel status: STOP/ROTATION
- level: any
- pds3: (None)
- unit: (None)

7.9.2 Definition

The value field shall contain a character string that gives IR1 filter wheel status. This should usually be STOP in all images.

7.9.3 Example(s)

- 'STOP'
- 'ROTATION'

7.10 I1_IMGNM

7.10.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: integer
- comment: number of processed images
- level: any
- pds3: (None)
- unit: (None)

7.10.2 Definition

The value field shall contain a positive integer that gives numer of processed images to generate the data array of the image.

7.10.3 Example(s)

- 1

7.11 I1_T_C1

7.11.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real, string
- comment: IR1 CCD temperature (230-270) [K]
- level: any
- pds3: INSTRUMENT_TEMPERATURE_POINT, IR1 CCD
- unit: K

7.11.2 Definition

The value field shall contain a non-negative floating-point number that gives IR1 CCD temperature (230-270) in Kelvin. The value of I1_T_C1 is valid when it is below 270 [K], and the value of I1_T_C2 is effective when it is above 270 [K].

7.11.3 Example(s)

- 272.08
- 'N/A'

7.12 I1_T_C2

7.12.1 Attributes

- status: approved

- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real, string
- comment: IR1 CCD temperature (270-350) [K]
- level: any
- pds3: INSTRUMENT_TEMPERATURE_POINT, IR1 CCD
- unit: K

7.12.2 Definition

The value field shall contain a non-negative floating-point number that gives IR1 CCD temperature (230-270) in Kelvin. The value of I1_T_C1 is valid when it is below 270 [K], and the value of I1_T_C2 is effective when it is above 270 [K].

7.12.3 Example(s)

- 353.5
- 'N/A'

7.13 I1_T_OP

7.13.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: IR1 optics temperature (250-320) [K]
- level: any
- pds3: INSTRUMENT_TEMPERATURE_POINT, IR1 optics
- unit: K

7.13.2 Definition

The value field shall contain a non-negative floating-point number that gives IR1 optics temperature (250-320) in Kelvin.

7.13.3 Example(s)

- 247.44

7.14 I1_T_HD

7.14.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: IR1 hood temperature (250-320) [K]
- level: any

- pds3: INSTRUMENT_TEMPERATURE_POINT, IR1 hood
- unit: K

7.14.2 Definition

The value field shall contain a non-negative floating-point number that gives IR1 hood temperature (250-320) in Kelvin.

7.14.3 Example(s)

- 239.62

7.15 I1_TECT

7.15.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: IR1 TEC temperature (230-350) [K]
- level: any
- pds3: INSTRUMENT_TEMPERATURE_POINT, IR1 thermoelectric cooler
- unit: K

7.15.2 Definition

The value field shall contain a non-negative floating-point number that gives IR1 TEC (thermoelectric cooler) temperature (230-350) in Kelvin.

7.15.3 Example(s)

- 244.16

7.16 I1_TCSET

7.16.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: IR1 TEC set value [A]
- level: any
- pds3: VCO:IR1_TEC_SET_VALUE
- unit: A

7.16.2 Definition

The value field shall contain a floating-point number that gives the set value for IR1 TEC (thermoelectric cooler) in amperes.

7.16.3 Example(s)

- 10.0

7.17 I1_CLKn

7.17.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: IR1 CLKn DAC value
- level: any
- pds3: (None)
- unit: (None)

7.17.2 Definition

The value field shall contain a character string of hexadecimal value that gives IR1 clock no. n DAC (digital to analog converter) value, where n is 01, 02, . . . , 15. These values represents various voltage setups.

7.17.3 Example(s)

- '0x00'

7.18 I1_FLAT

7.18.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: filename of flat-field image
- level: L2
- pds3: (None)
- unit: (None)

7.18.2 Definition

The value field shall contain a character string that gives filename of the flat-field image that is used to calibrate.

7.18.3 Example(s)

- 'ir1_flat_20170316.fit'

7.19 I1_C2F

7.19.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: method for converting pixel counts to flux
- level: L2
- pds3: (None)
- unit: (None)

7.19.2 Definition

The value field shall contain a character string that gives the method for converting pixel counts to flux.

7.19.3 Example(s)

- 'Flux [mW cm^-2 um^-1 sr^-1] = (Counts * K1 + K0) / Exposure'

7.20 I1_C2FK1

7.20.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: K1 for
- level: L2
- pds3: (None)
- unit: (None)

7.20.2 Definition

The value field shall contain a floating-point number that gives the value K1 in the value of I1_C2F.

7.20.3 Example(s)

- 0.0

7.21 I1_C2FK0

7.21.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: K0 for

- level: L2
- pds3: (None)
- unit: (None)

7.21.2 Definition

The value field shall contain a floating-point number that gives the value K0 in the value of I1_C2F.

7.21.3 Example(s)

- 0.0

7.22 I1_QC_X0

7.22.1 Attributes

- lastupdate: 2018-08-17
- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: inter-quad corr. b/w quad(0,0) and quad(1,0)
- level: L2
- pds3: (None)
- unit: (None)

7.22.2 Definition

The value field shall contain a character string that gives whether inter-quadrant sensitivity correction factor was used for inter-quadrant sensitivity corrections calculated by comparing the pixel values in the lower-right quadrant (named quad(1,0)) with the pixel values in the lower-left quadrant (named quad(0,0)). If the value is 'APPLIED', the ratio of quad(0,0) to quad(1,0) is used for sensitivity correction. Note that there can be calculated four sensitivity correction factors, but only three sensitivity correction factors are needed to the sensitivity correction. There are four sensitivity correction factor use status flag keywords, I1_QC_X0, I1_QC_X1, I1_QC_0X, and I1_QC_1X. At least one value of these keywords should be 'NOT APPLIED'. The sensitivity correction factor for the pixels in each quadrant will be stored in the value of I1_QCF00, I1_QCF10, I1_QCF01, and I1_QCF11 keywords.

7.22.3 Example(s)

- 'APPLIED'
- 'NOT APPLIED'

7.23 I1_QC_X1

7.23.1 Attributes

- lastupdate: 2018-08-17
- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image

- datatype: string
- comment: inter-quad corr. b/w quad(0,1) and quad(1,1)
- level: L2
- pds3: (None)
- unit: (None)

7.23.2 Definition

The value field shall contain a character string that gives whether inter-quadrant sensitivity correction factor was used for inter-quadrant sensitivity corrections calculated by comparing the pixel values in the upper-right quadrant (named quad(1,1)) with the pixel values in the upper-left quadrant (named quad(0,1)). If the value is 'APPLIED', the ratio of quad(0,1) to quad(1,1) is used for sensitivity correction. Note that there can be calculated four sensitivity correction factors, but only three sensitivity correction factors are needed to the sensitivity correction. There are four sensitivity correction factor use status flag keywords, I1_QC_X0, I1_QC_X1, I1_QC_0X, and I1_QC_1X. At least one value of these keywords should be 'NOT APPLIED'. The sensitivity correction factor for the pixels in each quadrant will be stored in the value of I1_QCF00, I1_QCF10, I1_QCF01, and I1_QCF11 keywords.

7.23.3 Example(s)

- 'APPLIED'
- 'NOT APPLIED'

7.24 I1_QC_0X

7.24.1 Attributes

- lastupdate: 2018-08-17
- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: inter-quad corr. b/w quad(0,0) and quad(0,1)
- level: L2
- pds3: (None)
- unit: (None)

7.24.2 Definition

The value field shall contain a character string that gives whether inter-quadrant sensitivity correction factor was used for inter-quadrant sensitivity corrections calculated by comparing the pixel values in the upper-left quadrant (named quad(0,1)) with the pixel values in the lower-left quadrant (named quad(0,0)). If the value is 'APPLIED', the ratio of quad(0,0) to quad(0,1) is used for sensitivity correction. Note that there can be calculated four sensitivity correction factors, but only three sensitivity correction factors are needed to the sensitivity correction. There are four sensitivity correction factor use status flag keywords, I1_QC_X0, I1_QC_X1, I1_QC_0X, and I1_QC_1X. At least one value of these keywords should be 'NOT APPLIED'. The sensitivity correction factor for the pixels in each quadrant will be stored in the value of I1_QCF00, I1_QCF10, I1_QCF01, and I1_QCF11 keywords.

