



Q-DAS ASCII Transfer Format

Version: 6 / August 2010

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Preface

The Q-DAS[®] products *procella*[®] and qs-STAT[®] are based on the Q-DAS[®] ASCII transfer format. This format has established itself as an industry standard. Certain instances require compliance with this data format from suppliers of measurement systems and manufacturers of SPC systems.

The advantages of a company wide uniform data format are self-evident. This makes it easy to combine measurement data from different measurement systems without any problems. Standardized data storage and evaluation of measurement values is easily realized. This is a precondition for the comparison of company-wide results. No data conversion is required. The level of mistakes is reduced accordingly. This applies particularly if the manufacturer gets a certificate of the Q-DAS[®] data format.

The documentation on hand describes the structure and specification of the Q-DAS[®] ASCII transfer format. You may find further details as well as an up-to-date version of the data format manual on the Q-DAS[®] website.

Remark:

Such, despite every effort, errors can never be fully precluded, we are grateful for notification of such errors.

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1 Introduction

1.1 ASCII Transfer Format Features

The ASCII transfer format is distinguished by:

- simple transparent structure (pure ASCII, variable)
- flexible (new contents are easily defined and integrated)
- space-saving (it is not necessary to save information which is not required, values may be saved in a convenient version)
- easily copied and compressed (all information may be saved in one file)

1.2 Structure

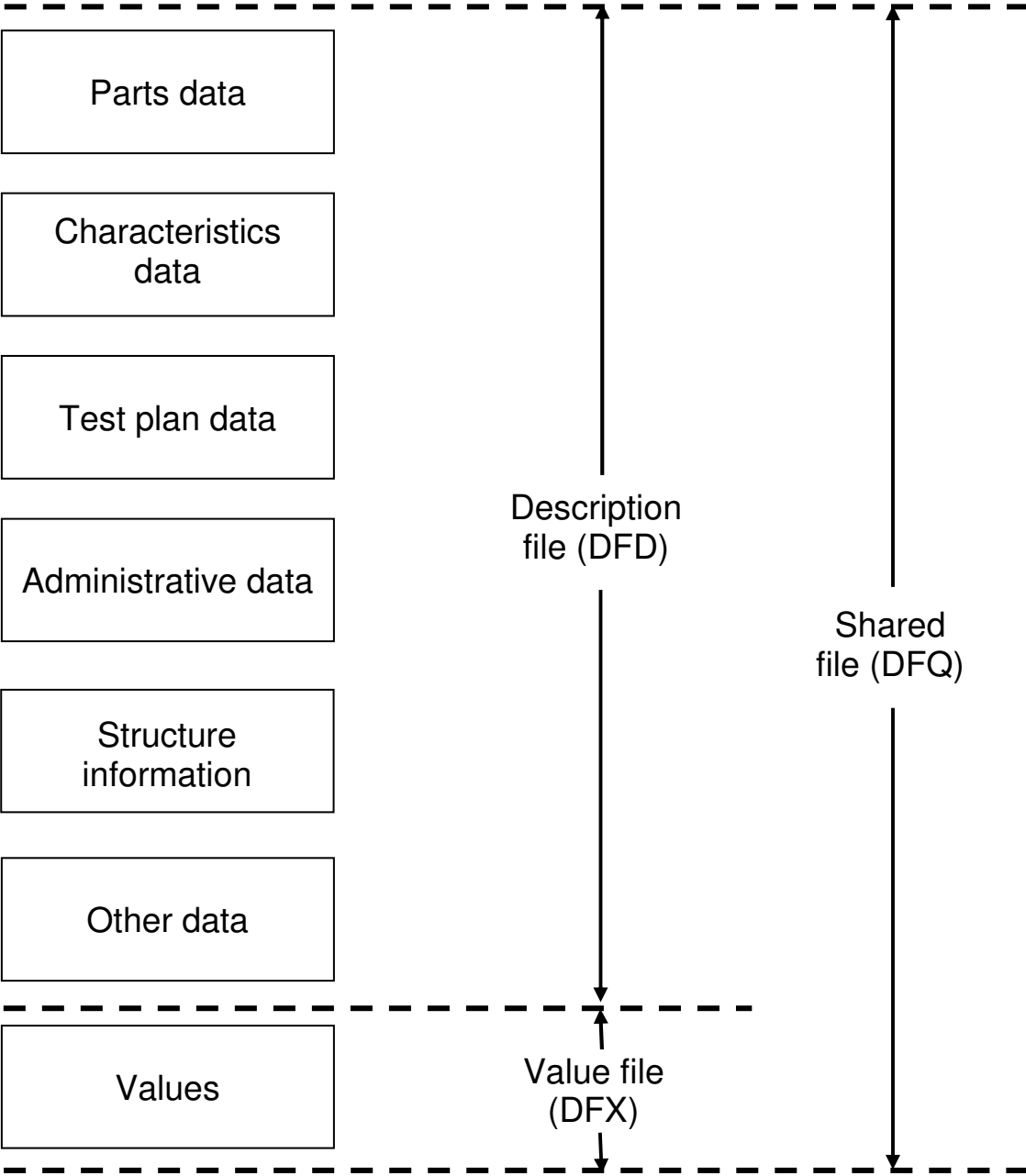
The data format is composed of 2 parts:

- descriptive data and
- value data

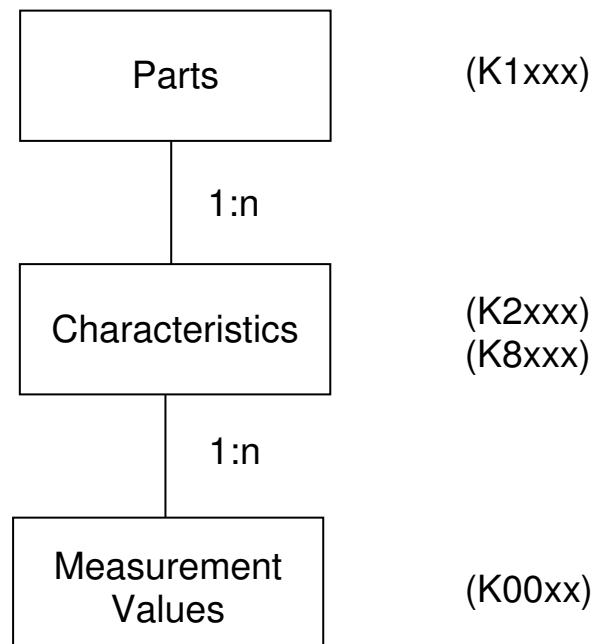
located either in 2 separate files or in one shared file. All 3 files carry the same file name, differentiated however by the file extension. The file extensions are as follows:

- shared file: *.DFQ
- value file: *.DFX
- description file: *.DFD

File structure:

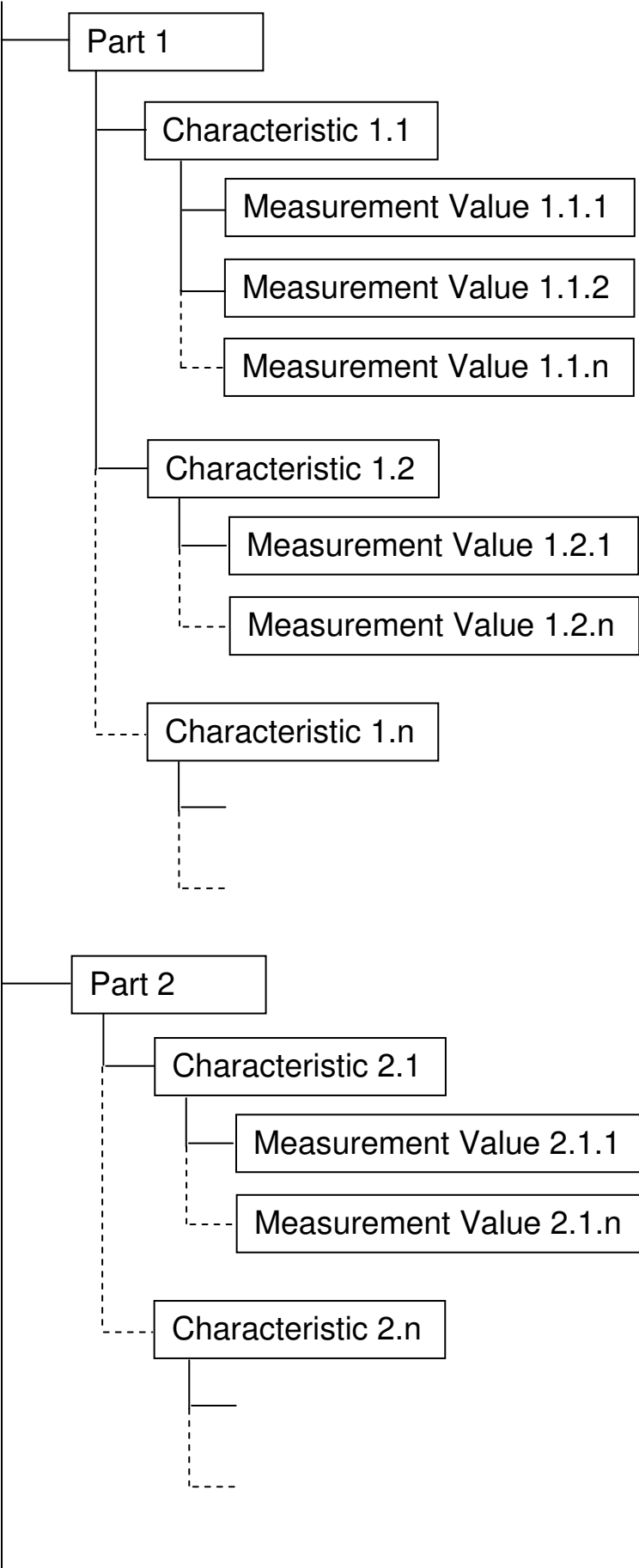


Data model:



Kxxxx: Key for the characteristics definition of an element

Example (tree structure):



2 Descriptive Portion

2.1 Key Fields

All descriptive data starts off with a **Key Field (K Field)**, which ensures the allocation of the contents.

A summary of the supported fields together with information regarding field type and the maximum length of the field contents is located in the appendix. The currently valid list will be published on the Q-DAS[®] website.

The fields are structured as follows:

K0001	...	K0999	Description of value formats /measurem. values
K1000	...	K1999	Parts data
K2000	...	K2999	Characteristics data
K3000	...	K3999	Test plan data
K4000	...	K4999	Administrative data
K5000	...	K5999	Structure information
K6000	...	K7999	reserved
K8000	...	K8999	QCC
K9000	...	K9999	Additional data
K10000	...	K32000	reserved

General notation regulations:

- Key number and field contents are separated by a space.
- One field is written per line.
- As line-end identification the combination of <CR><LF> (Hexadecimal \$0D \$0A), (Decimal #13 #10) is to be used.

Mandatory fields:

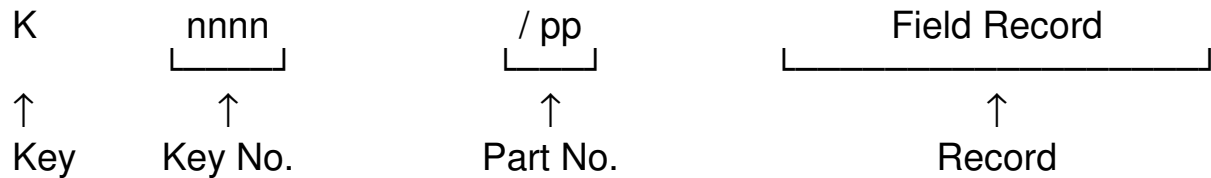
The following fields must be included in the data format in order to explicitly identify data sets.

- K0100 Total number of characteristics in the file
- K1001 Part number
- K1002 Part description
- K2001 Characteristics number
- K2002 Characteristics description

2.2.2 Parts Data (K1xxx)

The parts data of a part is located in a block before the corresponding characteristics data. This data is written in the following pattern:

Field structure for parts data



The following regulations apply:

- Parts No.: sequential, numerical part numbers in ascending order by sequence in the data set
- If the data set contains one part only, the / and the sequential parts number can be omitted.
- Ascending sequence of the K-fields within a block for one characteristic

Example:

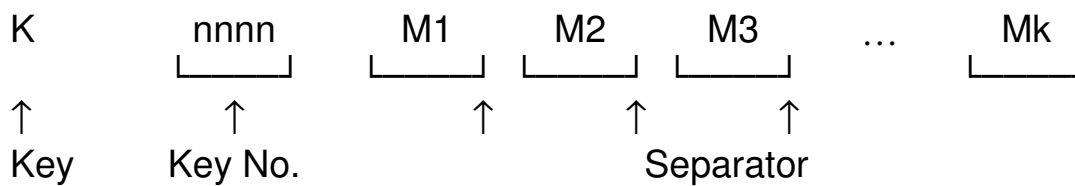
K1001 T4711	{Parts number}
K1002 Screw	{Parts description}
K1052 Q-DAS GmbH	{Customer}

2.2.3 Characteristics Data (K2xxx)

The characteristics data of a part is located after the corresponding parts data. The data of one field may be written for several characteristics in one line or on several lines. The following structure must be adhered to:

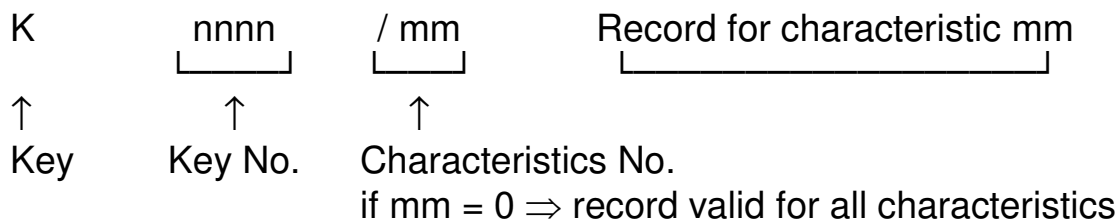
Field structure for characteristics data

Variant 1:



The ASCII character \$0F (Alt 015, „ α “) is used as a **separator** between the different characteristics records.

Variant 2:



The following regulations apply:

- Characteristic No.: sequential, numerical characteristics numbers in ascending order by sequence in the data set
- Ascending sequence of the K-fields within a block for one characteristic
- if multiple records for one characteristic are recorded on one line (variant 1 (no indication of characteristics description)), then the record must be entered consecutively for the characteristics and spaces must be filled in by a corresponding number of separators
- however, separators at the end are not necessary (**except for the line-end identification**)
- it is possible to overwrite records by using variants 1 and 2
- if the value “0” is recorded as characteristics number (mm), then this record is valid for all characteristics.

