Format Description

MCC Format

Disclaimer

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Safety Information

Contents

Format Description

The data format is an ASCII format with extension .mcc. The mcc file format is used by various PTW software packages and modules. Each line of the file contains a keyword without or with one or more data values. Keywords are only written with uppercase letters. If a data value is expected after a keyword an equals sign (=) separates the keyword from the data value. Between the keyword and the equals sign no space character is allowed. Every line finishes with CR/LF.

Apart from this, comment lines are allowed. These lines begin with a quotation mark (').

The data values have no format restrictions: Strings can have any length. An integer value need not have a specific number of digits. Floating point values do not need a specific number of decimals.

The data format consists of a header followed by the description and the measurement values of the scans.

Structure of the mcc file format:

Key name	Description
BEGIN_SCAN_DATA	identifier for the beginning of an mcc file
	header information
BEGIN_SCAN 1	identifier for the beginning of a scan 1
	scan description
BEGIN_DATA	identifier for the beginning of the measuring data
	scan data
END_DATA	identifier for the end of the measuring data
END_SCAN 1	identifier for the end of scan 1
BEGIN_SCAN 2	identifier for the beginning of a scan 2
	scan description
BEGIN_DATA	identifier for the beginning of the measuring data
	scan data
END_DATA	identifier for the end of the measuring data
END_SCAN 2	identifier for the end of scan 2
BEGIN_SCAN 3	identifier for the beginning of a scan 3
…	
END_SCAN n	identifier for the end of the last scan
END_SCAN_DATA	identifier for the end of an mcc file

For the curve description following keywords are required (even if there are more possible keywords to describe a curve only the most important ones are explained):

Key name	Data Type	Unit	Description
COMMENT	string		comment
MEAS_DATE	string		measuring date and time
MODALITY	string		modality: X (→ photons) EL (→ electrons) CO (→ cobalt) P (→ protons) N (→ neutrons) 12C (→ 12 C Ions) HP (→ heavy particles)
INPLANE_AXIS_DIR	string		direction of the inplane axis GUN_TARGET TARGET_GUN
CROSSPLANE_AXIS_DIR	string		direction of the crossplane axis LEFT_RIGHT RIGHT_LEFT
LINAC	String		LINAC name
ENERGY	float	[MeV] [MV]	energy
SSD	float	[mm]	source - detector - distance
BLOCK	string		name of the block
WEDGE	string		name of the wedge
FIELD_INPLANE	float	[mm]	field length in inplane direction
FIELD_CROSSPLANE	float	[mm]	field width in crossplane direction
FIELD_TYPE	string		form of the field: RECTANGULAR CIRCULAR IRREGULAR
GANTRY	float	[°]	gantry angle
GANTRY_UPRIGHT_POSITION	string		definition of the gantry upright position 0 (0 degrees) 180 (180 degrees)
GANTRY_ROTATION	string		rotation direction of the gantry CW (clockwise) CCW (counter clockwise)
COLL_ANGLE	float	[°]	collimator angle

Key name	Data Type	Unit	Description
SCAN_CURVETYPE	string		curve type: INPLANE_PROFILE CROSSPLANE_PROFILE DDC PDD TPRCURVE OUTPUT_FACTOR POINTS
SCAN_DEPTH	float	[mm]	depth of the profile
SCAN_OFFAXIS_INPLANE	float	[mm]	offaxis value in inplane direction
SCAN_OFFAXIS_CROSSPLANE	float	[mm]	offaxis value in crossplane direction
SCAN_ANGLE	float	[°]	measuring angle
SCAN_DIAGONAL	integer		FIRST_DIAGONAL SECOND_DIAGONAL NOT_DIAGONAL
MEAS_UNIT	string		unit of the measuring data C GY A.U. OD R cGy Gy/min

After the description of the curve the measuring values follow. They have following format:

BEGIN_DATA
     Meas. Pos. in [mm]   Meas. Value in [MEAS_UNIT]   Ref. Meas. Value in [Gy/min] Chamber
             ...   ...
     Meas. Pos. in [mm]   Meas. Value in [MEAS_UNIT]   Ref. Meas. Value in [Gy/min] Chamber
END_DATA

All values are separated by a space.

The reference measuring values are only available if the measurement was taken against a reference chamber. The chamber number is also not in every measurement available. If there are no reference dose values but chamber numbers, they will be saved directly after the dose values. The chamber numbers are signed with a '#'.