7.24.3 Example(s)

- 'APPLIED'

- ‘NOT APPLIED’

7.25 I1_QC_1X

7.25.1 Attributes

- lastupdate: 2018-08-17
- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: inter-quad corr. b/w quad(1,0) and quad(1,1)
- level: L2
- pds3: (None)
- unit: (None)

7.25.2 Definition

The value field shall contain a character string that gives whether inter-quadrant sensitivity correction factor was used for inter-quadrant sensitivity corrections calculated by comparing the pixel values in the lower-right quadrant (named quad(1,0)) with the pixel values in the upper-right quadrant (named quad(1,1)). If the value is ‘APPLIED’, the ratio of quad(1,1) to quad(1,0) is used for sensitivity correction. Note that there can be calculated four sensitivity correction factors, but only three sensitivity correction factors are needed to the sensitivity correction. There are four sensitivity correction factor use status flag keywords, I1_QC_X0, I1_QC_X1, I1_QC_0X, and I1_QC_1X. At least one value of these keywords should be ‘NOT APPLIED’. The sensitivity correction factor for the pixels in each quadrant will be stored in the value of I1_QCF00, I1_QCF10, I1_QCF01, and I1_QCF11 keywords.

7.25.3 Example(s)

- ‘APPLIED’
- ‘NOT APPLIED’

7.26 I1_SCVER

7.26.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: version for smear correction factor
- level: L2
- pds3: (None)
- unit: (None)

7.26.2 Definition

The value field shall contain a character string that gives the version string of smear correction. This version string is for the value of the keywords I1_SCF00, I1_SCF10, I1_SCF01, and I1_SCF11.

7.26.3 Example(s)

- 'v0.1 (2016-10-25)'

7.27 I1_SCF00

7.27.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: smear correction factor for lower-left quad.
- level: L2
- pds3: (None)
- unit: (None)

7.27.2 Definition

The value field shall contain a floating-point number that gives the value for the smear correction factor for lower-left quadrant.

7.27.3 Example(s)

- 1.0

7.28 I1_SCF10

7.28.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: smear correction factor for lower-right quad.
- level: L2
- pds3: (None)
- unit: (None)

7.28.2 Definition

The value field shall contain a floating-point number that gives the value for the smear correction factor for lower-right quadrant.

7.28.3 Example(s)

- 1.0

7.29 I1_SCF01

7.29.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: smear correction factor for upper-left quad.
- level: L2
- pds3: (None)
- unit: (None)

7.29.2 Definition

The value field shall contain a floating-point number that gives the value for the smear correction factor for upper-left quadrant.

7.29.3 Example(s)

- 1.0

7.30 I1_SCF11

7.30.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: smear correction factor for upper-right quad.
- level: L2
- pds3: (None)
- unit: (None)

7.30.2 Definition

The value field shall contain a floating-point number that gives the value for the smear correction factor for upper-right quadrant.

7.30.3 Example(s)

- 1.0

7.31 I1_QCF00

7.31.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image

- datatype: real
- comment: inter-quad. corr. factor for lower-left quad.
- level: L2
- pds3: (None)
- unit: (None)

7.31.2 Definition

The value field shall contain a floating-point number that gives the value for inter-quadrant correction factor for lower-left quadrant. This value is calculated for each image.

7.31.3 Example(s)

- 1.0

7.32 I1_QCF10

7.32.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: inter-quad. corr. factor for lower-right quad.
- level: L2
- pds3: (None)
- unit: (None)

7.32.2 Definition

The value field shall contain a floating-point number that gives the value for inter-quadrant correction factor for lower-right quadrant. This value is calculated for each image.

7.32.3 Example(s)

- 1.0

7.33 I1_QCF01

7.33.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: inter-quad. corr. factor for upper-left quad.
- level: L2
- pds3: (None)
- unit: (None)

7.33.2 Definition

The value field shall contain a floating-point number that gives the value for inter-quadrant correction factor for upper-left quadrant. This value is calculated for each image.

7.33.3 Example(s)

- 1.0

7.34 I1_QCF11

7.34.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: inter-quad. corr. factor for upper-right quad.
- level: L2
- pds3: (None)
- unit: (None)

7.34.2 Definition

The value field shall contain a floating-point number that gives the value for inter-quadrant correction factor for upper-right quadrant. This value is calculated for each image.

7.34.3 Example(s)

- 1.0

7.35 I1_PTTRN

7.35.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: version string for IR clock-pattern program
- level: any
- pds3: (None)
- unit: (None)

7.35.2 Definition

The value field shall contain a character string that gives version string for IR clock-pattern program. The program is a compilation of clock patterns each of which drives the CCD with various exposure time, cal-lamp setting, etc.

7.35.3 Example(s)

- '2010.11.29'

7.36 I1_C2E

7.36.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: number of electrons per count
- level: any
- pds3: (None)
- unit: (None)

7.36.2 Definition

The value field shall contain a non-negative floating-point number that gives number of electrons per count for the detector.

7.36.3 Example(s)

- 70.0

7.37 I1_CMAX

7.37.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: integer
- comment: maximum valid count of data
- level: any
- pds3: (None)
- unit: (None)

7.37.2 Definition

The value field shall always contain an integer that represents the maximum valid count represented by the array.

7.37.3 Example(s)

- 10000

7.38 I1_FSNR

7.38.1 Attributes

- status: proposed
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: S/N ratio of the flat used to calibrate
- level: L2
- pds3: (None)
- unit: (None)

7.38.2 Definition

The value field shall contain a non-negative floating-point number that gives signal to noise ratio of the flat used to calibrate image.

7.38.3 Example(s)

- 0.0

7.39 I1_DVER

7.39.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: version of keyword dictionary for IR1
- level: any
- pds3: (None)
- unit: (None)

7.39.2 Definition

The value field shall contain a character string that gives the version string of FITS header keyword dictionary of VCO data for IR1 camera.

7.39.3 Example(s)

- '2016-08-24'

8 VCO IR2-specific Keywords

8.1 I2_HTON

8.1.1 Attributes

- status: approved

- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: IR2 heater status: OFF/ON
- level: any
- pds3: (None)
- unit: (None)

8.1.2 Definition

The value field shall contain a character string that gives IR2 on-chip (replacement) heater power status.

8.1.3 Example(s)

- 'ON'
- 'OFF'

8.2 I2_HTENA

8.2.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: IR2 heater permission: DISABLE/ENABLE
- level: any
- pds3: (None)
- unit: (None)

8.2.2 Definition

The value field shall contain a character string that gives IR2 on-chip heater permission. If the value is ENABLE, the on-chip heater will maintain the detector temperature during long exposures.

8.2.3 Example(s)

- 'DISABLE'
- 'ENABLE'

8.3 I2_CLENA

8.3.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: IR2 CAL lamp permission: DISABLE/ENABLE
- level: any
- pds3: (None)

- unit: (None)

8.3.2 Definition

The value field shall contain a character string that gives IR2 calibration lamp permission. If the value is ENABLE and a special clock pattern is used, the internal lamp turns on for health check purpose.

8.3.3 Example(s)

- 'DISABLE'
- 'ENABLE'

8.4 I2_CLON

8.4.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: IR2 CAL lamp status: OFF/ON
- level: any
- pds3: (None)
- unit: (None)

8.4.2 Definition

The value field shall contain a character string that gives IR2 calibration lamp power status.

8.4.3 Example(s)

- 'OFF'
- 'ON'

8.5 I2_CLBRT

8.5.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: IR2 CAL lamp brightness: DARK/BRIGHT
- level: any
- pds3: (None)
- unit: (None)

8.5.2 Definition

The value field shall contain a character string that gives IR2 calibration lamp brightness.