If equal key fields are used for the characteristics in one set of data, the last record loaded will be used until it is overwritten.

Example:

K2001 M1-D□M2-L	{Characteristics number characteristic 1/2}
K2002 Diameter□Length	{Characteristics description characteristic 1/2}
K2101/1 20	{Nominal characteristic 1}
K2110/1 19.6	{Lower specification limit MM 1}
K2111/1 20.4	{Upper specification limit MM 1}
K2142/0 mm	{Unit (/0 = valid for all characteristics)}
K2101/2 50	{Nominal characteristic 2}
K2110/2 49.5	{Lower specification limit MM 2}
K2111/2 50.5	{Upper specification limit MM 2}

2.2.4 Test Plan Data (K3xxx)

Test plan data currently contain data fields for the Initial Sample Report.

2.2.5 Administrative Data (K4xxx)

2.2.5.1 Catalogs

Some K fields point to catalog records. It is possible to administer catalogs in a separate catalog file or to integrate them into the descriptive portion.

At this time, a catalog record is composed of 2 fields only (number and description). Catalog records may be located at any random position. The catalogs will be extended by this record every time a catalog record is loaded.

Sub-catalogs (= groupings) may be created within a catalog, i.e. it is possible to combine records from an overall catalog into groups. This may be used, for example, to make parts of the overall catalog accessible to certain users or inaccessible to others. These sub-catalogs may be saved characteristics related. At this time, it is only possible to create sub-catalogs for the additional data fields "Events" and "Process Parameter".

Structure:

The grouping feature slightly changes the meaning of the format key/no. (Kxxxx/y). **The number following the slash (/y) no longer references the characteristics number in the scope of the catalog fields**, but receives a special meaning depending on the key.

- Kxxx0 / y z
Listing of sub-catalogs
z: Naming of the sub-catalog (= Naming of the group),
y: Sub-catalog number
- Kxxx1 / y z
Allocation catalog record <-> sub-catalog
z: Catalog record key,
y: Sub-catalog number (s. Kxxx0)
- Kxxx2 / y z
1. Catalog record component
z: Field record, i.e. event number, operator number
y: Catalog record key (s. Kxxx1)
- Kxxx3 / y z
2. Catalog record component
z: Field record, i.e. event text, operator number
y: Catalog record key (s. Kxxx1)

Catalog fields

A list of individually definable catalogs may be found in the appendix.

Example Customer Catalog:

Tabular list of catalog entries:

Key /x	Customer number K4002	Customer name K4003
1	4711	Smithson Inc.
2	4712	Johnson Corp.
3	4713	Example Inc.

Presentation in the data format:

K4000/0 Customer catalog	{Name of the customer catalog}
K4002/1 4711	{customer no. of the 1. catalog record}
K4003/1 Smithson Inc.	{customer name of the 1. cat. record}
K4002/2 4712	{customer no. of the 2. catalog record}
K4003/2 Johnson Corp.	{customer name of the 2. cat. record}
K4002/3 4713	{customer no. of the 3. catalog record}
K4003/3 Example Inc.	{customer name of the 3. cat. record}

Each catalog entry consists of the K4002 (customer number) and K4003 (customer name) field pair which are each identified by a unique number (/x). This number serves for referencing to the catalog entries.

Example Events Catalog:

Tabular list of records in the complete catalog:

Key /x	Event number K4222	Event text K4223
1	E1001	Tool breakage
2	E1002	Tool wear
3	E1003	Operator change
4	E1004	Pressure increase

Allocation if main catalog records to sub-catalogs:

Sub- catalog /x	Main cat. record K4221	Remark
1	1	Allocation "E1001" to Sub-cat. 1
1	2	Allocation "E1002" to Sub-cat. 1
2	3	Allocation "E1003" to Sub-cat. 2
2	4	Allocation "E1004" to Sub-cat. 2

Presentation in the data format:

K4220/0 Events – Main catalog	{Name of the complete catalog (/0)}
K4222/1 E1001	{Event no. of the 1. cat. record}
K4223/1 Tool breakage	{Text of the 1. catalog record}
K4222/2 E1002	{Event no. of the 2. cat. record}
K4223/2 Tool wear	{Text of the 2. catalog record}
K4222/3 E1003	{Event no. of the 3. cat. record}
K4223/3 Operator change	{Text of the 3. catalog record}
K4222/4 E1004	{Event no. of the 4. cat. record}
K4223/4 Pressure increase	{Text of the 4. catalog record}
K4220/1 Events Sub-catalog 1	{Name of the first sub-cat. (/1)}
K4220/2 Events Sub-catalog 2	{Name of the second sub-cat. (/2)}
K4221/1 1	{Allocation of the first and second cat. record to the sub-catalog 1 (/1)}
K4221/1 2	
K4221/2 3	{Allocation of the third and fourth cat. record to the sub-catalog 1 (/1)}
K4221/2 4	

Special Case Process Parameter Catalog:

Tabular list of process parameters:

Key /x	Number K4242	Name K4243	Abbreviation K4244
1	PP1001	Flow	cubicm/h
2	PP1002	Switch cooling	SK
3	PP1003	Process parameter 3	PP3
4	PP1004	Process parameter 4	PP4

Tabular List of process parameter values:

Key /x	Number K4245	Name K4246
1	D1	Minimum
2	D2	Normal
3	D3	Maximum
4	SK1	On
5	SK2	Off
6	SK3	Automatic
:	:	:

Allocation of process parameter values to process parameters (PP):

PP /x	PP-Value K4249	Remark
1	1	Allocation of "D1" to "PP1001"
1	2	Allocation of "D2" to "PP1001"
1	3	Allocation of "D3" to "PP1001"
2	4	Allocation of "SK1" to "PP1002"
2	5	Allocation of "SK2" to "PP1002"
2	6	Allocation of "SK3" to "PP1002"
:	:	:

Presentation in the data format:

K4240/0 Process parameter cat.	{Name of the (main) catalog}
K4242/1 PP1001	{No. of the 1. Process parameter}
K4243/1 Flow	{Text of the 1. Process parameter}
K4244/1 m ³ /h	{Abbrev. 1. Process parameter}
K4242/2 PP1002	{No. of the 2. Process parameter}
K4243/2 Switch cooling	{Text of the 2. Process parameter}
K4244/2 SK	{Abbrev. 2. Process parameter}
K4242/3 PP1003	{No. of the 3. Process parameter}
K4243/3 Process parameter 3	{Text of the 3. Process parameter}
K4244/3 PP3	{Abbrev. 3. Process parameter}
K4242/4 PP1004	{No. of the 4. Process parameter}
K4243/4 Process parameter 4	{Text of the 4. Process parameter}
K4244/4 PP4	{Abbrev. 4. Process parameter}
K4245/1 D1	{No. of 1. Process parameter value}
K4246/1 Minimum	{Text of 1. PP-Value}
K4245/2 D2	{No. of 2. Process parameter value}
K4246/2 Normal	{Text of 2. PP-Value}
K4245/3 D3	{No. of 3. Process parameter value}
K4246/3 Maximum	{Text of 3. PP-Value}
K4245/4 SK1	{No. of 4. Process parameter value}
K4246/4 On	{Text of 4. PP-Value}
K4245/5 SK2	{No. of 5. Process parameter value}
K4246/5 Off	{Text of 5. PP-Value}
K4245/6 SK3	{No. of 6. Process parameter value}
K4246/6 Automatic	{Text of 6. PP-Value}
:	
K4249/1 1	{Allocation of the process parameter values "D1", "D2" and "D3" to 1.
K4249/1 2	Process parameter "PP1001"}
K4249/1 3	
K4249/2 4	{Allocation of the process parameter values "SK1", "SK2" and "SK3" to 2.
K4249/2 5	Process parameter "PP1002"}
K4249/2 6	
:	

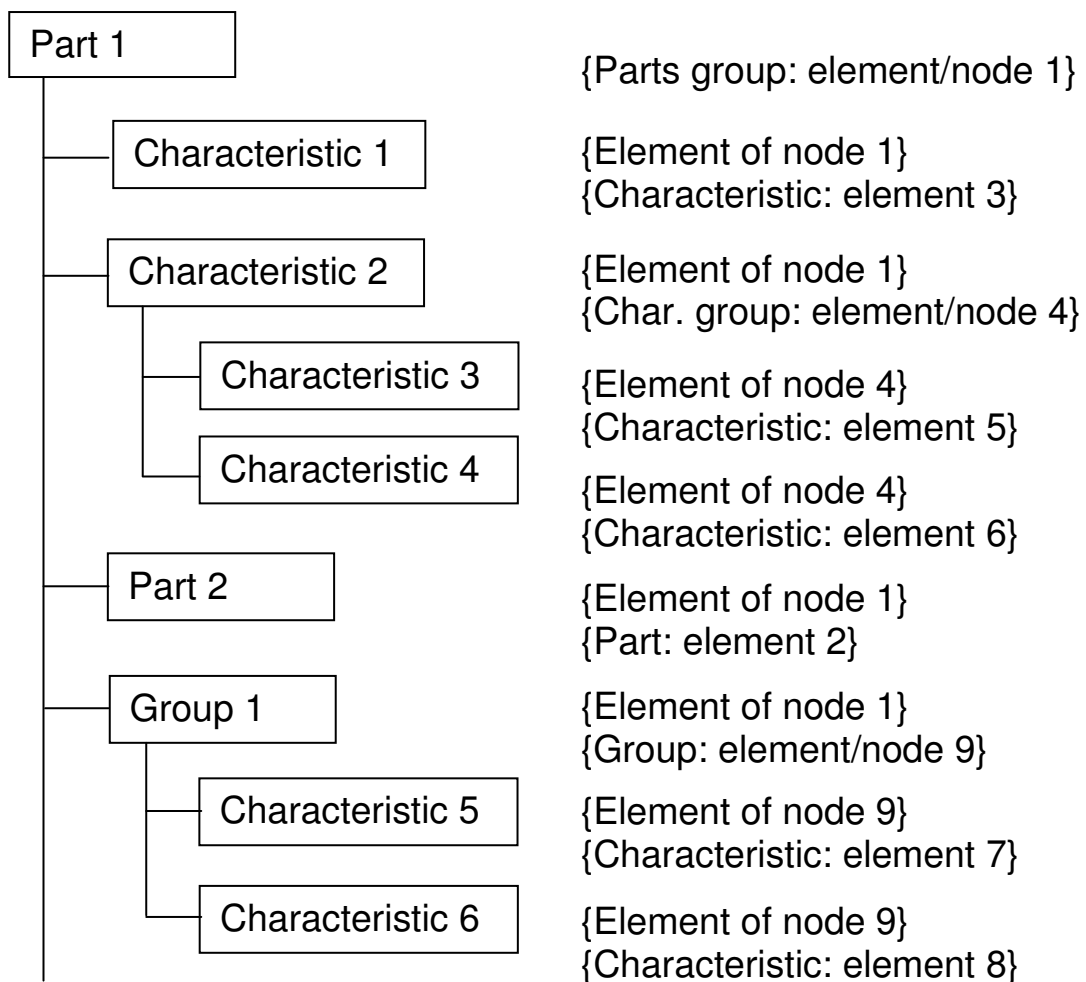
2.2.6 Structural Information (K5xxx)

In order to create a data hierarchy, groups containing subordinate elements can be built. Groupings are relevant, for example, in case of positional tolerances, error log sheet or measurement uncertainty studies. (Support of K5xxx from qs-STAT millennium and up.)

The grouped characteristics should be written in the sequence according to their grouping structure that means in the sequence superimposed characteristic – sub-ordinate characteristics.

2.2.6.1 Definition of Terms

The following sample tree structure assists in defining the used terms.



- Each record in the tree is called an **Element**.
- Three element types are defined: **parts**, **characteristics** and **groups**.
- A **Group** is an element, which is neither part nor characteristic, may contain subordinate elements and is only created as a logical group.
- An element which contains subordinate elements is also called a **Node**.
- A node with the attributes of a part is called a **Parts Group**.
- A node with the attributes of a characteristic is called a **Characteristics Group**.

2.2.6.2 Display of the Data Format Structures

Step 1: Element Definition

The fields K511x stipulate the types of elements and nodes:

K5111 -> Part element (element/node is a part or Parts Group)

K5112 -> Characteristic element (element/node is a characteristic or Characteristic Group)

K5113 -> Group element (element/node is a group)

K	<u>511x</u>	<u>/ k</u>	<u>mm</u>
↑	↑	↑	↑
Key	Key No.	Element No.	Seq. parts/characteristics/group number

The types of all elements have to be defined.

Examples:

K5111/1 1	{Element 1 is part 1}
K5112/2 2	{Element 2 is characteristic 2}
K5113/3 1	{Element 3 is group 1}

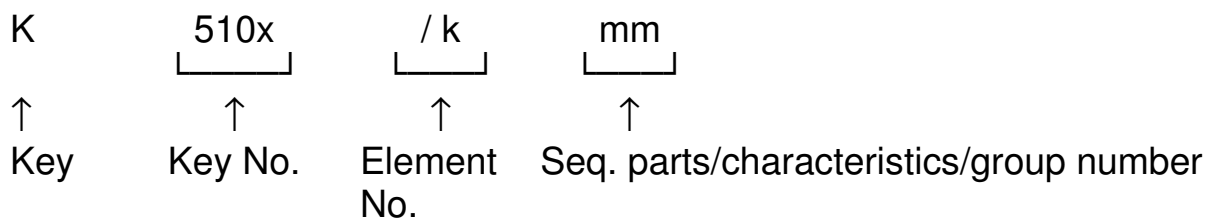
Step 2: Element Allocation to Nodes

The fields K510x allocate elements to the stipulated nodes (node K contains element Y):

K5101 -> part is an element of the node

K5102 -> characteristic element is an element of the node (end of level)

K5103 -> node (any group type as subordinate group) is an element of the node



Examples:

K5101/1 2	{Node 1 contains part 2}
K5102/2 3	{Node 2 contains characteristic 3}
K5103/1 3	{Node 1 contains node element 3}

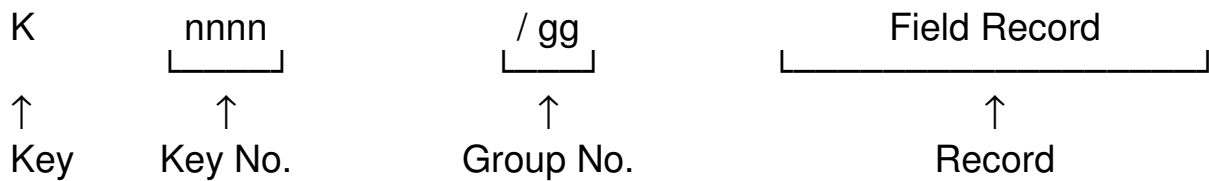
General rules:

- **The number following the slash (/k) no longer refers to the sequential characteristics number but rather the element number.**
- The element number is a consecutive numerical number.
- The sequential numbering of elements is carried out from left to right (primary) and from up to down (secondary) (start the element numbering for all parts, then all characteristics, then all groups).
- Flat hierarchies (parts and x-characteristics on the same level) do not require additional structural information. Only if two or more levels exist, then the structural key fields must be saved.