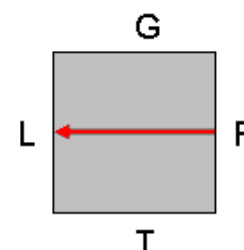| HINT |
|---|
| The measuring positions **are stored in arrow direction** in the scan. |

"Normal" crossplane profile

CROSSPLANE_AXIS_DIR	LEFT_RIGHT
SCAN_CURVETYPE	CROSSPLANE_PROFILE
SCAN_ANGLE	0
SCAN_DIAGONAL	NOT_DIAGONAL
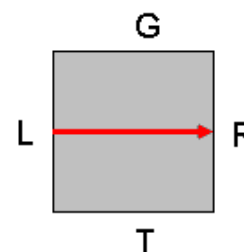
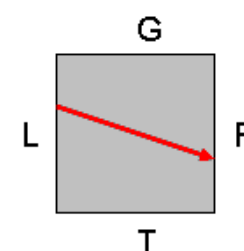### Crossplane profile at inverse direction definition of the linac

CROSSPLANE_AXIS_DIR	RIGHT_LEFT
SCAN_CURVETYPE	CROSSPLANE_PROFILE
SCAN_ANGLE	0
SCAN_DIAGONAL	NOT_DIAGONAL

Crossplane profile with measuring angle
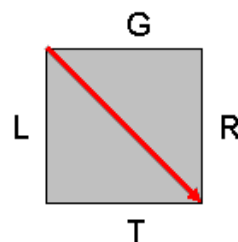
(angle clockwise, here 10°)

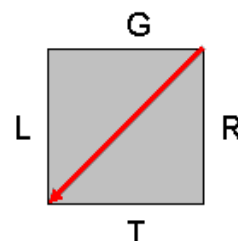|	
CROSSPLANE_AXIS_DIR	LEFT_RIGHT
SCAN_CURVETYPE	CROSSPLANE_PROFILE
SCAN_ANGLE	10
SCAN_DIAGONAL	NOT_DIAGONAL

Crossplane profile diagonal

(Measuring angle clockwise)

CROSSPLANE_AXIS_DIR	LEFT_RIGHT
SCAN_CURVETYPE	CROSSPLANE_PROFILE
SCAN_ANGLE	0
SCAN_DIAGONAL	FIRST_DIAGONAL

Crossplane profile second diagonal

| CROSSPLANE_AXIS_DIR	LEFT_RIGHT
SCAN_CURVETYPE	CROSSPLANE_PROFILE
SCAN_ANGLE	0
SCAN_DIAGONAL	SECOND_DIAGONAL

Crossplane profile with rotated collimator

(measuring angle anticlockwise, here 10°)

CROSSPLANE_AXIS_DIR	PTW_CROSSPLANE_DIR_LEFT_RIGHT
SCAN_CURVETYPE	CROSSPLANE_PROFILE
SCAN_ANGLE	0
SCAN_DIAGONAL	NOT_DIAGONAL
COLL_ANGLE	10
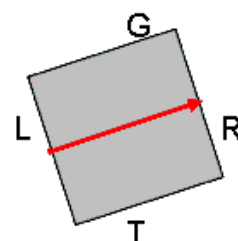
Crossplane profile outside of the beam centre

is a crossplane profile moved - here 100mm - it will be moved in the inplane direction. The direction depends on the definition of the inplane direction.

CROSSPLANE_AXIS_DIR	PTW_CROSSPLANE_DIR_LEFT_RIGHT
INPLANE_AXIS_DIR	PTW_INPLANE_DIR_TARGET_GUN
SCAN_CURVETYPE	CROSSPLANE_PROFILE
SCAN_ANGLE	0
SCAN_DIAGONAL	NOT _DIAGONAL
SCAN_OFFAXIS_INPLANE	100
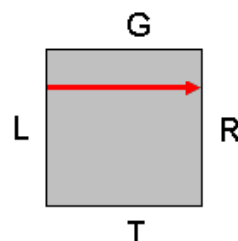
"Normal" inplane profile

INPLANE_AXIS_DIR	TARGET_GUN
SCAN_CURVETYPE	INPLANE_PROFILE
SCAN_ANGLE	0
SCAN_DIAGONAL	NOT _DIAGONAL
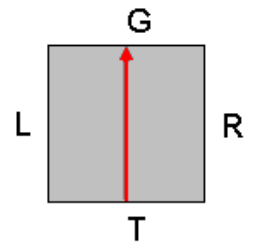
Definition of the Gantry:
View from target to gun