8.5.3 Example(s)

- 'DARK'
- 'BRIGHT'

8.6 I2_GAIN

8.6.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: IR2 amplifier gain: LOW/HIGH
- level: any
- pds3: (None)
- unit: (None)

8.6.2 Definition

The value field shall contain a character string that gives the status of IR2 amplifier gain. HIGH is 10 times the LOW gain.

8.6.3 Example(s)

- 'LOW'
- 'HIGH'

8.7 I2_LEDON

8.7.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: IR2 LED status: OFF/ON
- level: any
- pds3: (None)
- unit: (None)

8.7.2 Definition

The value field shall contain a character string that gives IR2 LED status. There are two LED-PD pairs to verify the filter-wheel position. The LEDs turn on only when the filter-wheel rotates. Therefore, this should usually be OFF in all images.

8.7.3 Example(s)

- 'OFF'
- 'ON'

8.8 I2_P1ACK

8.8.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: IR2 photodiode1 status: ACK/NO ACK
- level: any
- pds3: (None)
- unit: (None)

8.8.2 Definition

The value field shall contain a character string that gives IR2 photodiode no. 1 status. To verify the filter-wheel position, there are two LED-PD pairs for redundancy. LED light will be detected (ACKnowledged) by PD thorough a hole of wheel if a filter is in position. The value "NO ACK" indicates mis-positioned filter wheel but may usually be just a few motor pulses offset which can not be noticed from an image. Note the status remains after LEDs are turned off.

8.8.3 Example(s)

- 'ACK'
- 'NO ACK'

8.9 I2_P2ACK

8.9.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: IR2 photodiode2 status: ACK/NO ACK
- level: any
- pds3: (None)
- unit: (None)

8.9.2 Definition

The value field shall contain a character string that gives IR2 photodiode no. 2 status. To verify the filter-wheel position, there are two LED-PD pairs for redundancy. LED light will be detected (ACKnowledged) by PD thorough a hole of wheel if a filter is in position. The value "NO ACK" indicates mis-positioned filter wheel but may usually be just a few motor pulses offset which can not be noticed from an image. Note the status remains after LEDs are turned off.

8.9.3 Example(s)

- 'ACK'
- 'NO ACK'

8.10 I2_FWROT

8.10.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: IR2 filter wheel status: STOP/ROTATION
- level: any
- pds3: (None)
- unit: (None)

8.10.2 Definition

The value field shall contain a character string that gives IR2 filter wheel status. This should usually be STOP in all images.

8.10.3 Example(s)

- 'STOP'
- 'ROTATION'

8.11 I2_IMGNM

8.11.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: integer
- comment: number of processed images
- level: any
- pds3: (None)
- unit: (None)

8.11.2 Definition

The value field shall contain a positive integer that gives number of processed images to generate the data array of the image.

8.11.3 Example(s)

- 1

8.12 I2_T_C1

8.12.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary

- hdu: image
- datatype: real
- comment: IR2 CCD temperature (50-70) [K]
- level: any
- pds3: INSTRUMENT_TEMPERATURE_POINT, IR2 CCD
- unit: K

8.12.2 Definition

The value field shall contain a non-negative floating-point number that gives IR2 CCD temperature (50-70) in Kelvin. The value of I2_T_C1 is valid when it is below 70 [K], and the value of I2_T_C2 is effective when it is above 70 [K].

8.12.3 Example(s)

- 70.68

8.13 I2_T_C2

8.13.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: IR2 CCD temperature (70-350) [K]
- level: any
- pds3: INSTRUMENT_TEMPERATURE_POINT, IR2 CCD
- unit: K

8.13.2 Definition

The value field shall contain a non-negative floating-point number that gives IR2 CCD temperature (70-350) in Kelvin. The value of I2_T_C1 is valid when it is below 70 [K], and the value of I2_T_C2 is effective when it is above 70 [K].

8.13.3 Example(s)

- 270.97

8.14 I2_T_OP

8.14.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: IR2 optics temperature (150-320) [K]
- level: any
- pds3: INSTRUMENT_TEMPERATURE_POINT, IR2 optics
- unit: K

8.14.2 Definition

The value field shall contain a non-negative floating-point number that gives IR2 optics temperature (150-320) in Kelvin.

8.14.3 Example(s)

- 281.61

8.15 I2_T_CH

8.15.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: IR2 cold head temperature (200-320) [K]
- level: any
- pds3: INSTRUMENT_TEMPERATURE_POINT, IR2 cold head
- unit: K

8.15.2 Definition

The value field shall contain a non-negative floating-point number that gives IR2 cold head temperature (200-320) in Kelvin.

8.15.3 Example(s)

- 208.72

8.16 I2_T_CM

8.16.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: IR2 compressor temperature (200-320) [K]
- level: any
- pds3: INSTRUMENT_TEMPERATURE_POINT, IR2 compressor
- unit: K

8.16.2 Definition

The value field shall contain a non-negative floating-point number that gives IR2 compressor temperature (200-320) in Kelvin.

8.16.3 Example(s)

- 208.15

8.17 I2_T_HD

8.17.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: IR2 hood temperature (200-350) [K]
- level: any
- pds3: INSTRUMENT_TEMPERATURE_POINT, IR2 hood
- unit: K

8.17.2 Definition

The value field shall contain a non-negative floating-point number that gives IR2 hood temperature (200-350) in Kelvin.

8.17.3 Example(s)

- 207.8

8.18 I2_T_P1

8.18.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: IR2 cold tip temperature (45-70) [K]
- level: any
- pds3: INSTRUMENT_TEMPERATURE_POINT, IR2 cold tip
- unit: K

8.18.2 Definition

The value field shall contain a non-negative floating-point number that gives IR2 cold tip temperature (45-70) in Kelvin. The value of I2_T_P1 is valid when it is below 70 [K], and the value of I2_T_P2 is effective when it is above 70 [K].

8.18.3 Example(s)

- 72.14

8.19 I2_T_P2

8.19.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: IR2 cold tip temperature (70-350) [K]
- level: any
- pds3: INSTRUMENT_TEMPERATURE_POINT, IR2 cold tip
- unit: K

8.19.2 Definition

The value field shall contain a non-negative floating-point number that gives IR2 cold tip temperature (70-350) in Kelvin. The value of I2_T_P1 is valid when it is below 70 [K], and the value of I2_T_P2 is effective when it is above 70 [K].

8.19.3 Example(s)

- 273.49

8.20 I2_T_C1B

8.20.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: original bytes for I2_T_C1
- level: any
- pds3: (None)
- unit: (None)

8.20.2 Definition

The value field shall contain a string that gives byte string, in the format 'xx:aabbcc...', used to calculate the value of I2_T_C1. There are I2_IMGNM 2-digit hexadecimal numbers (aa, bb, cc, ..., etc.) while xx is their representative value. The value xx is converted to I2_T_C1.

8.20.3 Example(s)

- 'E4:DFE4E4E3E4E4E3E4E4'

8.21 I2_T_C2B

8.21.1 Attributes

- status: approved

- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: original bytes for I2_T_C2
- level: any
- pds3: (None)
- unit: (None)

8.21.2 Definition

The value field shall contain a string that gives byte string, in the format 'xx:aabbcc...', used to calculate the value of I2_T_C2. There are I2_IMGNM 2-digit hexadecimal numbers (aa, bb, cc, ..., etc.) while xx is their representative value. The value xx is converted to I2_T_C2.

8.21.3 Example(s)

- '0D:0D0D0D0D0D0D0D0D0D'

8.22 I2_T_OPB

8.22.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: original bytes for I2_T_OP
- level: any
- pds3: (None)
- unit: (None)

8.22.2 Definition

The value field shall contain a string that gives byte string, in the format 'xx:aabbcc...', used to calculate the value of I2_T_OP. There are I2_IMGNM 2-digit hexadecimal numbers (aa, bb, cc, ..., etc.) while xx is their representative value. The value xx is converted to I2_T_OP.