2.2.6.3 Fields with Further Element- and Structural Information

Elements which are neither part nor characteristic (logical groups), receive individual K fields corresponding to parts and characteristics data (K5000 – K5099; see field list in the appendix).

Field structure for group data

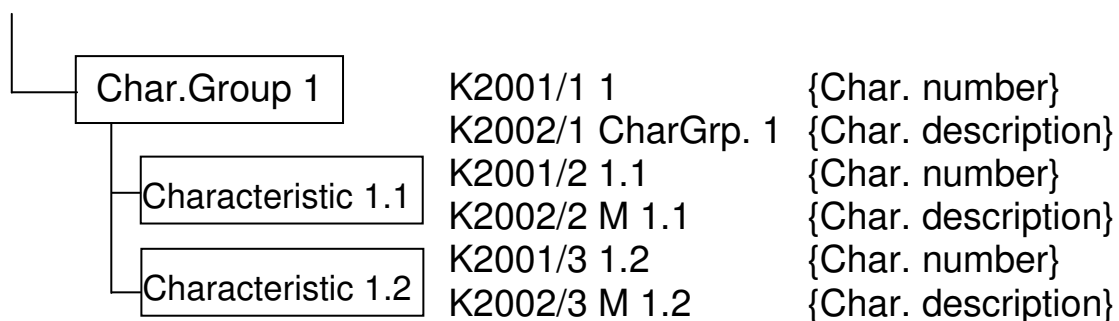
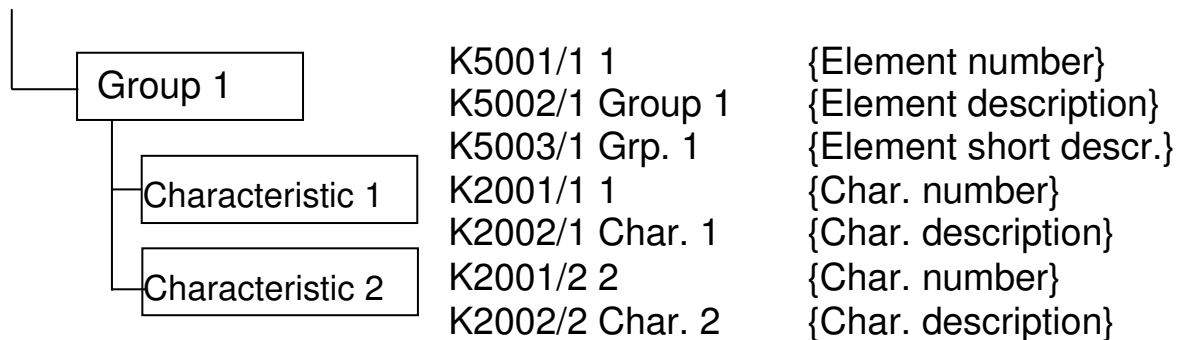


The following regulations apply:

- Group No.: sequential, numerical group numbers in ascending order by sequence in the data set
- Ascending sequence of the K-fields within a block for one group

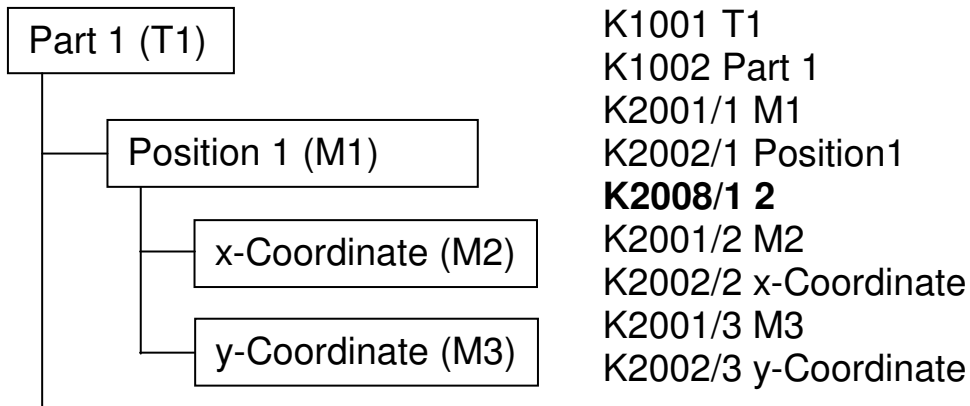
If parts or characteristics contain subordinate elements, this additional information may be neglected (not mandatory).

Examples:



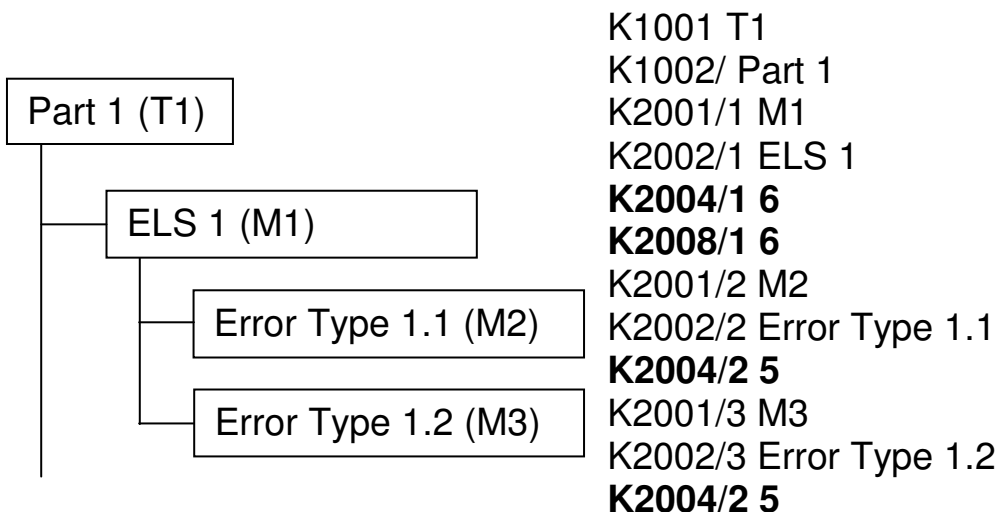
2.2.7 Special Characteristic Structures

2.2.7.1 Group Type Positional Tolerances



The characteristics must be built up hierarchically with the help of the grouping mechanisms of the data format (K5xxx). For simple groupings, K-fields K2030 / K2031 can be used also.

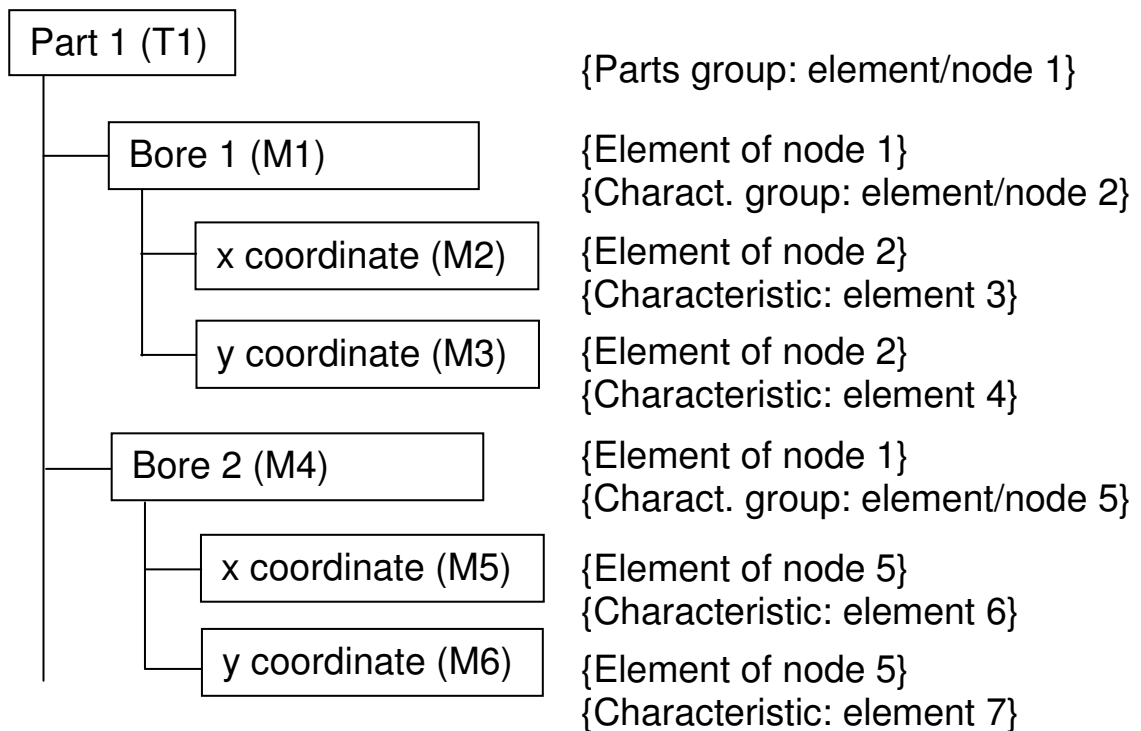
2.2.7.2 Group Type Error Log Sheet



The characteristics must be built up hierarchically with the help of the grouping mechanisms of the data format (K5xxx). For simple groupings, K-fields K2030 / K2031 can be used also.

2.2.7.3 Structure Information for Positional Tolerances

The following example shows in a tree diagram is the data structure as it could be displayed for the evaluation of bore centers. The required K fields are listed below.



Characteristics related listing of the Group Type (K2008) field contents:

Bore 1 (M1)	K2008/1 2
x-Coordinate (M2)	K2008/2 0
y-Coordinate (M3)	K2008/3 0
Bore 2 (M4)	K2008/4 2
x-Coordinate (M5)	K2008/5 0
y-Coordinate (M6)	K2008/6 0

Listing of the field contents for structural information:

K5111/1 1 {element/node 1 is part 1}
 K5112/2 1 {element/node 2 is sequential characteristic 1 (Bore 1)}
 K5112/3 2 {element 3 is sequential characteristic no 2 (x coordinate)}
 K5112/4 3 {element 4 is sequential characteristic no 3 (y coordinate)}
 K5112/5 4 {element/node 5 is characteristic 4 (Bore 2)}
 K5112/6 5 {element 6 is sequential characteristic no 5 (x coordinate)}
 K5112/7 6 {element 7 is sequential characteristic no 6 (y coordinate)}

K5103/1 2 {node 1 includes node 2 (characteristics group Bore 1)}
 K5103/1 5 {node 1 includes node 5 (characteristics group Bore 2)}

K5102/2 2 {node 2 includes seq. characteristic no. 2 (x coordinate)}
 K5102/2 3 {node 2 includes seq. characteristic no. 3 (y coordinate)}

K5102/5 5 {node 5 includes seq. characteristic no. 5 (x coordinate)}
 K5102/5 6 {node 5 includes seq. characteristic no. 6 (y coordinate)}

The two tables below are helpful for the display of the structural information.

Table 1 documents which type of element is used (element is a part, element is a characteristic, element is a group):

Node /x	Part K5111	Char. K5112	Group K5113	Remark
1	1	-	-	Element 1 is part 1
2	-	1	-	Element 2 is characteristic 1
3	-	2	-	Element 3 is characteristic 2
4	-	3	-	Element 4 is characteristic 3
5	-	4	-	Element 5 is characteristic 4
6	-	5	-	Element 6 is characteristic 5
7	-	6	-	Element 7 is characteristic 6

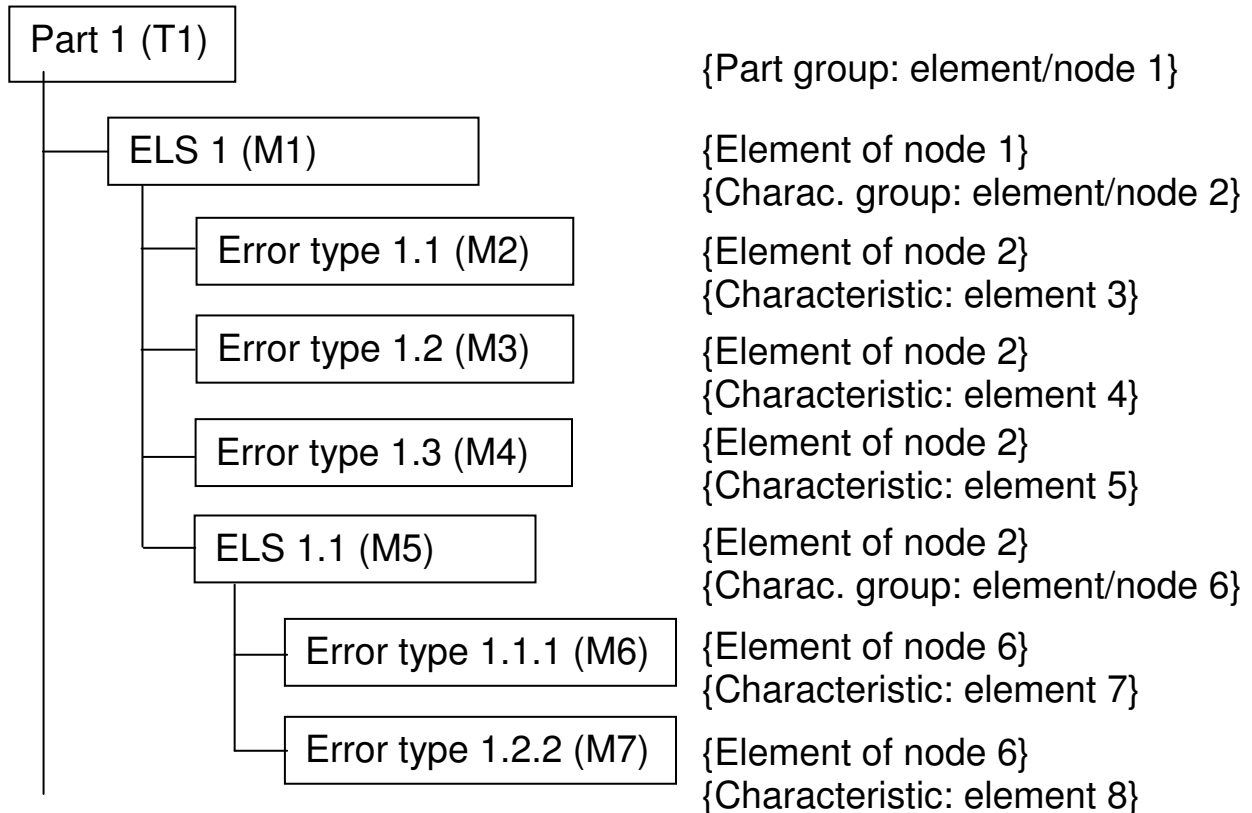
Table 2 shows the allocation of the elements to the nodes (node x includes element y):

Node /x	Part K5101	Char. K5102	Node K5103	Remark
1	-	-	2	Node 1 includes node 2
1	-	-	5	Node 1 includes node 5
2	-	2	-	Node 2 includes characteristic 2
2	-	3	-	Node 2 includes characteristic 3
5	-	5	-	Node 5 includes characteristic 5
5	-	6	-	Node 5 includes characteristic 6

The required K fields may be easily derived with the help of these tables.