0° at GANTRY_UPRIGHT_POSITION = 0

GANTRY_ROTATION = CCW   GANTRY_ROTATION = CW

0° at GANTRY_UPRIGHT_POSITION = 180
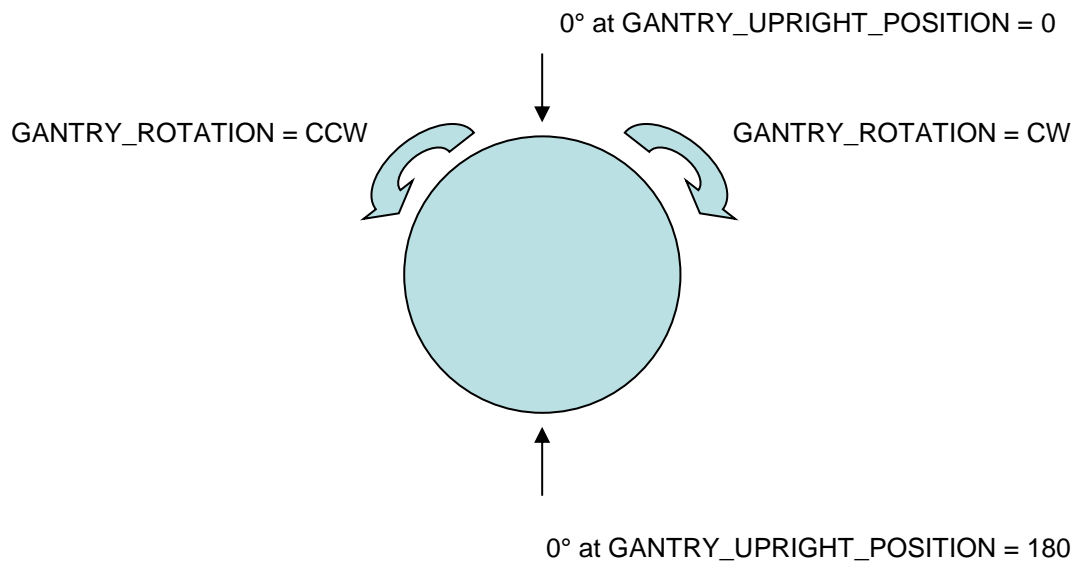
Example

```
BEGIN_SCAN_DATA
      FORMAT=CC-Export V1.9
      FILE_CREATION_DATE=04-Feb-2013 18:33:04
      LAST_MODIFIED=04-Feb-2013 18:33:04
      BEGIN_SCAN  1
            MEAS_DATE=04-Feb-2013 18:32:08
            LINAC=DEMO LINAC
            MODALITY=X
            INPLANE_AXIS_DIR=TARGET_GUN
            CROSSPLANE_AXIS_DIR=LEFT_RIGHT
            ENERGY=6.00
            SSD=1000.00
            WEDGE=None
            FIELD_INPLANE=100.00
            FIELD_CROSSPLANE=100.00
            FIELD_TYPE=RECTANGULAR
            GANTRY=0.00
            GANTRY_UPRIGHT_POSITION=0
            GANTRY_ROTATION=CW
            COLL_ANGLE=90.00
            SCAN_CURVETYPE=CROSSPLANE_PROFILE
            SCAN_DEPTH=0.00
            SCAN_OFFAXIS_INPLANE=0.00
            SCAN_ANGLE=0.00
            SCAN_DIAGONAL=NOT_DIAGONAL
            MEAS_UNIT=GY
            BEGIN_DATA
                  -130.00        11.241E-03
                  -120.00        13.875E-03
                  -110.00        16.952E-03
                  -100.00        21.434E-03
                  -90.00         28.492E-03
                  -80.00         39.271E-03
                  -70.00         57.493E-03
                  -60.00         89.827E-03
                  -50.00         304.17E-03
                  -40.00         869.36E-03
                  -30.00         913.80E-03
                  -20.00         928.58E-03
                  -10.00         933.88E-03
                  0.00           933.16E-03
                  10.00          937.07E-03
                  20.00          930.05E-03
                  30.00          915.56E-03
                  40.00          878.26E-03
                  50.00          464.27E-03
                  60.00          97.214E-03
                  70.00          60.303E-03
                  80.00          41.446E-03
                  90.00          29.831E-03
                  100.00         22.258E-03
                  110.00         17.417E-03
                  120.00         14.014E-03
                  130.00         11.792E-03
            END_DATA
      END_SCAN  1
END_SCAN_DATA
```