8.22.3 Example(s)

- '32:323232323232323232'

8.23 I2_T_CHB

8.23.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: original bytes for I2_T_CH
- level: any

- pds3: (None)
- unit: (None)

8.23.2 Definition

The value field shall contain a string that gives byte string, in the format 'xx:aabbcc...', used to calculate the value of I2_T_CH. There are I2_IMGNM 2-digit hexadecimal numbers (aa, bb, cc, ..., etc.) while xx is their representative value. The value xx is converted to I2_T_CH.

8.23.3 Example(s)

- 'A0:A0A0A09F9F9F9F9F9F'

8.24 I2_T_CMB

8.24.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: original bytes for I2_T_CMB
- level: any
- pds3: (None)
- unit: (None)

8.24.2 Definition

The value field shall contain a string that gives byte string, in the format 'xx:aabbcc...', used to calculate the value of I2_T_CM. There are I2_IMGNM 2-digit hexadecimal numbers (aa, bb, cc, ..., etc.) while xx is their representative value. The value xx is converted to I2_T_CM.

8.24.3 Example(s)

- '99:999999999898989898'

8.25 I2_T_HDB

8.25.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: original bytes for I2_T_HD
- level: any
- pds3: (None)
- unit: (None)

8.25.2 Definition

The value field shall contain a string that gives byte string, in the format 'xx:aabbcc...', used to calculate the value of I2_T_HD. There are I2_IMGNM 2-digit hexadecimal numbers (aa, bb, cc, ..., etc.) while xx is their representative value. The value xx is converted to I2_T_HD.

8.25.3 Example(s)

- '5A:5A5A5A5A5A5A5A5A5A'

8.26 I2_T_P1B

8.26.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: original bytes for I2_T_P1
- level: any
- pds3: (None)
- unit: (None)

8.26.2 Definition

The value field shall contain a string that gives byte string, in the format 'xx:aabbcc...', used to calculate the value of I2_T_P1. There are I2_IMGNM 2-digit hexadecimal numbers (aa, bb, cc, ..., etc.) while xx is their representative value. The value xx is converted to I2_T_P1.

8.26.3 Example(s)

- 'AD:ADADADADADACACACAC'

8.27 I2_T_P2B

8.27.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: original bytes for I2_T_P2
- level: any
- pds3: (None)
- unit: (None)

8.27.2 Definition

The value field shall contain a string that gives byte string, in the format 'xx:aabbcc...', used to calculate the value of I2_T_P2. There are I2_IMGNM 2-digit hexadecimal numbers (aa, bb, cc, ..., etc.) while xx is their representative value. The value xx is converted to I2_T_P2.

8.27.3 Example(s)

- '06:060606060606060606'

8.28 I2_T_C1R

8.28.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: resolution per a digit for I2_T_C1 [K]
- level: any
- pds3: (None)
- unit: (None)

8.28.2 Definition

The value field shall contain a non-negative floating-point number that gives resolution (in Kelvin) per digit for the value of I2_T_C1. Combined with the byte string in I2_T_C1B, the temperature stability in an imaging session will be evaluated.

8.28.3 Example(s)

- 0.08658

8.29 I2_T_C2R

8.29.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: resolution per a digit for I2_T_C2 [K]
- level: any
- pds3: (None)
- unit: (None)

8.29.2 Definition

The value field shall contain a non-negative floating-point number that gives resolution (in Kelvin) per digit for the value of I2_T_C2. Combined with the byte string in I2_T_C2B, the temperature stability in an imaging session will be evaluated.

8.29.3 Example(s)

- 1.2963

8.30 I2_T_OPR

8.30.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: resolution per a digit for I2_T_OP [K]
- level: any
- pds3: (None)
- unit: (None)

8.30.2 Definition

The value field shall contain a non-negative floating-point number that gives resolution (in Kelvin) per digit for the value of I2_T_OP. Combined with the byte string in I2_T_OPB, the temperature stability in an imaging session will be evaluated.

8.30.3 Example(s)

- 0.75221

8.31 I2_T_CHR

8.31.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: resolution per a digit for I2_T_CH [K]
- level: any
- pds3: (None)
- unit: (None)

8.31.2 Definition

The value field shall contain a non-negative floating-point number that gives resolution (in Kelvin) per digit for the value of I2_T_CH. Combined with the byte string in I2_T_CHB, the temperature stability in an imaging session will be evaluated.

8.31.3 Example(s)

- 0.54545

8.32 I2_T_CMR

8.32.1 Attributes

- status: approved

- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: resolution per a digit for I2_T_CM [K]
- level: any
- pds3: (None)
- unit: (None)

8.32.2 Definition

The value field shall contain a non-negative floating-point number that gives resolution (in Kelvin) per digit for the value of I2_T_CM. Combined with the byte string in I2_T_CMB, the temperature stability in an imaging session will be evaluated.

8.32.3 Example(s)

- 0.54545

8.33 I2_T_HDR

8.33.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: resolution per a digit for I2_T_HD [K]
- level: any
- pds3: (None)
- unit: (None)

8.33.2 Definition

The value field shall contain a non-negative floating-point number that gives resolution (in Kelvin) per digit for the value of I2_T_HD. Combined with the byte string in I2_T_HDB, the temperature stability in an imaging session will be evaluated.

8.33.3 Example(s)

- 0.65217

8.34 I2_T_P1R

8.34.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: resolution per a digit for I2_T_P1 [K]
- level: any

- pds3: (None)
- unit: (None)

8.34.2 Definition

The value field shall contain a non-negative floating-point number that gives resolution (in Kelvin) per digit for the value of I2_T_P1. Combined with the byte string in I2_T_P1B, the temperature stability in an imaging session will be evaluated.

8.34.3 Example(s)

- 0.10917

8.35 I2_T_P2R

8.35.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: resolution per a digit for I2_T_P2 [K]
- level: any
- pds3: (None)
- unit: (None)

8.35.2 Definition

The value field shall contain a non-negative floating-point number that gives resolution (in Kelvin) per digit for the value of I2_T_P2. Combined with the byte string in I2_T_P2B, the temperature stability in an imaging session will be evaluated.

8.35.3 Example(s)

- 1.23348

8.36 I2_CLKn

8.36.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: IR2 CLKn DAC value
- level: any
- pds3: (None)
- unit: (None)

8.36.2 Definition

The value field shall contain a character string of hexadecimal value that gives IR2 clock no. n DAC (digital to analog converter) value, where n is 01, 02, . . . , 15. These values represents various voltage setups.

8.36.3 Example(s)

- '0x80'

8.37 I2_C2F

8.37.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: method for converting pixel counts to flux
- level: L2
- pds3: (None)
- unit: (None)

8.37.2 Definition

The value field shall contain a character string that gives the method for converting pixel counts to flux.

8.37.3 Example(s)

- 'Flux [W mˆ-2 srˆ-1 umˆ-1] = (Counts*K1+K0) / Exposure / Solid_Angle'

8.38 I2_C2FK1

8.38.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: K1 for
- level: L2
- pds3: (None)
- unit: (None)

8.38.2 Definition

The value field shall contain a floating-point number that gives the value K1 in the value of I2_C2F.

8.38.3 Example(s)

- 2.6e-11

8.39 I2_C2FK0

8.39.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: K0 for
- level: L2
- pds3: (None)
- unit: (None)

8.39.2 Definition

The value field shall contain a floating-point number that gives the value K0 in the value of I2_C2F.

8.39.3 Example(s)

- 0.0

8.40 I2_C2FSA

8.40.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: solid angle per a pixel [sr/pixel]
- level: L2
- pds3: (None)
- unit: (None)

8.40.2 Definition

The value field shall contain a floating-point number that gives the value SOLID_ANGLE in the value of I2_C2F.

8.40.3 Example(s)

- 3.959e-08

8.41 I2_FLAT

8.41.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string

- comment: filename of flat-field image
- level: any
- pds3: (None)
- unit: (None)

8.41.2 Definition

The value field shall contain a character string that gives filename of the flat-field image that is used to calibrate.