2.2.7.4 Structure Information for Multi-Stage ELS

The example shows a structure with interlocked error log sheets (ELS). In this case, the ELS is the sum of all subordinate error types and another subordinate ELS. The subordinate ELS passes results on the higher-ranking ELS.



K5111/1 1	{element/node 1 is part 1}
K5112/2 1	{element/node 2 is sequential characteristic no. 1 (ELS 1)}
K5112/3 2	{element 3 is seq. characteristic no. 2 (Error type 1.1)}
K5112/4 3	{element 4 is seq. characteristic no. 3 (Error type 1.2)}
K5112/5 4	{element 5 is seq. characteristic no. 4 (Error type 1.3)}
K5112/6 5	{element/node 6 is seq. characteristic no. 5 (ELS 1.1)}
K5112/7 6	{element 7 is seq. characteristic no. 6 (Error type 1.1.1)}
K5112/8 7	{element 8 is seq. characteristic no. 7 (Error type 1.2.2)}

K5103/1 2	{node 1 includes node 2 (characteristics group ELS 1)}
K5103/2 6	{node 2 includes node 6 (ELS 1.1)}

K5102/2 2	{node 2 includes seq. characteristic 2 (error type 1.1)}
K5102/2 3	{node 2 includes seq. characteristic 3 (error type 1.2)}
K5102/2 4	{node 2 includes seq. characteristic 4 (error type 1.3)}

K5102/6 6 {node 6 includes seq. characteristic 6 (error type 1.1.1)}
 K5102/6 7 {node 6 includes seq. characteristic 7 (error type 1.1.2)}

The two tables below are helpful for the display of the structural information.

Table 1 documents which type of elements is used (element is a part, element is a characteristic, element is a group):

Node /x	Part K5111	Char. K5112	Group K5113	Remark
1	1	-	-	Element 1 is part 1
2	-	1	-	Element 2 is characteristic 1
3	-	2	-	Element 3 is characteristic 2
4	-	3	-	Element 4 is characteristic 3
5	-	4	-	Element 5 is characteristic 4
6	-	5	-	Element 6 is characteristic 5
7	-	6	-	Element 7 is characteristic 6
8	-	7	-	Element 8 is characteristic 7

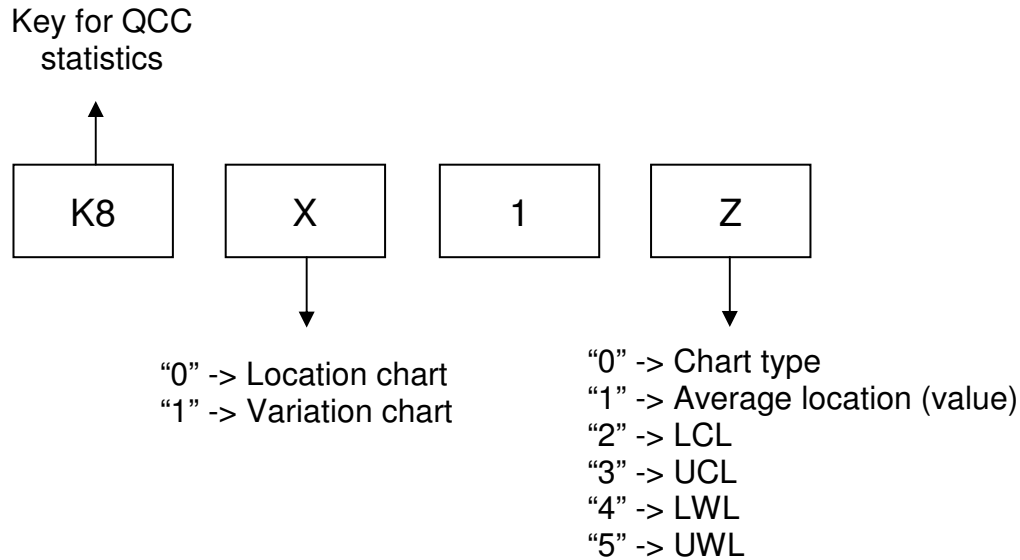
Table 2 shows the allocation of the elements to the nodes (node x includes element y):

Node /x	Part K5101	Char. K5102	Node K5103	Remark
1	-	-	2	Node 1 includes node 2
2	-	2	-	Node 2 includes characteristic 2
2	-	3	-	Node 2 includes characteristic 3
2	-	4	-	Node 2 includes characteristic 4
2	-	-	6	Node 2 includes node 6
6	-	6	-	Node 3 includes characteristic 6
6	-	7	-	Node 3 includes characteristic 7

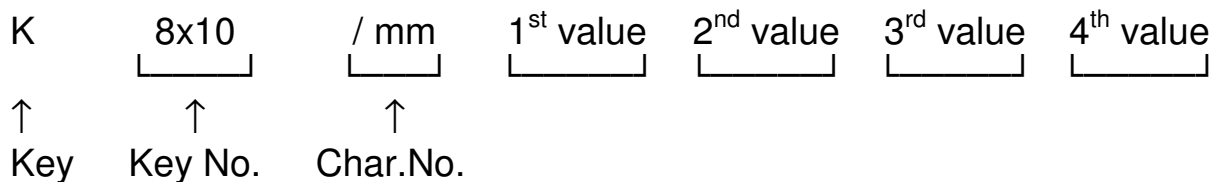
The required K fields may be easily derived with the help of these tables.

2.2.8 Quality Control Charts (K8xxx)

The key number for quality control charts (QCC) is structured as seen below:



The chart type field is structured as detailed below:



Remark: Missing additional attributes are added in by the program with the default settings!!

2.2.8.1 Additional attributes for Location Charts (K80xx)

Location chart type (1st value)

	Acceptance chart	Shewhart			Pearson		
		99%	99,73%	User	99%	99,73%	User
Raw value	10	11	12	13	16	17	18
Median value	20	21	22	23	26	27	28
Average value	30	31	32	33	36	37	38

Additional attribute of variation estimator (**2nd value**):

- 1 → $\sigma[1] \leftarrow \sqrt{(\sum s^2/k)}$
- 2 → $\sigma[2] \leftarrow (\sum s/k)/a[n]$
- 3 → $\sigma[3] \leftarrow (\sum R/k)/d[n]$
- 4 → $\sigma[4] \leftarrow s[\text{tot}]$
- 6 → $\sigma[6] \leftarrow \text{Target value}$
- 7 → $\sigma[7] \leftarrow \text{Standard deviation of the averages}$
- 8 → $\sigma[8] \leftarrow \text{Standard deviation of the Median values}$

Additional attribute of extended limits (**3rd value**):

- 0 → no extended limits
- 1 → lower/upper value of the variation range of the average is recorded
- 2 → variation range of the average from Analysis of Variance
- 3 → calculation over the total variation of the calculated values
- 4 → calculation over $X[\text{add}]$
- 5 → input of control limits

Additional attribute of Pearson calculation (**4th value**):

- 0 → no calculation according to Pearson
- 1 → variation, skewness and excess of the subgroup statistics are calculation from skewness and excess of the individual values
- 2 → calculation is carried out with the help of variation, skewness and excess of the subgroup statistics (subgroup averages or subgroup Median values). For Median value charts according to Pearson this is the only possibility that exists. For raw value charts according to Pearson, this is the only possibility that exists.

Additional attribute lower limit μ_{lo} of the extension range (**5th value**; only for location charts with extended control limits)

Additional attribute upper limit μ_{up} of the extension range (**6th value**; only for location charts with extended control limits)

Additional attribute error proportion P for acceptance charts (**7th Value**; only for acceptance charts)

Additional attribute $1-P(\alpha)$ interference probability for acceptance charts (**8th Value**; only for acceptance charts)

Additional attribute factor $1-\alpha$ for the expansion of the extension range (**9th Value**; only for location charts with extended limits)

Additional attribute estimator for μ (**10th Value**):

$$1 = \hat{\mu}_1; \quad 2 = \hat{\mu}_2; \quad 3 = \hat{\mu}_3; \quad 4 = \hat{\mu}_4$$

Additional attribute stability level (**11th Value**):

$$0 = \text{Level 0}; \quad 1 = \text{Level 1}; \quad 2 = \text{Level 2}$$

2.2.8.2 Additional attribute for Variation Charts (K81xx)

Variation chart type (**1st value**)

	Shewhart			QS-9000 *		Pearson		
	99%	99,73%	User	$\pm 2,58 \sigma$	$\pm 3 \sigma$	99%	99,73%	User
S chart	51	52	53	54	55	56	57	58
R chart	61	62	63	64	65	66	67	68

* of the individual statistical distribution

$$1 \rightarrow \sigma[1] \leftarrow \sqrt{(\sum s^2/k)}$$

$$2 \rightarrow \sigma[2] \leftarrow (\sum s/k)/a[n]$$

$$3 \rightarrow \sigma[3] \leftarrow (\sum R/k)/d[n]$$

$$4 \rightarrow \sigma[4] \leftarrow s[\text{ges}]$$

$$6 \rightarrow \sigma[6] \leftarrow \text{Target Value}$$

$$7 \rightarrow \sigma[7] \leftarrow \text{Standard deviation of the averages}$$

$$8 \rightarrow \sigma[8] \leftarrow \text{Standard deviation of the Median values}$$

Additional attribute stability level (**3rd Value**):

$$0 = \text{Level 0}; \quad 1 = \text{Level 1}; \quad 2 = \text{Level 2}$$

Charts for attribute characteristics (1st Value)

		Exact calculation			QS-9000*	
		99 %	99,73 %	User	$\pm 2,58 \sigma$	$\pm 3 \sigma$
Binomial Distribution	p chart	111	112	113	114	115
	x chart	121	122	123	-	-
	np chart	-	-	-	124	125
Poisson Distribution	p chart	211	212	213	-	-
	u chart	-	-	-	214	215
	x chart	221	222	223	-	-
	c chart	-	-	-	224	225

Examples:

Location chart:

K8010/1 32 4 0 0 {Average chart acc. to Shewhart (99,73%)/ $s_{(tot)}$ }
 K8011/1 130.03917 {Average location of the location chart }
 K8012/1 130.00221 {Lower control limit of the location chart }
 K8013/1 130.07614 {Upper control limit of the location chart }

Variation chart:

K8110/1 54 4 {s chart acc. to QS-9000 ($\pm 2,58 \sigma$)/ $s_{(tot)}$ }
 K8111/1 0.0312637 { Average location of the variation chart }
 K8112/1 0.0036891 { Lower control limit of the variation chart }
 K8113/1 0.0588383 { Upper control limit of the variation chart }

Example Location chart with extended limits:

Average chart according to Shewhart with a probability for non-conformance of 99.73% (1st value: 32); variation estimator σ_1 (2nd Value: 1); variance analytical determination of the extension of the control limits (3rd limit: 2); no calculation according to Pearson (4th value: 0); lower limit of the extension range (5th value: 19.9925); upper limit of the extension range (6th value: 20.0166); no additional attributes for acceptance chart (7th and 8th value: 0); factor for the expansion of the control limits 86.64% (9th value: 0.866386)

K8010/1 32 1 2 0 19.9925 20.0166 0 0 0.866386 {Chart type}
 K8011/1 20.004532 {Average location}
 K8012/1 19.979505051 {Lower control limit}

K8013/1 20.029558959

{Upper control limit }

Example Acceptance Location Chart:

Averages Acceptance Chart (1st value: 30); variation estimator σ_1 (2nd value: 1); no extended limits (3rd value: 0); no calculation according to Pearson (4th value: 0); no extension range (5th and 6th value: 0); parameter error proportion 5% (7th value: 0.05); interference probability of 90% (8th value: 0.9)

K8010/1 30 1 0 0 0 0 0.05 0.9

{Chart type}

K8011/1 130.075

{Average location}

K8012/1 129.969541

{Lower control limit }

K8013/1 130.180459

{Upper control limit }

2.2.9 Additional Data (K9xxx)

“Additional Data” is not supported at this time.

3 Value Portion

Apart from the actual measurement value, the value record for a characteristic may be composed of the following components:

- Measurement value (variable, attribute)
- Attribute
- Date/Time
- Batch number
- Events
- Nest number
- Operator
- Text
- Machine
- Gage
- Process parameter
- ...

The data can be written by the line in a set order or by using the corresponding K fields (K00xx; see field list in the appendix). A combination of the two notations is also possible.

3.1 Structure of the Value Portion

3.1.1 Notation without the use of K Fields

3.1.1.1 Measurement Values

For notation by the line, the first measurement values of all characteristics and parts are recorded on the first line. The values of the second measurement follow on the second line etc. The characteristics are separated by separators (ASCII #15, "□", Hex\$0F). When saving several parts, the sequence of the parts should be equal to that in the descriptive portion.

	Part 1			Part 2		
	Values Characteristic 1	...	Values Characteristic n	Values Characteristic n+1	...	Values Characteristic n+m
1 st Value						
2 nd Value						
:						
n th Value						

With regard to the characteristics values, they are differentiated between different characteristics types (variable, attribute). The allocation of the values, as values of a certain characteristics type, is carried out automatically through the characteristics type (K2004) indicated in the characteristics description. Depending on the characteristics type, some of the values may be composed of several records separated by separators (ASCII #20, “¶”, Hex\$14).

Values characteristics type variable:	
Value	

Values characteristics type attribute:	
Subgroup size (x 1000)¶Number of errors¶0¶	

3.1.1.2 Additional Data

The input of further additional information for the values (attribute, time, events, batch number, etc.) is optional. If these components are recorded, then they must be written in a fixed sequence after the corresponding measurement value and be separated by additional separators (ASCII #20, “¶”, Hex\$14). The **batch number must also be identified by the character “#”**.

Ascending Sequence Additional Data:

```

Value
Value¶Attribute
Value¶Attribute¶Date/Time
Value¶Attribute¶Date/Time¶Events
Value¶Attribute¶Date/Time¶Events¶Batch number...
```

Sequence:

- 1 Value,
- 2 Attribute,
- 3 Date/Time,
- 4 Events,
- 5 Batch number,
- 6 Nest number,
- 7 Operator number,
- 8 Machine number,
- 9 Process parameter,
- 10 Gage number.

Further fields for the additional information (optional) may be recorded through the K fields in the following line.

3.1.1.3 Scope of Validity

As a general rule, records in the file are valid (i.e. are taken over) until they are replaced by new records.

Exceptions are the fields

- Flag
- Attribute
- Events
- Text
- Process parameter

It is a rule that these fields are never taken over from the previous record.

If no records are entered, the fields automatically receive the value 0, i.e. Attribute = 0 (valid value) respectively Event = 0 (no event recorded).

In order to end the takeover of records, the record "0" must be entered in numerical fields. An exception is the batch number, where the character "#" should be recorded.

The takeover rule described here is not applicable when K fields are used for the notation of the additional data.

3.1.1.4 Separators Summary

- Characteristics separator \$0F (hexadecimal) resp. #15 (decimal)
- Additional data separator \$14 (hexadecimal) resp. #20 (decimal)
- Line-end identification \$0D \$0A (hexadecimal), #13 #10 (decimal)
Combination from <CR><LF>

3.1.1.5 Example

The values of the 1st characteristic are recorded in the first column. Attribute, time/date, event, and batch number (marked with '#') are found in the columns 2-5, each divided by a separator for additional data fields (Hex\$14, Dez #20, "¶"). The second characteristic (and so on) follows after this, divided by a separator (Hex\$0F, Dez #15, "α"). The columns 2-5 are optional, i.e. they are not required. If these records are used, then the sequence must be strictly adhered to. The numerical values may also be written in decimal notation or exponential notation.

Note: Starting from measurement value 1.54 (8th measurement value) the batch number is no longer administered, which is indicated by the "#" character.

<----- Characteristic 1 ----->					<--- Characteristic 2 --->
1	2	3	4	5	6
8.38¶	0¶	12.03.98/14:12:35 ¶	0 ¶	#16777 α	2.566
1.34¶	0¶	12.03.98/14:12:57 ¶	0 ¶	#16777 α	1.811
1.50¶	0¶	12.03.98/14:15:12 ¶	0 ¶	#16777 α	2.113
1.34¶	0¶	12.03.98/14:15:46 ¶	0 ¶	#16777 α	2.264
8.38¶	0¶	12.03.98/14:18:32 ¶	0 ¶	#16777 α	2.415
9.22¶	0¶	12.03.98/14:19:14 ¶	0 ¶	#16777 α	1.811
8.38¶	0¶	12.03.98/14:21:06 ¶	0 ¶	#16777 α	1.509
1.54¶	0¶	12.03.98/14:21:59 ¶	0 ¶	#	α 1.811
1.34¶	0¶	12.03.98/14:23:22 ¶	0		α 1.962
1.50¶	0¶	12.03.98/14:25:04 ¶	0		α 1.811
1.34¶	0¶	12.03.98/14:26:31 ¶	0		α 1.509

Remark: Each line has to be provided with the line-end identification.

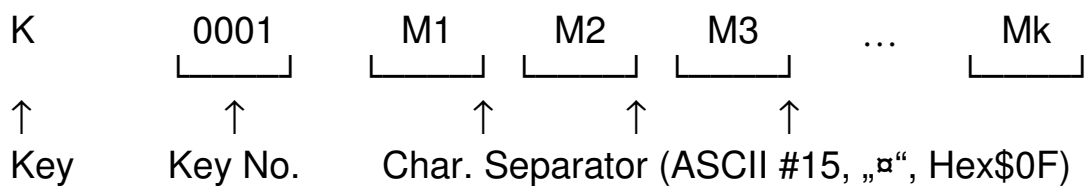
3.1.2 Notation using K Fields

As in the descriptive portion, the same rules apply to the notation when using K fields.

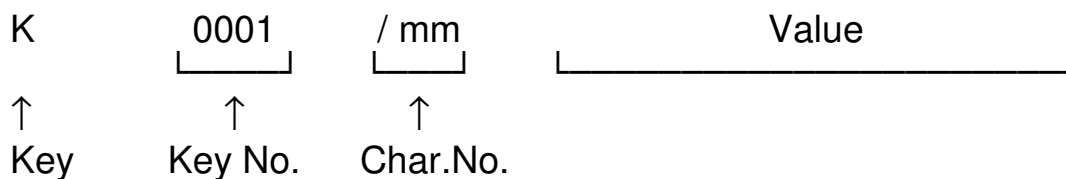
3.1.2.1 Measurement Values

The key number for values is K0001 (Field type: floating point number, maximum field length 22 bytes).

Variant 1:



Variant 2:

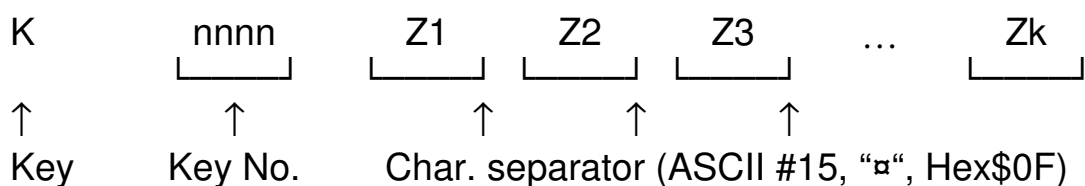


The notation K0001/0 (characteristics no. mm = 0) is not allowed!

3.1.2.2 Additional Data

A summary of the supported additional data fields is located in the appendix (K00XX). The currently valid version is available for download on the Q-DAS® website.

Variant 1:



Variant 2:

K	<u>nnnn</u>	/ mm	Record for Additional Data Field mm
↑	↑	↑	
Key	Key No.	Char.No.	

if mm = 0 ⇒ Record valid for all characteristics

The additional data of variants 1 or 2 follow the corresponding measurement values directly. If such a relation is not possible, then the additional data may be specifically allocated to certain values. In order to do this, the key number must be supplemented by the corresponding value number.

Variant 3:

K	<u>nnnn</u>	/ mm	/ww	Record for Additional Data Field
↑	↑	↑	↑	
Key	Key No.	Char. No.	Value No.	

3.1.2.3 Rules for the Notation using K Fields

- Numerical characteristics/value number
- If several records for one characteristic are collected on one line (Variant 1 (no record of characteristics description)), then the records must be written consecutively for the characteristics and spaces must be filled in with a corresponding number of separators.
- However, separators at the end are not necessary (**except for the line-end identification**)
- If the value "0" is recorded as characteristics number (mm), then this record is valid for all characteristics (exception K0001).
- The automatic takeover of additional data for following measurements does not take place that means the additional have to be written per measurement.

Records may be overwritten by using the variants 1, 2 and 3.

3.1.2.4 Examples

Variant 1:

K0001 19.8▫50.2	{first value characteristic 1/2}
K0004 17.06.01/13:08:34▫17.06.01/...	{date/time characteristic 1/2}
K0006 Batch0815▫Batch0815	{batch number characteristic 1/2}
K0001 20.1▫49.8	{second value characteristic 1/2}
K0004 17.06.01/13:15:10▫17.06.01/...	{date/time characteristic 1/2}
K0006 Batch0816▫Batch0816	{batch number characteristic 1/2}
:	

Variant 2:

K0001/1 19.8	{first value characteristic 1}
K0004/1 17.06.01/13:08:34	{date/time of measurement}
K0006/1 Batch0815	{batch number}
K0001/2 50.2	{first value characteristic 2}
K0004/2 17.06.01/13:08:56	{date/time of measurement}
K0006/2 Batch0815	{batch number}
K0001/1 20.1	{second value characteristic 1}
K0004/1 17.06.01/13:15:10	{date/time of measurement}
K0006/1 Batch0816	{batch number}
K0001/2 49.8	{second value characteristic 2}
K0004/2 17.06.01/13:15:43	{date/time of measurement}
K0006/2 Batch0816	{batch number}
:	

Variant 3 (Additional Data):

K0001 19.8▫50.2	{first value characteristic 1/2}
K0001 20.1▫49.8	{second value characteristic 1/2}
K0006/0/1 Batch0815	{batch number. first value all char.}
K0006/0/2 Batch0816	{batch no. second value all char.}

Mixed Notation (with and without K Fields):

19.8▫50.2	{first value characteristic 1/2}
K0006/0 Batch0815	{batch no. first value all char.}
20.1▫49.8	{second value characteristic 1/2}
K0006/0 Batch0816	{batch no. second value all char.}

3.1.3 Additional Data Particulars

3.1.3.1 Attribute

The attribute table must be referred to for the key K0002 (attribute).

Attribute	Explanation
0	The value is valid.
1	In "Reliability Analysis" this attribute marks a "non-defective part".
2 - 128	Internally used attributes with values eliminated manually or through outlier tests.
255	During data recording, in form of a table, an empty data field will be marked with this attribute.
256	Attribute of a value used only for filling up the file structure.
280	Re-work carried out, value OK, numerical value proof through qualitative procedure.
290	Non-plausible value (recognized during measurement)
	For Post Process Measurements:
300	Measurement value does not exist (synchronization of partial measurements)
301	Buffer value (moving subgroup size)
302	Re-start (moving subgroup size)
303	Correction (moving subgroup size)
304	Master measurement (calibration value with moving subgroup size)
	For Special Measurements:
400	Synchronization of partial measurements and differing subgroup sizes
401	Calibrating measurement (gage calibration)
402	Setup measurement (setup/alignment of measuring device)
410	Release measurement (for measuring device tests)
411	Selection (extraordinary 100% measurement in case of stability violation in a subgroup)
420	Counter-check (repeat measurement) of the production facility

Example for the application of attribute 255

If not all the characteristics (MM) of one part are measured all the time and the part allocation is to be preserved, then the **Attribute 255** must be allocated to the measurements not carried out in order to fill in the data structure.

<-- MM1 -->		<-- MM2 -->		<-- MM3 -->		<-- MM4 -->		<-- MM5 -->	
1.34	0	5.78	0	9.44	0	0.00	255	0.00	255
1.28	0	5.31	0	9.79	0	0.00	255	0.00	255
1.41	0	5.02	0	9.12	0	0.00	255	0.00	255
1.30	0	5.55	0	9.49	0	0.00	255	0.00	255
1.36	0	5.25	0	9.44	0	2.45	0	4.67	0
1.14	0	5.09	0	9.65	0	2.22	0	4.48	0
1.33	0	5.19	0	9.59	0	2.38	0	4.55	0
1.42	0	5.33	0	9.71	0	2.31	0	4.62	0
0.00	255	0.00	255	0.00	255	2.29	0	4.65	0
0.00	255	0.00	255	0.00	255	2.27	0	4.58	0

The following tabular data structure will be the result. Every value line contains all characteristics values of one part. Missing measurements will be listed as an empty data field.

Nr.	MM1	MM2	MM3	MM4	MM5
1	1.34	5.78	9.44		
2	1.28	5.31	9.79		
3	1.41	5.02	9.12		
4	1.30	5.55	9.49		
5	1.36	5.25	9.44	2.45	4.67
6	1.14	5.09	9.65	2.22	4.48
7	1.33	5.19	9.59	2.38	4.55
8	1.42	5.33	9.71	2.31	4.62
9				2.29	4.65
10				2.27	4.58

Example for the application of attribute 256

If not all the characteristics (MM) of a part are measured all the time, then the **Attribute 256** must be allocated to missing measurements if the correct part allocation of the measurement values is not required.

<-- MM1 -->		<-- MM2 -->		<-- MM3 -->		<-- MM4 -->		<-- MM5 -->	
1.34	0	5.78	0	9.44	0	0.00	256	0.00	256
1.28	0	5.31	0	9.79	0	0.00	256	0.00	256
1.41	0	5.02	0	9.12	0	0.00	256	0.00	256
1.30	0	5.55	0	9.49	0	0.00	256	0.00	256
1.36	0	5.25	0	9.44	0	2.45	0	4.67	0
1.14	0	5.09	0	9.65	0	2.22	0	4.48	0
1.33	0	5.19	0	9.59	0	2.38	0	4.55	0
1.42	0	5.33	0	9.71	0	2.31	0	4.62	0
0.00	256	0.00	256	0.00	256	2.29	0	4.65	0
0.00	256	0.00	256	0.00	256	2.27	0	4.58	0

The following tabular data structure will be the result. With this notation, the measurement values are recorded in empty data fields, which means that values listed in one line, may be based on measurements from different parts.

Nr.	MM1	MM2	MM3	MM4	MM5
1	1.34	5.78	9.44	2.45	4.67
2	1.28	5.31	9.79	2.22	4.48
3	1.41	5.02	9.12	2.38	4.55
4	1.30	5.55	9.49	2.31	4.62
5	1.36	5.25	9.44	2.29	4.65
6	1.14	5.09	9.65	2.27	4.58
7	1.33	5.19	9.59		
8	1.42	5.33	9.71		
9					
10					

3.1.3.2 Date/Time

The following format must be adhered to:

Date:

DD => Day
 MM => Month
 YY => Year (last two digits)
 YYYY => Year (four digits)

Months may not be used because of their dependence on language (i.e.: 17th June 1996).

Time:

HH => Hours
 MM => Minutes
 SS => Seconds

The following notations are permitted:

Date		Time	
Format	Example	Format	Example
DD.MM.YY	17.06.96	HH:MM:SS	15:20:25
DD.MM.YYYY	17.06.1996	H:M:S	5:3:6
MM/DD/YY	6/15/96	HH:MM	5:23
MM/DD/YYYY	1/30/1996	HH	5
YY-MM-DD	96-4-26	...	5:4:8am
YYY-MM-DD	1996-10-23		5:4:8pm
			5:4:8a
			5:4:8p

Date and time must be separated by a slash “/”

For the output of date and time, the date must be listed before the time.