8.41.3 Example(s)

- '226um_54sec_clean.fit'

8.42 I2_TCVER

8.42.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: version for temperature correction of flat
- level: L2
- pds3: (None)
- unit: (None)

8.42.2 Definition

The value field shall contain a character string that gives the version string of temperature correction of flat. This version string is for the value of the keywords I2_TC00, I2_TC10, I2_TC01, and I2_TC11.

8.42.3 Example(s)

- 'V0.5 (2016-09-20)'

8.43 I2_TCF00

8.43.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: TC factor for quad(0,0)
- level: L2
- pds3: (None)
- unit: (None)

8.43.2 Definition

The value field shall contain a floating-point number that gives temperature correction (TC) factor for lower-left quadrant (named quad(0,0)). The pixels in lower-left quadrant are multiplied by the value of the keyword I2_TCF00 to correct the small difference of sensitivity through four quadrants of the CCD area.

8.43.3 Example(s)

- 1.0456033

8.44 I2_TCF10

8.44.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: TC factor for quad(1,0)
- level: L2
- pds3: (None)
- unit: (None)

8.44.2 Definition

The value field shall contain a floating-point number that gives temperature correction (TC) factor for lower-right quadrant (named quad(1,0)). The pixels in lower-right quadrant are multiplied by the value of the keyword I2_TCF10 to correct the small difference of sensitivity through four quadrants of the CCD area.

8.44.3 Example(s)

- 1.0533285

8.45 I2_TCF01

8.45.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: TC factor for quad(0,1)
- level: L2
- pds3: (None)
- unit: (None)

8.45.2 Definition

The value field shall contain a floating-point number that gives temperature correction (TC) factor for upper-left quadrant (named quad(0,1)). The pixels in upper-left quadrant are multiplied by the value of the keyword I2_TCF01 to correct the small difference of sensitivity through four quadrants of the CCD area.

8.45.3 Example(s)

- 0.9446834

8.46 I2_TCF11

8.46.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: TC factor for quad(1,1)
- level: L2
- pds3: (None)
- unit: (None)

8.46.2 Definition

The value field shall contain a floating-point number that gives temperature correction (TC) factor for upper-right quadrant (named quad(1,1)). The pixels in upper-right quadrant are multiplied by the value of the keyword I2_TCF11 to correct the small difference of sensitivity through four quadrants of the CCD area.

8.46.3 Example(s)

- 0.9611318

8.47 I2_TRSP4

8.47.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: transposition of pixels (1-4)
- level: L2
- pds3: (None)
- unit: (None)

8.47.2 Definition

The value field shall contain a character string that gives the positions of first four pixels in image after transposition. The first to fourth positions in the value of I2_TRSP4 indicate the position where corresponding pixels are relocated. In normal imaging mode, such transposition is seamlessly on board, while in "zodiacal light" mode, it is done in the Level 1 to Level 2 conversion. Therefore, this I12_TRSP4 keyword only appears in "zodiacal light" mode L2 images.

8.47.3 Example(s)

- '[1, 1][520, 1][1,520][520,520]'

8.48 I2_TRSP8

8.48.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: transposition of pixels (5-8)
- level: L2
- pds3: (None)
- unit: (None)

8.48.2 Definition

The value field shall contain a character string that gives the positions of 5th, 6th, 7th, and 8th pixels in image after transposition. The 5th to 8th positions in the value of I2_TRSP8 indicate the position where corresponding pixels are relocated. In normal imaging mode, such transposition is seamlessly on board, while in "zodiacal light" mode, it is done in the Level 1 to Level 2 conversion. Therefore, this I12_TRSP4 keyword only appears in "zodiacal light" mode L2 images.

8.48.3 Example(s)

- '[2, 1][519, 1][2,520][519,520]'

8.49 I2_C2E

8.49.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: number of electrons per count
- level: any
- pds3: (None)
- unit: (None)

8.49.2 Definition

The value field shall contain a non-negative floating-point number that gives number of electrons per count for the detector.

8.49.3 Example(s)

- 70.0
- 7.0

8.50 I2_PTTRN

8.50.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: version string for IR clock-pattern program
- level: any
- pds3: (None)
- unit: (None)

8.50.2 Definition

The value field shall contain a character string that gives version string for IR clock-pattern program. The program is a compilation of clock patterns each of which drives the CCD with various exposure time, cal-lamp setting, etc.

8.50.3 Example(s)

- '2010.11.29'

8.51 I2_FSNR

8.51.1 Attributes

- status: proposed
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: S/N ratio of the flat used to calibrate
- level: L2
- pds3: (None)
- unit: (None)

8.51.2 Definition

The value field shall contain a non-negative floating-point number that gives signal to noise ratio of the flat used to calibrate image.

8.51.3 Example(s)

- 0.0

8.52 I2_DVER

8.52.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: version of keyword dictionary for IR2
- level: any
- pds3: (None)
- unit: (None)

8.52.2 Definition

The value field shall contain a character string that gives the version string of FITS header keyword dictionary of VCO data for IR2 camera.

8.52.3 Example(s)

- '2016-08-24'

9 VCO LIR-specific Keywords

9.1 LI_PDATE

9.1.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: LIR telemetry processing date in UTC
- level: any
- pds3: (None)
- unit: (None)

9.1.2 Definition

The value field shall contain a string that gives telemetry processing date for LIR images in UTC. The format of the string is same as DATE keyword.

9.1.3 Example(s)

- '2010-12-15T15:10:52'

9.2 LI_IMID

9.2.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: integer
- comment: LIR image ID
- level: any
- pds3: (None)
- unit: (None)

9.2.2 Definition

The value field shall contain a non-negative integer that gives the image ID included in the telemetry. This keyword is mainly used for debug. The value must be within the range from 0 to 65535 (16 bit unsigned integer). The MSB is status bit that represents whether sensor status exists. If the sensor status exists, the MSB becomes 0, otherwise it becomes 1. If the image has experienced some operations onboard, the sensor status doesn't exist. The other 15 bits are ID associated with taking image that is within from 0 to 32767.

9.2.3 Example(s)

- 63649

9.3 LI_PLTON

9.3.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: LIR Peltier ON/OFF
- level: any
- pds3: (None)
- unit: (None)

9.3.2 Definition

The value field shall contain a character string of either 'ON' or 'OFF', which gives the power status of the Peltier cooler/heater for temperature stabilization of the micro-bolometer of LIR. Usually an image is acquired while the Peltier cooler is turned-on.

9.3.3 Example(s)

- 'ON'
- 'OFF'

9.4 LI_PLTST

9.4.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: LIR Peltier status
- level: any
- pds3: (None)
- unit: (None)

9.4.2 Definition

The value field shall contain a character string of either '10C' or '40C', which gives the set value of temperature stabilization of the micro-bolometer by the Peltier cooler/heater of LIR.

9.4.3 Example(s)

- '40C'
- '10C'

9.5 LI_BOLST

9.5.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: LIR bolometer status
- level: any
- pds3: (None)
- unit: (None)

9.5.2 Definition

The value field shall contain a character string that gives status of the micro-bolometer of LIR. This value should be 'NORM' when LIR is in an operation mode of image acquisition and 'PRT' when LIR is in any other operation modes.

9.5.3 Example(s)

- 'NORM'
- 'PRT'

9.6 LI_NINT1

9.6.1 Attributes

- lastupdate: 2020-03-18
- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: integer
- comment: LIR number of the first accumulation (m)
- level: any
- pds3: VCO:LIR_FIRST_ACCUMULATION
- unit: (None)

9.6.2 Definition

The value field shall contain a positive integer that gives number of the first accumulation for LIR image (called 'm').

9.6.3 Example(s)

- 32

9.7 LI_NINT2

9.7.1 Attributes

- lastupdate: 2020-03-18
- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: integer
- comment: LIR number of the second accumulation (n)
- level: any
- pds3: VCO:LIR_SECOND_ACCUMULATION
- unit: (None)

9.7.2 Definition

The value field shall contain a positive integer that gives number of the second accumulation for LIR image (called 'n').

9.7.3 Example(s)

- 32

9.8 LI_BOLTA

9.8.1 Attributes

- status: approved

- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: integer
- comment: LIR bolometer calibration target
- level: any
- pds3: (None)
- unit: (None)

9.8.2 Definition

The value field shall contain a non-negative integer that gives a target value for an average of outputs from all pixels of the micro-bolometer of LIR when onboard calibration of the micro-bolometer is executed. Usually this value should be set to be the center value of 12-bit integers.

9.8.3 Example(s)

- 2048

9.9 LI_BOLRA

9.9.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: integer
- comment: LIR bolometer calibration range
- level: any
- pds3: (None)
- unit: (None)

9.9.2 Definition

The value field shall contain a non-negative integer that gives a target value which determines the temperature range measured by LIR when onboard calibration of the micro-bolometer is executed.

9.9.3 Example(s)

- 8

9.10 LI_CENTI

9.10.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: LIR center TI of integration
- level: any
- pds3: VCO:LIR_MEDIAN_TIME

- unit: (None)

9.10.2 Definition

The value field shall contain a character string that gives the VCO spacecraft clock count value in SPICE SCLK format string corresponding to central time of images to get the accumulated image.

9.10.3 Example(s)

- '1/000559394583'

9.11 LI_BOL_T

9.11.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: LIR mean bolometer temperature [deg C]
- level: any
- pds3: INSTRUMENT_TEMPERATURE_POINT, LIR bolometer
- unit: degC

9.11.2 Definition

The value field shall contain a floating-point number that gives LIR mean bolometer temperature in degrees Celsius.

9.11.3 Example(s)

- 39.909

9.12 LI_PKG_T

9.12.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: LIR mean package temperature [deg C]
- level: any
- pds3: INSTRUMENT_TEMPERATURE_POINT, LIR package
- unit: degC

9.12.2 Definition

The value field shall contain a floating-point number that gives LIR mean bolometer package temperature in degrees Celsius.

9.12.3 Example(s)

- 25.451

9.13 LI_CAS_T

9.13.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: LIR mean case temperature [deg C]
- level: any
- pds3: INSTRUMENT_TEMPERATURE_POINT, LIR case
- unit: degC

9.13.2 Definition

The value field shall contain a floating-point number that gives a mean case temperature of LIR-S in degrees Celsius.

9.13.3 Example(s)

- 25.614

9.14 LI_SHT_T

9.14.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: LIR mean shutter temperature [deg C]
- level: any
- pds3: INSTRUMENT_TEMPERATURE_POINT, LIR shutter
- unit: degC

9.14.2 Definition

The value field shall contain a floating-point number that gives mean shutter temperature for LIR camera in degrees Celsius.

9.14.3 Example(s)

- 25.95

9.15 LI_LEN_T

9.15.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: LIR mean lens temperature [deg C]
- level: any
- pds3: INSTRUMENT_TEMPERATURE_POINT, LIR lens
- unit: degC

9.15.2 Definition

The value field shall contain a floating-point number that gives mean lens temperature for LIR camera in degrees Celsius.

9.15.3 Example(s)

- 28.088

9.16 LI_BGR

9.16.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: LIR mean BGR voltage [V]
- level: any
- pds3: INSTRUMENT_VOLTAGE_POINT, LIR band gap reference
- unit: V

9.16.2 Definition

The value field shall contain a floating-point number that gives a mean voltage in the circuit for a band gap reference in the micro-bolometer array of LIR in volts. This parameter is used for developers only.

9.16.3 Example(s)

- 1.21

9.17 LI_VB1

9.17.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image

- datatype: real
- comment: LIR mean VB1 voltage [V]
- level: any
- pds3: INSTRUMENT_VOLTAGE_POINT, LIR fixed pattern noise for calibration
- unit: V

9.17.2 Definition

The value field shall contain a floating-point number that gives a mean voltage in the circuit for calibration of the on-chip fixed pattern noise in the micro-bolometer array of LIR in volts. This parameter is used for developers only.

9.17.3 Example(s)

- 4.08

9.18 LI_ADOFS

9.18.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: LIR mean A/D_OFS voltage [V]
- level: any
- pds3: INSTRUMENT_VOLTAGE_POINT, LIR mean offset voltage for input signal
- unit: V

9.18.2 Definition

The value field shall contain a floating-point number that gives a mean offset voltage applied to the analog input signal in the analog-to-digital converter circuit of LIR in volts. This parameter is used for developers only.

9.18.3 Example(s)

- 8.54

9.19 LI_HKU

9.19.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: LIR HK time for calibration (UTC)
- level: any
- pds3: (None)
- unit: (None)

9.19.2 Definition

The value field shall contain a string that gives the time for LIR image calibration in UTC. This value is used to calculate HK data at the observation, by using linear interpolation with two HK data obtained at nearest time before observation, a value of LI_HKU0, and at nearest time after observation, a value of LI_HKU1. This value will be chosen as an appropriate time for image calibration by temperatures at several points and will be nearly equal to the value of DATE-OBS, DATE-BEG, or DATE-END, but not necessary. The format of the string is same as DATE keyword.

9.19.3 Example(s)

- '2017-01-25T04:08:19.882'
- 'N/A'

9.20 LI_HD_T

9.20.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real, string
- comment: LIR baffle temperature [deg C]
- level: any
- pds3: INSTRUMENT_TEMPERATURE_POINT, LIR hood
- unit: degC

9.20.2 Definition

The value field shall contain a string that gives LIR baffle (hood) temperature in degrees Celsius interpolated linearly with two HK data which were obtained at each nearest timing before and after the observation time, a value of LI_HKU.

9.20.3 Example(s)

- -42.652
- 'N/A'

9.21 LI_PN_T

9.21.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real, string
- comment: LIR panel temperature [deg C]
- level: any
- pds3: INSTRUMENT_TEMPERATURE_POINT, LIR panel
- unit: degC

9.21.2 Definition

The value field shall contain a string that gives LIR panel temperature in degrees Celsius interpolated linearly with two HK data which were obtained at each nearest timing before and after the observation time, a value of LI_HKU.

9.21.3 Example(s)

- 21.913
- 'N/A'

9.22 LI_LM_T

9.22.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real, string
- comment: LIR lens mount temperature [deg C]
- level: any
- pds3: INSTRUMENT_TEMPERATURE_POINT, LIR lens mount
- unit: degC

9.22.2 Definition

The value field shall contain a string that gives LIR lens mount temperature in degrees Celsius interpolated linearly with two HK data which were obtained at each nearest timing before and after the observation time, a value of LI_HKU.

9.22.3 Example(s)

- 27.138
- 'N/A'

9.23 LI_AE_T

9.23.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real, string
- comment: LIR analog electronics temperature [deg C]
- level: any
- pds3: INSTRUMENT_TEMPERATURE_POINT, LIR analog electronics
- unit: degC

9.23.2 Definition

The value field shall contain a string that gives LIR analog electronics temperature in degrees Celsius interpolated linearly with two HK data which were obtained at each nearest timing before and after the observation time, a value of LI_HKU.

9.23.3 Example(s)

- 20.866
- 'N/A'

9.24 LI_HKU0

9.24.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: LIR HK acquisition time before obs. (UTC)
- level: any
- pds3: (None)
- unit: (None)

9.24.2 Definition

The value field shall contain a string that gives a HK acquisition time in UTC that is the nearest time with HK data before observation that corresponds to a value of LI_HKU. The format of the string is same as DATE keyword.

9.24.3 Example(s)

- '2017-01-25T04:08:19.882'
- 'N/A'

9.25 LI_HKU1

9.25.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: LIR HK acquisition time after obs. (UTC)
- level: any
- pds3: (None)
- unit: (None)

9.25.2 Definition

The value field shall contain a string that gives a HK acquisition time in UTC that is the nearest time with HK data after observation that corresponds to a value of LI_HKU. The format of the string is same as DATE keyword.