Example:

Notation without K field:

¶07.05.1992/13:48:10

Notation with K field:

K0004/1 07.05.1992/13:48:10

3.1.3.3 Events

If several events are written for one measurement value, they are separated by commas.

Example:

Notation without K field:

¶1,3,5

Notation with K field:

K0005/1 1,3,5

The field contents reference catalog records, i.e. the records 1, 3 and 5 point to the first, third, and fifth event of the event (sub) catalog. The field K2060 makes it possible to stipulate at the characteristics level which catalog (overall catalog or one of the sub-catalogs) will be used as a reference.

3.1.3.4 Process Parameter

Process parameters are composed of a process parameter number and a process parameter value. If process parameters are written for one measurement value, they will be marked by square brackets []. The records for a process parameter data set, combined from process parameter number and process parameter value, are separated by spaces. Several process parameter data sets related to ONE measurement value are separated by commas.

Example:

Notation without K field:

¶[1 1,3 8,5 7]

Notation with K field:

K0011/1 [1 1,3 8,5 7]

Three process parameters (number 1, 3 and 5) are recorded for the measurement value:

process parameter value 1 is recorded for process parameter number 1

process parameter value 8 is recorded for process parameter number 3

process parameter value 7 is recorded for process parameter number 5

In this case, the records also make reference to catalogs. The field K2061 stipulates at the characteristics level, which process parameter catalog is used as a reference (overall catalog or one of the sub-catalogs).

4 Application examples for Sample- and Process Analysis

Typical application examples in the following show field contents and field relations that should be especially observed for the controlling K-fields.

The possible contents for fields with a “defined field contents” remark can be found in the appendix of this manual.

4.1 Variable Characteristics

K-Field	Content / Remark
K2004	0 = Characteristic type “variable” (defined field contents)
K2005	Characteristic class (defined field contents)
K2008	0 = Group type “no group” (defined field contents)
K2009	Measured quantity (defined field contents)
K2011	Saved distribution model (defined field contents)
K2101	Nominal value / required in combination with K2112 / K2113
K2110	Alternative to K2112
K2111	Alternative to K2113
K2112	Alternative to K2110
K2113	Alternative to K2111
K2120	Lower limit type (defined field contents)
K2121	Upper limit type (defined field contents)
K8500	Subgroup size (for Process Capability Analysis)
K8501	Subgroup type / defined field contents (for Process Capability Analysis)

4.2 Attribute Characteristics

K-Field	Content / Remark
K2004	1 = Characteristic type “attribute” (defined field contents)
K2011	100 = “Binomial distribution”, 200 = “Poisson distribution” (defined field content)
K8503	Subgroup type “attribute” (defined field contents)
K8505	Number of parts, attribute

4.3 Positional Tolerances

True Position:

K-Field	Content / Remark
K2004	0 = Characteristic type "variable" (defined field contents)
K2005	Characteristic class (defined field contents)
K2008	2 = Group type "Positional Tolerance" (defined field contents)
K2009	109 = Measured quantity "Position" (defined field contents)
K2011	Saved distribution (defined field contents)
K2101	Nominal value / required in combination with K2112 / K2113
K2110	Alternative to K2112
K2111	Alternative to K2113
K2112	Alternative to K2110
K2113	Alternative to K2111
K2120	2 = Lower limit type "natural boundary" (defined field contents)
K2121	1 = Upper limit type "limit" (defined field contents)
K5xxx	Grouping
K8500	Subgroup size (for Process Capability Analysis)
K8501	Subgroup type / defined field contents (for Process Capability Analysis)

Coordinates:

K-Field	Content / Remark
K2004	0 = Characteristic type "variable" (defined field contents)
K2005	Characteristic class (defined field contents)
K2008	0 = Group type "Coordinate" (defined field contents)
K2009	117 = Measured quantity "Coordinate" (defined field contents)
K2011	Saved distribution (defined field contents)
K2101	Nominal value / required in combination with K2112 / K2113
K2110	Alternative to K2112
K2111	Alternative to K2113
K2112	Alternative to K2110
K2113	Alternative to K2111
K5xxx	Grouping
K8500	Subgroup size (for Process Capability Analysis)
K8501	Subgroup type / defined field contents (for Process Capability Analysis)

4.4 Error Log Sheets

ELS:

K-Field	Content / Remark
K2004	6 = Characteristic type "ELS" (defined field contents)
K2008	6 = Group type "ELS" (defined field contents)
K2011	200 = Poisson distribution (defined field contents)
K5xxx	Grouping
K8503	Subgroup type attribute (defined field contents)
K8505	Number of parts attribute (defined field contents)

Error types:

K-Field	Content / Remark
K2004	5 = Characteristic type "Error type" (defined field contents)
K2008	0 = Group type "Error type" (defined field contents)
K2011	200 = Poisson distribution (defined field contents)
K5xxx	Grouping
K8503	Subgroup type attribute (defined field contents)
K8505	Number of parts attribute (defined field contents)

4.5 Best Fit Move

Superimposed BFM Group:

K-Field	Content / Remark
K2004	0 = Characteristic type "variable" (defined field contents)
K2005	Characteristic class (defined field contents)
K2008	9 = Group type "Superimposed group" (defined field contents)
K2009	Measured quantity (defined field contents)
K2011	Saved distribution (defined field contents)
K2101	Nominal value / required in combination with K2112 / K2113
K2110	Alternative to K2112
K2111	Alternative to K2113
K2112	Alternative to K2110
K2113	Alternative to K2111
K2120	Lower limit type (defined field contents)
K2121	Upper limit type (defined field contents)
K5xxx	Grouping
K8500	Subgroup size (for Process Capability Analysis)
K8501	Subgroup type / defined field contents (for Process Capability Analysis)

True Position and Coordinates:

As described in chapter 4.3 Positional Tolerances.

5 Application examples for Measurement System Analysis

The following matrix is used for detailed marking of the measurements of the individual studies:

Measurement taken in the precision measuring room	Measurement taken using a gage	Parameter description for repeat measurements
Reference (R_L)	Reference (R_G)	Reference L
Work piece (P_L)	Work piece (P_G)	Trial R

Number of different work pieces / References: Part N

This matrix indicates that work pieces and/or reference parts may be measured at different locations (in precision measuring room (L) or at the gage (G)). Descriptions for the combination from type of measured part and location R (reference) or P (part) as well as L (laboratory) and G (gage system) are used.

Note:

The matrix display is standardized in order to clarify the dependencies between the different studies. Displays in qs-STAT[®], individual norms, or company standards may be different.

5.1 Characteristics Data Specifics

Depending on the applied study the following key fields must be filled in at the characteristics level. **Furthermore and depending on the used study, more and additional fields may have to be filled out in order to be able to perform specification conforming studies.**

Study	K2202	K2205	K2213	K2220	K2221	K2222
Type 1	1	-	X	1	1	X
Type 2	2	X	-	X	X	-
Type 3	3	X	-	1	X	-
Type 4	42	1	-	X	X	-
Type 5	51	1	-	X	X	-
CNOMO1	4	1	-	1	X	X
CNOMO2	5	X	-	1	X	X
Stability	93	-	-	1	X	-
Linearity	94	X	-	1	X	X
Short Range	92	X	-	X	1	-
GM Type 2	72	X	-	X	X	X
GM Type 3	73	X	-	1	X	X
GM Type 1A	81	X	-	-	-	1
Attribute	95	X	-	X	X	X

X: variable setting
 - will be ignored
 Numbers: fixed setting according to GC type

The maximum or minimum values for fields with variable settings depend on different company standards and may not be listed here.

As an alternative, it is possible to save measurement values with or without the use of K fields.

5.2 Value Data Specifics

5.2.1 Notation using K fields

Notation usage:

K00XX/CharacteristicNo/ValueNo/PartNo/TrialNo/Operator/Reference


For reference of the measurement values and additional data in the GC matrices.

Study	K00xx
Type-1	CharNo/0/0/1/1/RefNo
Type-2	CharNo/0/Part/Trial/Oper.
Type-3	CharNo/0/Part/Trial
Type-4	CharNo/0/1/Trial/Oper.
Type-5	CharNo/0/1/Trial/Oper.
CNOMO1	CharNo/0/1/Trial/1/RefNo
CNOMO2	CharNo/0/Part/Trial/1/RefNo
Stability	CharNo/0/Part/Trial
Linearity	CharNo/0/Part/Trial/1/RefNo.
Short Range	CharNo/0/Parts/1/Oper.
GM Type-2	CharNo/0/Parts/Trial/Oper./RefNo
GM Type-3	CharNo/0/Parts/Trial/1/RefNo
GM Type-1A	CharNo/0/Parts/1/Oper./RefNo
Attribute	CharNo/0/Parts/Trial/Oper./RefNo

Notation K0001/0/... (CharNo = 0) is not allowed !

5.2.1.1 Type-1 Study

Matrix

Measurement (R_G)	
1	 L References
...	
...	
L	

Data format settings

K field	Description	
K2202	GC-Study	1
K2205	Number of parts	0
K2220	Number of operators	1
K2221	Number of trials	1
K2222	Number of reference measurements	L

Usage of K fields at the value level:

K00xx/CharNo/0/0/1/1/RefNo

Example for a Type-1 Study

Settings:

K2202	GC-Study	1
K2205	Number of parts	0
K2220	Number of operators	1
K2221	Number of trials	1
K2222	Number of reference measurements	10

Measurement values

Measurement	Measurement value
1	10.1
2	10.2
3	10.1
4	10.4
5	10.15
6	10.1
7	10.1
8	10.1
9	10.1
10	10.1

Saving of values for characteristic no. X

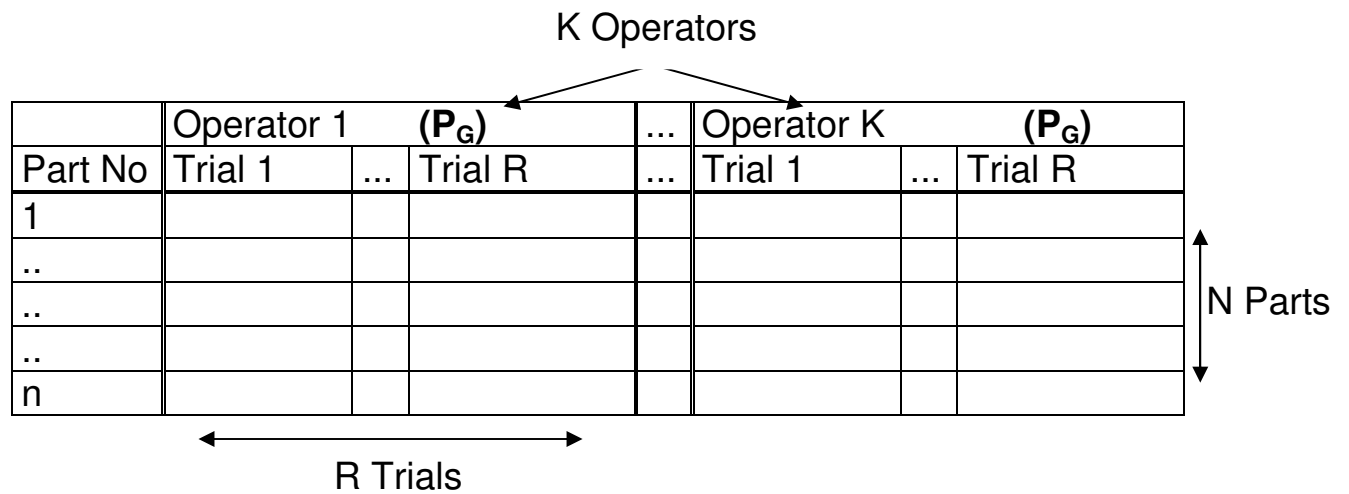
K00xx/CharNo/0/0/1/1/RefNo

K0001/X/0/0/1/1/1	10.1	{ Reference 1}
K0001/X/0/0/1/1/2	10.2	
K0001/X/0/0/1/1/3	10.1	
K0001/X/0/0/1/1/4	10.4	
K0001/X/0/0/1/1/5	10.15	
K0001/X/0/0/1/1/6	10.1	
K0001/X/0/0/1/1/7	10.1	
K0001/X/0/0/1/1/8	10.1	

..

5.2.1.2 Type-2 Study

Matrix



Settings

K2202	GC-Study	2
K2205	Number of parts	N
K2220	Number of operators	K
K2221	Number of trials	R
K2222	Number of reference measurements	0

Usage of the K fields at the value level:

K00xx/CharNo/0/Part/Trial/Oper

Example for a Type-2 Study

Settings:

K2202	GC-Study	2
K2205	Number of parts	5
K2220	Number of operators	2
K2221	Number of trials	3
K2222	Number of reference measurements	0

Measurement values

Part No	Operator 1			Operator 2		
	Trial 1	Trial 2	Trial 3	Trial 1	Trial 2	Trial 3
1	10.111	10.112	10.113	10.211	10.212	10.213
2	10.121	10.122	10.123	10.221	10.222	10.223
3	10.131	10.132	10.133	10.231	10.232	10.233
4	10.141	10.142	10.143	10.241	10.242	10.243
5	10.151	10.152	10.153	10.251	10.252	10.253

Saving of values for characteristic no. X

K00xx/CharNo/0/Part/Trial/Oper

```

K0001/X/0/1/1/1 10.111    { Part=1, Trial = 1, Oper = 1}
K0001/X/0/2/1/1 10.121
K0001/X/0/3/1/1 10.131
K0001/X/0/4/1/1 10.141
K0001/X/0/5/1/1 10.151
K0001/X/0/1/2/1 10.112    { Part=1, Trial = 2, Oper = 1}
K0001/X/0/2/2/1 10.122
K0001/X/0/3/2/1 10.132
...
K0001/X/0/3/2/2 10.232    { Part=3, Trial = 2, Oper = 2}
....

```

5.2.1.3 Type-3 Study

Matrix

Part No.	Trial 1 (P_G)	...	Trial R (P_G)
1			
..			
..			
..			
n			

← R Trials →

↑ N Parts ↓

Settings

K2202	GC-Study	3
K2205	Number of parts	N
K2220	Number of operators	1
K2221	Number of trials	R
K2222	Number of reference measurements	0

Usage of the K fields at the value level:

K00xx/CharNo/0/Part/Trial

Example for a Type-3 Study

Settings:

K2202	GC-Study	3
K2205	Number of parts	5
K2220	Number of operators	1
K2221	Number of trials	3
K2222	Number of reference measurements	0

Measurement values

Part No.	Trial 1	Trial 2	Trial 3
1	10.111	10.112	10.113
2	10.121	10.122	10.123
3	10.131	10.132	10.133
4	10.141	10.142	10.143
5	10.151	10.152	10.153

Saving of values for characteristic no. X

K00xx/CharNo/0/Part/Trial

```

K0001/X/0/1/1  10.111    { Part=1, Trial = 1}
K0001/X/0/2/1  10.121
K0001/X/0/3/1  10.131
K0001/X/0/4/1  10.141
K0001/X/0/5/1  10.151
K0001/X/0/1/2  10.112    { Part=1, Trial = 2}
K0001/X/0/2/2  10.122
K0001/X/0/3/2  10.132

```

...