9.25.3 Example(s)

- '2017-01-25T04:08:20'
- 'N/A'

9.26 LI_HD_T0

9.26.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real, string
- comment: LIR baffle temperature before obs. [deg C]
- level: any
- pds3: (None)
- unit: (None)

9.26.2 Definition

The value field shall contain a string that gives LIR baffle (hood) temperature in degrees Celsius obtained at a value of LI_HKU0.

9.26.3 Example(s)

- -42.652
- 'N/A'

9.27 LI_HD_T1

9.27.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real, string
- comment: LIR baffle temperature after obs. [deg C]
- level: any
- pds3: (None)
- unit: (None)

9.27.2 Definition

The value field shall contain a string that gives LIR baffle (hood) temperature in degrees Celsius obtained at a value of LI_HKU1.

9.27.3 Example(s)

- -42.652
- 'N/A'

9.28 LI_PN_T0

9.28.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real, string
- comment: LIR panel temperature before obs. [deg C]
- level: any
- pds3: (None)
- unit: (None)

9.28.2 Definition

The value field shall contain a string that gives LIR panel temperature in degrees Celsius obtained at a value of LI_HKU0.

9.28.3 Example(s)

- 21.913
- 'N/A'

9.29 LI_PN_T1

9.29.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real, string
- comment: LIR panel temperature after obs. [deg C]
- level: any
- pds3: (None)
- unit: (None)

9.29.2 Definition

The value field shall contain a string that gives LIR panel temperature in degrees Celsius obtained at a value of LI_HKU1.

9.29.3 Example(s)

- 21.913
- 'N/A'

9.30 LI_LM_T0

9.30.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real, string
- comment: LIR lens mount temperature before obs. [deg C]
- level: any
- pds3: (None)
- unit: (None)

9.30.2 Definition

The value field shall contain a string that gives LIR lens mount temperature in degrees Celsius obtained at a value of LI_HKU0.

9.30.3 Example(s)

- 21.913
- 'N/A'

9.31 LI_LM_T1

9.31.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real, string
- comment: LIR lens mount temperature after obs. [deg C]
- level: any
- pds3: (None)
- unit: (None)

9.31.2 Definition

The value field shall contain a string that gives LIR lens mount temperature in degrees Celsius obtained at a value of LI_HKU1.

9.31.3 Example(s)

- 21.913
- 'N/A'

9.32 LI_AE_T0

9.32.1 Attributes

- status: approved

- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: LIR analog electronics temp. before obs. [deg C]
- level: any
- pds3: (None)
- unit: (None)

9.32.2 Definition

The value field shall contain a string that gives LIR analog electronics temperature in degrees Celsius obtained at a value of LI_HKU0.

9.32.3 Example(s)

- 21.913
- 'N/A'

9.33 LI_AE_T1

9.33.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real, string
- comment: LIR analog electronics temp. after obs. [deg C]
- level: any
- pds3: (None)
- unit: (None)

9.33.2 Definition

The value field shall contain a string that gives LIR analog electronics temperature in degrees Celsius obtained at a value of LI_HKU1.

9.33.3 Example(s)

- 21.913
- 'N/A'

9.34 LI_HKD0

9.34.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real, string
- comment: LIR HK delta sec before observation [s]
- level: any

- pds3: (None)
- unit: (None)

9.34.2 Definition

The value field shall contain a string that gives a time difference between observation time, a value of LI_HKU, and HK acquisition time at the nearest time with HK data before observation, a value of LI_HKU0.

9.34.3 Example(s)

- -63.882
- 'N/A'

9.35 LI_HKD1

9.35.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real, string
- comment: LIR HK delta sec after observation [s]
- level: any
- pds3: (None)
- unit: (None)

9.35.2 Definition

The value field shall contain a string that gives a time difference between observation time, a value of LI_HKU, and HK acquisition time at the nearest time with HK data after observation, a value of LI_HKU1.

9.35.3 Example(s)

- 0.118
- 'N/A'

9.36 LI_TnC

9.36.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: LIR TI at image No. n SHT CLS
- level: any
- pds3: (None)
- unit: (None)

9.36.2 Definition

The value field shall contain a character string that gives the VCO spacecraft clock count value in SPICE SCLK format string for the n-th image when shutter is closed where n is 001, 002, . . . , 032.

9.36.3 Example(s)

- '1/000559392534'

9.37 LI_TnO

9.37.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: LIR TI at image No. n SHT OPN
- level: any
- pds3: (None)
- unit: (None)

9.37.2 Definition

The value field shall contain a character string that gives the VCO spacecraft clock count value in SPICE SCLK format string for the n-th image when shutter is opened where n is 001, 002, . . . , 032.

9.37.3 Example(s)

- '1/000559392599'

9.38 LI_BnC

9.38.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: LIR BOL_T [deg C] at image No. n SHT CLS
- level: any
- pds3: (None)
- unit: (None)

9.38.2 Definition

The value field shall contain a floating-point number that gives the bolometer temperature in degrees Celsius for n-th image when shutter is closed where n is 001, 002, . . . , 032.

9.38.3 Example(s)

- 39.92

9.39 LI_BnO

9.39.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: LIR BOL_T [deg C] at image No. n SHT OPN
- level: any
- pds3: (None)
- unit: (None)

9.39.2 Definition

The value field shall contain a floating-point number that gives the bolometer temperature in degrees Celsius for n-th image when shutter is opened where n is 001, 002, . . . , 032.

9.39.3 Example(s)

- 39.92

9.40 LI_PnC

9.40.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: LIR PKG_T [deg C] at image No. n SHT CLS
- level: any
- pds3: (None)
- unit: (None)

9.40.2 Definition

The value field shall contain a floating-point number that gives the bolometer package temperature in degrees Celsius for n-th image when shutter is closed where n is 001, 002, . . . , 032.

9.40.3 Example(s)

- 25.44

9.41 LI_PnO

9.41.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: LIR PKG_T [deg C] at image No. n SHT OPN
- level: any
- pds3: (None)
- unit: (None)

9.41.2 Definition

The value field shall contain a floating-point number that gives the bolometer package temperature in degrees Celsius for n-th image when shutter is opened where n is 001, 002, . . . , 032.

9.41.3 Example(s)

- 25.44

9.42 LI_CnC

9.42.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: LIR CAS_T [deg C] at image No. n SHT CLS
- level: any
- pds3: (None)
- unit: (None)

9.42.2 Definition

The value field shall contain a floating-point number that gives the case temperature in degrees Celsius for n-th image when shutter is closed where n is 001, 002, . . . , 032.

9.42.3 Example(s)

- 25.61

9.43 LI_CnO

9.43.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image

- datatype: real
- comment: LIR CAS_T [deg C] at image No. n SHT OPN
- level: any
- pds3: (None)
- unit: (None)

9.43.2 Definition

The value field shall contain a floating-point number that gives the case temperature in degrees Celsius for n-th image when shutter is opened where n is 001, 002, . . . , 032.

9.43.3 Example(s)

- 25.61

9.44 LI_SnC

9.44.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: LIR SHT_T [deg C] at image No. n SHT CLS
- level: any
- pds3: (None)
- unit: (None)

9.44.2 Definition

The value field shall contain a floating-point number that gives the shutter temperature in degrees Celsius for n-th image when shutter is closed where n is 001, 002, . . . , 032.

9.44.3 Example(s)

- 25.94

9.45 LI_SnO

9.45.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: LIR SHT_T [deg C] at image No. n SHT OPN
- level: any
- pds3: (None)
- unit: (None)

9.45.2 Definition

The value field shall contain a floating-point number that gives the shutter temperature in degrees Celsius for n-th image when shutter is opened where n is 001, 002, . . . , 032.

9.45.3 Example(s)

- 25.94

9.46 LI_LnC

9.46.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: LIR LEN_T [deg C] at image No. n SHT CLS
- level: any
- pds3: (None)
- unit: (None)

9.46.2 Definition

The value field shall contain a floating-point number that gives the lens temperature in degrees Celsius for n-th image when shutter is closed where n is 001, 002, . . . , 032.