5.2.1.4 Type-4 Study

Matrix

	1 st repeat measurement (Operator 1)	...	K th repeat measurement (Operator K)
1			
...			
...			
...			
R			

←—————→
K Operators

↑
R Trials
↓

Settings:

K2202	GC-Study	42
K2205	Number of parts	1
K2220	Number of operators	K
K2221	Number of trials	R
K2222	Number of reference measurements	0

Usage of the K fields at the value level:

K00xx/CharNo/0/1/Trial/Oper

Example for a Type-4 Study

Settings:

K2202	GC-Study	42
K2205	Number of parts	1
K2220	Number of operators	2
K2221	Number of trials	5
K2222	Number of reference measurements	0

Measurement values

	1 st repeat measurement (Operator 1)	2 nd repeat measurement (Operator 2)
(Trial) 1	10.111	10.112
(Trial) 2	10.121	10.122
(Trial) 3	10.131	10.132
(Trial) 4	10.141	10.142
(Trial) 5	10.151	10.152

Saving of values for characteristic no. X

K00xx/CharNo/0/1/Trial/Oper

```

K0001/X/0/1/1/1 10.111    { Part=1, Trial = 1, Oper = 1 }
K0001/X/0/1/2/1 10.121
K0001/X/0/1/3/1 10.131
K0001/X/0/1/4/1 10.141
K0001/X/0/1/5/1 10.151
K0001/X/0/1/1/2 10.112    { Part=1, Trial = 1, Oper = 2}
K0001/X/0/1/2/2 10.122
K0001/X/0/1/3/2 10.132

```

...

5.2.1.5 Type-5 Study

Matrix

	Master	Part
1		
...		
R		
...		
...		
K		

Settings:

K2202	GC-Study	51
K2205	Number of parts	1
K2220	Number of operators (Masters)	K
K2221	Number of trials	R
K2222	Number of reference measurements	0

Usage of the K fields at the value level:

K00xx/CharNo/0/1/Trial/Oper

Example for a Type-5 Study

Settings:

K2202	GC-Study	51
K2205	Number of parts	1
K2220	Number of operators (masters)	5
K2221	Number of trials	2
K2222	Number of reference measurements	0

Measurement values

	Master	Part
1	10.111	10.112
2	10.121	10.122
3	10.131	
4	10.141	
5	10.151	

Saving of values for characteristic no. X

K00xx/CharNo/0/1/Trial/Oper

```

K0001/X/0/1/0/1 10.111    { Part=1, Trial = 0, Oper = 1}
K0001/X/0/1/0/2 10.121
K0001/X/0/1/0/3 10.131
K0001/X/0/1/0/4 10.141
K0001/X/0/1/0/5 10.151
K0001/X/0/1/1/0 10.112    { Part=1, Trial = 1, Oper = 0}
K0001/X/0/1/2/0 10.122

```

5.2.1.6 Complete CNOMO Study

The complete CNOMO study contains the

- repeatability measurement of the setting master on the gage
- repeatability measurement of a work piece on the gage
- measurement of several work pieces on the gage
- measurement of several work pieces in the precision measuring room

In order to illustrate this study in the data format pairs of characteristics must be created. One of the characteristics in the pair must be called “CNOMO1” study and the second “CNOMO2” study.

The characteristic type “CNOMO1” study contains the data from the “preliminary phases” of the characteristic:

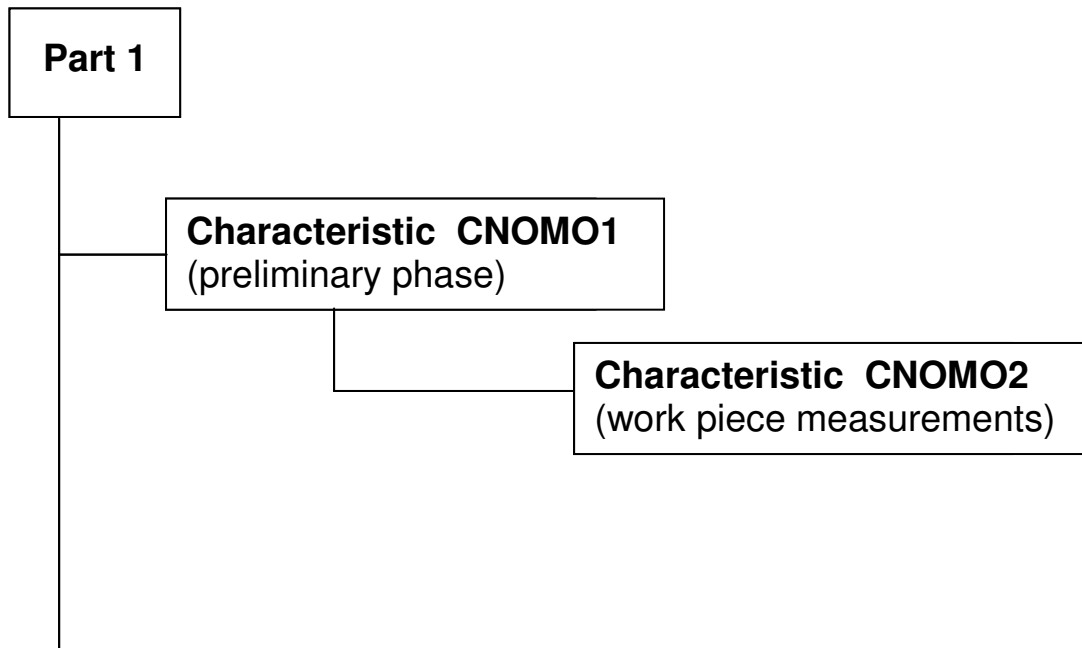
- repeatability measurement of the setting master on the gage
- repeatability measurement of a work piece on the gage

The characteristic type “CNOMO2” study contains the data of the work piece measurements of the characteristic:

- measurement of several work pieces on the gage
- measurement of several work pieces in the precision measuring room

Characteristics structure of a complete CNOMO study

The pairs of characteristics must be built hierarchically with the help of the grouping mechanisms of the data format, so that the following characteristics structure will be created in the data format for a tested characteristic:



This structure must be repeated for every tested characteristic.

5.2.1.7 CNOMO 1

Matrix

Part	Master (R_G)			Work piece (P_G)		
	1	..	L	1	..	R
1 (=N)						

N (= 1) Parts

Settings:

K2202	GC-Study	4
K2205	Number of parts	1
K2220	Number of operators	1
K2221	Number of trials	R
K2222	Number of reference measurements	L

Usage of the K fields at the value level:

K00xx/CharNo/0/1/Trial/1/RefNr

Remark

The CNOMO 1 study contains the “preparatory phase” and includes

- the repeatability measurement of the setting master
- the repeatability measurement of a work piece on the gage.

The decisive fields for the identification of a characteristic as a CNOMO 1 study are listed above. In addition, the necessary reference figures and data for a characteristics definition must be recorded.

Example for a CNOMO 1 Study

Settings:

K2202	GC-Study	4
K2205	Number of parts	1
K2220	Number of operators	1
K2221	Number of trials	5
K2222	Number of reference measurements	2

Measurement values

Part	Master		Work piece					N (=1) Parts
	1	2	1	2	3	4	5	
1	10.111	10.121	10.112	10.122	10.132	10.142	10.152	

Saving of values for characteristic no. X

K00xx/CharNo/0/1/Trial/1/RefNo

```

K0001/X/0/1/0/1/1  10.111 { Part=1, Trial = 0, Oper = 1, RefNo = 1 }
K0001/X/0/1/0/1/2  10.121
K0001/X/0/1/1/1/0  10.112 { Part=1, Trial = 1, Oper = 1, RefNo = 0 }
K0001/X/0/1/2/1/0  10.122
K0001/X/0/1/3/1/0  10.132
K0001/X/0/1/4/1/0  10.142
K0001/X/0/1/5/1/0  10.152

```

5.2.1.8 CNOMO 2

Matrix

	Precision meas. (P _G) technique			Work piece measurements (P _G)		
Part	1	..	L	1	..	R
1						
..						
..						
..						
..						
N						

←—————→
←—————→

L References
R Trials

↑
N Parts
↓

Settings:

K2202	GC-Study	5
K2205	Number of parts	N
K2220	Number of operators	1
K2221	Number of trials	R
K2222	Number of reference measurements	L

Usage of the K fields at the value level:

K00xx/CharNo/0/Part/Trial/1/RefNo

Remark

The CNOMO 2 study contains the data of the work piece measurements of a certain characteristic:

- measurement of several work pieces on the gage
- measurement of several work pieces in the precision measuring room

The decisive fields for the identification of a characteristic as a CNOMO 2 study are listed above. In addition, the necessary reference figures and data for a characteristics definition must be recorded.

Example for a CNOMO 2 Study

Settings:

K2202	GC-Study	5
K2205	Number of parts	3
K2220	Number of operators	1
K2221	Number of trials	4
K2222	Number of reference measurements	2

Measurement values

Part	Precision meas. technique		Work piece measurements			
	1	2	1	2	3	4
1	10.211	10.221	10.111	10.121	10.131	10.141
2	10.212	10.222	10.112	10.122	10.132	10.142
3	10.213	10.223	10.113	10.123	10.133	10.143

← L References
R Trials

N Parts

Saving of values for characteristic no. X

K00xx/CharNo/0/Part/Trial/1/RefNo

```

K0001/X/0/1/1/1/0  10.111 { Part=1, Trial = 1, Oper = 1, RefNr =0}
K0001/X/0/1/2/1/0  10.121
K0001/X/0/1/3/1/0  10.131
K0001/X/0/1/4/1/0  10.141
K0001/X/0/2/1/1/0  10.112 { Part=2, Trial = 1, Oper = 1, RefNr = 0}
K0001/X/0/2/2/1/0  10.122
K0001/X/0/2/3/1/0  10.132
K0001/X/0/2/4/1/0  10.142
...
K0001/X/0/1/0/1/1  10.211 { Part=1, Trial = 0, Oper = 1, RefNr = 1}
K0001/X/0/1/0/1/2  10.211
....

```

5.2.1.9 Stability

Matrix

Subgroup	1 st measurement	...	R measurement
1			
..			
..			
..			
..			
..			
..			
M

← R Trials →

M Subgroups

Settings:

K2202	GC-Study	93
K2205	Number of parts	-
K2220	Number of operator	1
K2221	Number of trials	R
K2222	Number of reference measurements	0

The number of subgroups (M) is not predetermined.

Usage of the K fields at the value level:

K00xx/CharNo/0/Part/Trial

Example for a Stability Study

Settings:

K2202	GC-Study	93
K2205	Number of parts	-
K2220	Number of operators	1
K2221	Number of trials	2
K2222	Number of reference measurements	0

Measurement values

Subgroup	1 st Trial	2 nd Trial
1	10.111	10.112
2	10.121	10.122
3	10.131	10.132
4	10.141	10.142
5	10.151	10.152
N

Saving of values for characteristic no. X

K00xx/CharNo/0/Part/Trial

K0001/X/0/1/1	10.111	{ Part=1, Trial = 1}
K0001/X/0/2/1	10.121	{ Part=2, Trial = 1}
K0001/X/0/3/1	10.131	
K0001/X/0/4/1	10.141	
K0001/X/0/5/1	10.151	
K0001/X/0/1/2	10.112	{ Part=1, Trial = 2}
K0001/X/0/2/2	10.122	{ Part=2, Trial = 2}
K0001/X/0/3/2	10.132	

...

5.2.1.10 Linearity

Matrix

	Master Measurement (R_L)			Measurements using Gage (R_G)		
Part	1	...	L	1	...	R
1						
..						
..						
..						
..						
N						

← L References →
← R Trials →

↑
 N Parts
↓

Settings:

K2202	GC-Study	94
K2205	Number of parts	N
K2220	Number of operators	1
K2221	Number of trials	R
K2222	Number of reference measurements	L

Usage of the K fields at the value level:

K00xx/CharNo/0/Part/Trial/1/RefNo

Example for a Linearity Study

Settings:

K2202	GC-Study	94
K2205	Number of parts	3
K2220	Number of operators	1
K2221	Number of trials	4
K2222	Number of reference measurements	2

Measurement values

Part	Master measurement		Work piece measurements			
	1	2	1	2	3	4
1	10.211	10.221	10.111	10.121	10.131	10.141
2	10.212	10.222	10.112	10.122	10.132	10.142
3	10.213	10.223	10.113	10.123	10.133	10.143

Saving of values for characteristic no. X

K00xx/CharNo/0/Part/Trial/1/RefNo

```

K0001/X/0/1/1/1/0  10.111 { Part=1, Trial = 1, Oper = 1, RefNr =0}
K0001/X/0/1/2/1/0  10.121
K0001/X/0/1/3/1/0  10.131
K0001/X/0/1/4/1/0  10.141
K0001/X/0/2/1/1/0  10.112 { Part=2, Trial = 1, Oper = 1, RefNr = 0}
K0001/X/0/2/2/1/0  10.122
K0001/X/0/2/3/1/0  10.132
K0001/X/0/2/4/1/0  10.142

```

...

```

K0001/X/0/1/0/1/1  10.211 { Part=1, Trial = 0, Oper = 1, RefNr = 1}
K0001/X/0/1/0/1/2  10.221

```

....