9.46.3 Example(s)

- 27.27

9.47 LI_LnO

9.47.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: LIR LEN_T [deg C] at image No. n SHT OPN
- level: any
- pds3: (None)
- unit: (None)

9.47.2 Definition

The value field shall contain a floating-point number that gives the lens temperature in degrees Celsius for n-th image when shutter is opened where n is 001, 002, . . . , 032.

9.47.3 Example(s)

- 27.25

9.48 LI_GnC

9.48.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: LIR BGR [V] at image No. n SHT CLS
- level: any
- pds3: (None)
- unit: (None)

9.48.2 Definition

The value field shall contain a floating-point number that gives a reference voltage used in the microbolometer array in volts for the n-th image acquired by LIR when the shutter is closed, where n is 001, 002, . . . , or 032.

9.48.3 Example(s)

- 1.21

9.49 LI_GnO

9.49.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: LIR BGR [V] at image No. n SHT OPN
- level: any
- pds3: (None)
- unit: (None)

9.49.2 Definition

The value field shall contain a floating-point number that gives a reference voltage used in the microbolometer array in volts for the n-th image acquired by LIR when the shutter is opened, where n is 001, 002, . . . , or 032.

9.49.3 Example(s)

- 1.21

9.50 LI_VnC

9.50.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: LIR VB1 [V] at image No. n SHT CLS
- level: any
- pds3: (None)
- unit: (None)

9.50.2 Definition

The value field shall contain a floating-point number that gives a reference voltage used in the microbolometer array in volts for the n-th image acquired by LIR when the shutter is closed, where n is 001, 002, . . . , or 032.

9.50.3 Example(s)

- 4.08

9.51 LI_VnO

9.51.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: LIR VB1 [V] at image No. n SHT OPN
- level: any
- pds3: (None)
- unit: (None)

9.51.2 Definition

The value field shall contain a floating-point number that gives a reference voltage used in the microbolometer array in volts for the n-th image acquired by LIR when the shutter is opened, where n is 001, 002, . . . , or 032.

9.51.3 Example(s)

- 4.08

9.52 LI_AnC

9.52.1 Attributes

- status: approved

- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: LIR AD_OFS [V] at image No. n SHT CLS
- level: any
- pds3: (None)
- unit: (None)

9.52.2 Definition

The value field shall contain a floating-point number that gives a reference voltage used in the analog-to-digital converter circuit in volts for the n-th image acquired by LIR when the shutter is closed, where n is 001, 002, . . . , or 032.

9.52.3 Example(s)

- 8.54

9.53 LI_AnO

9.53.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: LIR AD_OFS [V] at image No. n SHT OPN
- level: any
- pds3: (None)
- unit: (None)

9.53.2 Definition

The value field shall contain a floating-point number that gives a reference voltage used in the analog-to-digital converter circuit in volts for the n-th image acquired by LIR when the shutter is opened, where n is 001, 002, . . . , or 032.

9.53.3 Example(s)

- 8.54

9.54 LI_C2T

9.54.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: method for converting pixel counts to brightness temperature
- level: L2

- pds3: (None)
- unit: (None)

9.54.2 Definition

The value field shall contain a character string that gives the method for converting pixel counts to brightness temperature.

9.54.3 Example(s)

- 'See lircal.txt'

9.55 LI_C2TSC

9.55.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: scaling table filename
- level: L2
- pds3: (None)
- unit: (None)

9.55.2 Definition

The value field shall contain a character string that gives filename of scaling table used to calculate brightness temperature from counts.

9.55.3 Example(s)

- 'lir_scaling_m32n32_v01.fit'

9.56 LI_C2TOF

9.56.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: offset table filename
- level: L2
- pds3: (None)
- unit: (None)

9.56.2 Definition

The value field shall contain a character string that gives filename of offset table used to calculate brightness temperature from counts.

9.56.3 Example(s)

- 'lir_offset_m32n32_v01.fit'

9.57 LI_C2TSH

9.57.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: shutter table filename
- level: L2
- pds3: (None)
- unit: (None)

9.57.2 Definition

The value field shall contain a character string that gives filename of shutter table used to calculate brightness temperature from counts.

9.57.3 Example(s)

- 'lir_shutter_m32n32_v01.fit'

9.58 LI_C2TRF

9.58.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: LIR reference temperature for shutter [deg C]
- level: L2
- pds3: (None)
- unit: (None)

9.58.2 Definition

The value field shall contain a floating-point number that gives a set value of reference temperature of the shutter of LIR in degrees Celsius.

9.58.3 Example(s)

- 24.0

9.59 LI_B_ERR

9.59.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: integer
- comment: LIR second accumulation bit error flag
- level: L2
- pds3: (None)
- unit: (None)

9.59.2 Definition

The value field shall contain a non-negative integer that gives an error flag for wrong bit-shift in onboard calculation of LIR, which happened from June 16 to September 28, 2016. If LI_B_ERR = 1, the error has happened and corrected with a correction equation. If LI_B_ERR = 0, no error has happened. Please see lircal.txt for more detail.

9.59.3 Example(s)

- 0
- 1

9.60 LI_C2TKn

9.60.1 Attributes

- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: Kn for LIR
- level: any
- pds3: (None)
- unit: (None)

9.60.2 Definition

The value field shall contain a floating-point number that gives coefficients used to calculate brightness temperature from counts where n is 0, 1, . . . , 7. For more detail, please see lircal.txt.

9.60.3 Example(s)

- 153.3229

9.61 LI_HKF

9.61.1 Attributes

- lastupdate: 2018-02-10
- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: integer
- comment: LIR HK interpolation flag
- level: any
- pds3: (None)
- unit: (None)

9.61.2 Definition

The value field shall contain an integer that gives interpolation condition of baffle temperature (LI_HD_T). 0 indicates one of LI_HD_T0 and LI_HD_T1 or both are 'N/A'. 1 indicates both LI_HD_T0 and LI_HD_T1 were acquired within 120 seconds from DATE-OBS. 2 indicates one of LI_HD_T0 and LI_HD_T1 or both were acquired within 2048 seconds from DATE-OBS.

9.61.3 Example(s)

- 0
- 1
- 2

9.62 LI_C2TBF

9.62.1 Attributes

- lastupdate: 2018-02-10
- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: LIR baffle table filename
- level: L2
- pds3: (None)
- unit: (None)

9.62.2 Definition

The value field shall contain a character string that gives filename of a calibration coefficient table used to correct brightness count in L1a/b which may vary due to baffle (hood) temperature variation and solar illumination direction (+Z or -Z).

9.62.3 Example(s)

- 'lir_baffle_201712_pz_v02.fit'

9.63 LI_C2TSR

9.63.1 Attributes

- lastupdate: 2018-02-10
- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: LIR SRF filename
- level: L2
- pds3: (None)
- unit: (None)

9.63.2 Definition

The value field shall contain a character string that gives filename of a sensor spectral response function of LIR, which is used to estimate thermal radiation from the baffle (hood) of LIR.

9.63.3 Example(s)

- 'lir_srf_v02.txt'

9.64 LI_C2TRB

9.64.1 Attributes

- lastupdate: 2018-02-10
- status: approved
- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: real
- comment: LIR reference temperature for baffle [deg C]
- level: L2
- pds3: (None)
- unit: (None)

9.64.2 Definition

The value field shall contain a floating-point number that gives a set value of reference temperature of the baffle (hood) of LIR in degrees Celsius.

9.64.3 Example(s)

- -43.15

9.65 LI_DVER

9.65.1 Attributes

- status: approved

- reference: VCO FITS header keyword dictionary
- hdu: image
- datatype: string
- comment: version of keyword dictionary for LIR
- level: any
- pds3: (None)
- unit: (None)

9.65.2 Definition

The value field shall contain a character string that gives the version string of FITS header keyword dictionary of VCO data for LIR camera.

9.65.3 Example(s)

- '2016-08-24'