5.2.1.11 Short Range

Matrix

Part No.	Operator 1 (P_G)	...	Operator K (P_G)
1			
..			
..			
...			
N			

←—————→
K Operators

↑
N Parts
↓

Settings:

K2202	GC-Study	92
K2205	Number of parts	N
K2220	Number of operators	K
K2221	Number of trials	1
K2222	Number of reference measurements	0

Usage of the K fields at the value level:

K00xx/CharNo/0/Part/1/Oper

Example for a Short Range Study

Settings:

K2202	GC-Study	92
K2205	Number of parts	5
K2220	Number of operators	2
K2221	Number of trials	1
K2222	Number of reference measurements	0

Measurement values

Part No.	Operator 1	Operator 2
1	10.111	10.211
2	10.121	10.221
3	10.131	10.231
4	10.141	10.241
5	10.151	10.251

Saving of values for characteristics no. X

K00xx/CharNo/0/Part/1/Oper

```

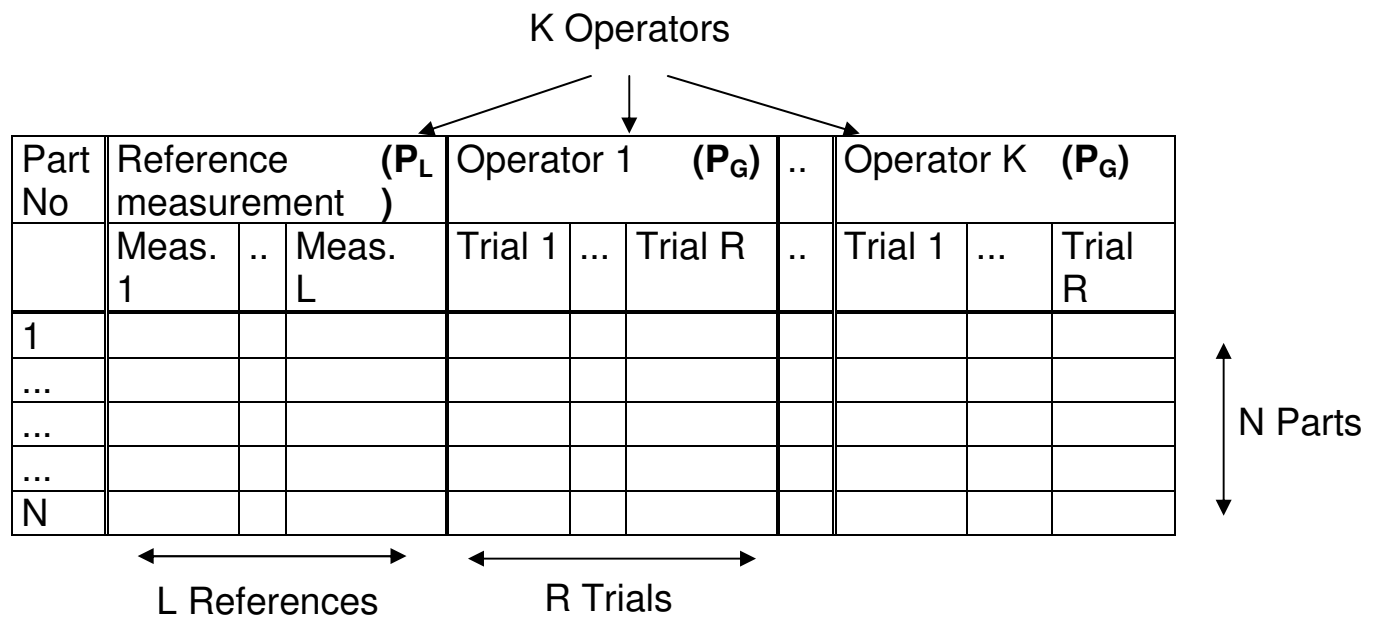
K0001/X/0/1/1/1 10.111    { Part=1, Trial = 1, Oper = 1}
K0001/X/0/2/1/1 10.121
K0001/X/0/3/1/1 10.131
K0001/X/0/4/1/1 10.141
K0001/X/0/5/1/1 10.151
K0001/X/0/1/1/2 10.211    { Part=1, Trial = 1, Oper = 2}
K0001/X/0/2/1/2 10.221    { Part=2, Trial = 1, Oper = 2}

```

....

5.2.1.12 GM Type-2 Study

Matrix



Settings:

K2202	GC-Study	72
K2205	Number of parts	N
K2220	Number of operators	K
K2221	Number of trials	R
K2222	Number of reference measurements	L

Usage of K fields at the value level:

K00xx/CharNo/0/Parts/Trial/Oper/RefNo

Example for a GM Type-2 Study

Settings:

K2202	GC-Study	72
K2205	Number of parts	5
K2220	Number of operators	2
K2221	Number of trials	2
K2222	Number of reference measurements	2

Measurement values

Part No.	Ref. measurement		Operator 1		Operator 2	
	Meas. 1	Meas. 2	Trial 1	Trial 2	Trial 1	Trial 2
1	10.1111	10.1112	10.111	10.112	10.211	10.212
2	10.1211	10.1212	10.121	10.122	10.221	10.222
3	10.1311	10.1312	10.131	10.132	10.231	10.232
4	10.1411	10.1412	10.141	10.142	10.241	10.242
5	10.1511	10.1512	10.151	10.152	10.251	10.252

Saving of values for characteristic no. X

K00xx/CharNo/0/Parts/Trial/Oper/RefNo

```

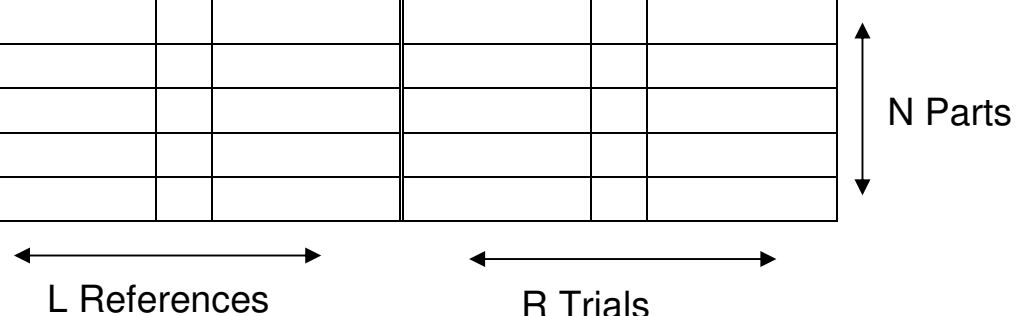
K0001/X/0/1/1/0/1  10.1111 { Part=1, Trial = 1, Oper = 0, RefNo = 1}
K0001/X/0/2/1/0/1  10.1211 { Part=2, Trial = 1, Oper = 0, RefNo = 1}
K0001/X/0/3/1/0/1  10.1311
K0001/X/0/4/1/0/1  10.1411
K0001/X/0/5/1/0/1  10.1511
K0001/X/0/1/1/0/2  10.1112 { Part=1, Trial = 1, Oper = 0, RefNo = 2}
....
K0001/X/0/1/1/1/0  10.111  { Part=1, Trial = 1, Oper = 1, RefNo = 0}
K0001/X/0/2/1/1/0  10.121
K0001/X/0/3/1/1/0  10.131
K0001/X/0/4/1/1/0  10.141
K0001/X/0/5/1/1/0  10.151
K0001/X/0/1/2/1/0  10.112  { Part=1, Trial = 2, Oper = 1, RefNo = 0}
K0001/X/0/2/2/1/0  10.122
K0001/X/0/3/2/1/0  10.132
...
K0001/X/0/3/2/2/0  10.232  { Part=3, Trial = 2, Oper = 2, RefNo = 0}
....

```

5.2.1.13 GM Type-3 Study

Matrix

Part No.	Reference measurement (P_L)			Work piece (P_G)		
	Measurement 1	...	Measurement L	Trial 1	...	Trial R
1						
...						
...						
...						
N						



Settings:

K2202	GC-Study	73
K2205	Number of parts	N
K2220	Number of operators	1
K2221	Number of trials	R
K2222	Number of reference measurements	L

Usage of the K fields at the value level:

K00xx/CharNo/0/Parts/Trial/Oper/RefNo

Example for a GM Type-3 Study

Settings:

K2202	GC-Type	73
K2205	Number of parts	5
K2220	Number of operators	1
K2221	Number of trials	3
K2222	Number of reference measurements	2

Measurement values

Part No.	Reference measurement		Trial 1	Trial 2	Trial 3
	Meas. 1	Meas. 2			
1	10.1111	10.1112	10.111	10.112	10.113
2	10.1211	10.1212	10.121	10.122	10.123
3	10.1311	10.1312	10.131	10.132	10.133
4	10.1411	10.1412	10.141	10.142	10.143
5	10.1511	10.1512	10.151	10.152	10.153

Saving of values for characteristic no. X

K00xx/CharNo/0/Parts/Trial/Oper/RefNo

```


K0001/X/0/1/1/0/1  10.1111  { Part=1, Trial = 1, Oper = 0, RefNo = 1}
K0001/X/0/2/1/0/1  10.1211  { Part=2, Trial = 1, Oper = 0, RefNo = 1}
K0001/X/0/3/1/0/1  10.1311
K0001/X/0/4/1/0/1  10.1411
K0001/X/0/5/1/0/1  10.1511
K0001/X/0/1/1/0/2  10.1112  { Part=1, Trial = 1, Oper = 0, RefNo = 2}
....
K0001/X/0/1/1/1/0  10.111  { Part=1, Trial = 1, Oper = 1, RefNo = 0}
K0001/X/0/2/1/1/0  10.121
K0001/X/0/3/1/1/0  10.131
K0001/X/0/4/1/1/0  10.141
K0001/X/0/5/1/1/0  10.151

```

5.2.1.14 GM Type-1A Study

Matrix

	Reference	Measurement (R_G)
1	1	1
2
...
N	N	N


 N Parts

Data format settings

K Field	Description	
K2202	GC-Type	81
K2205	Number of parts	N
K2220	Number of operators	1
K2221	Number of trials	1
K2222	Number of reference measurements	1

Usage of the K fields at the value level:

K00xx/CharNo/0/Part/1/1/RefNo

Example for a GM Type-1A Study

Settings:

K2202	GC-Study	81
K2205	Number of parts	10
K2220	Number of operators	1
K2221	Number of trials	1
K2222	Number of reference measurements	1

Measurement values

Measurement	Reference	Value
1	10.1111	10.1110
2	10.1211	10.1210
3	10.1311	10.1310
4	10.1411	10.1410
5	10.1511	10.1510
6	10.1611	10.1610
7	10.1711	10.1710
8	10.1811	10.1810
9	10.1911	10.1910
10	10.1011	10.1010

Saving of values for characteristic no. X

K00xx/CharNo/0/Part/1/Oper/RefNo

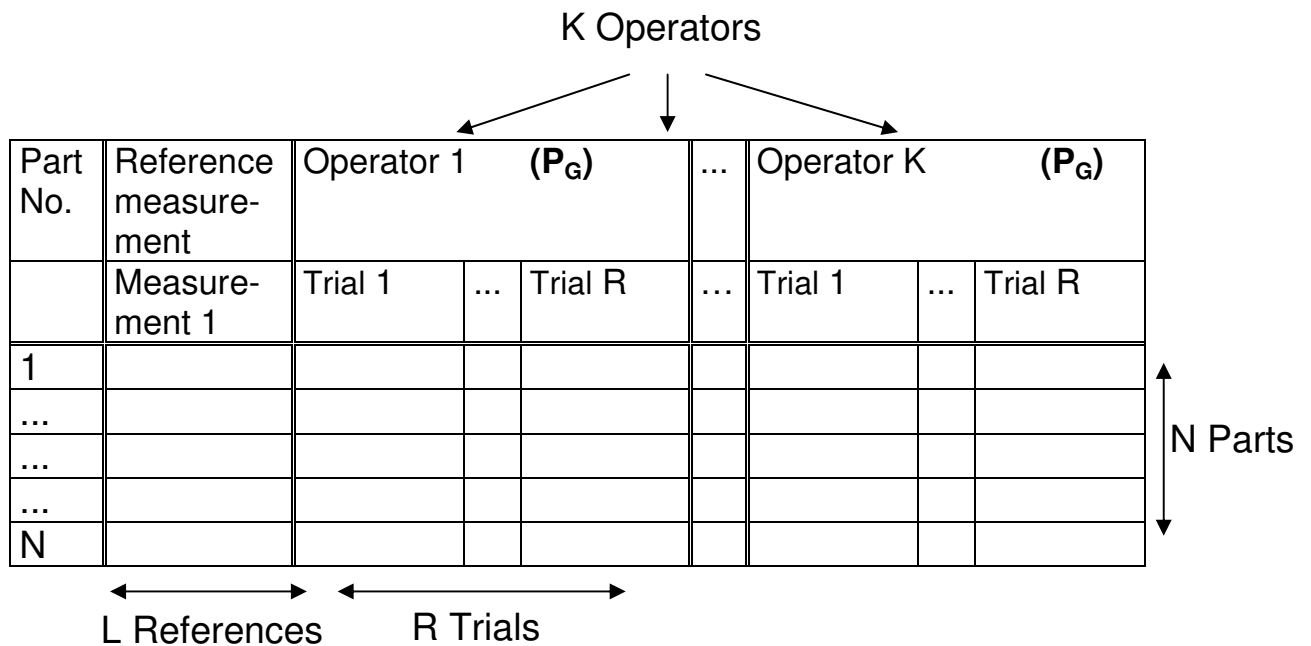
```

K0001/X/0/1/1/0/1  10.1111 { Part=1, Trial = 1, Oper = 0, RefNo = 1}
K0001/X/0/2/1/0/1  10.1211
K0001/X/0/3/1/0/1  10.1311
K0001/X/0/4/1/0/1  10.1411
K0001/X/0/5/1/0/1  10.1511 { Part=5, Trial = 1, Oper = 0, RefNo = 1}
...
K0001/X/0/1/1/1/0  10.1110 { Part=1, Trial = 1, Oper = 1, RefNo = 0}
K0001/X/0/2/1/1/0  10.1210
K0001/X/0/3/1/1/0  10.1310 { Part=3, Trial = 1, Oper = 1, RefNo = 0}
...

```

5.2.1.15 Attribute GC Study

Matrix



Settings:

K2202	GC-Type	95
K2205	Number of parts	N
K2220	Number of operators	K
K2221	Number of trials per operator	R
K2222	Number of reference measurements	L

Usage of the K fields at the value level:

K00xx/CharNo/0/Parts/Trial/Oper/RefNo

Note:

The positive or negative test result will be indicated by the measurement value 1 or 0 respectively when saving the file.

Example for an attribute GC Study

Settings:

K2202	GC-Study	95
K2205	Number of parts	5
K2220	Number of operators	2
K2221	Number of trial	2
K2222	Number of reference measurements	1

Measurement values

Part No.	Reference measurement	Operator 1		Operator 2	
		Trial 1	Trial 2	Trial 1	Trial 2
1	10.1111	+	+	+	+
2	10.1211	+	-	+	-
3	10.1311	-	+	-	+
4	10.1411	-	-	-	-
5	10.1511	-	+	+	+

Saving of values for characteristic no. X

K00xx/CharNo/0/Parts/Trial/Oper/RefNo

```

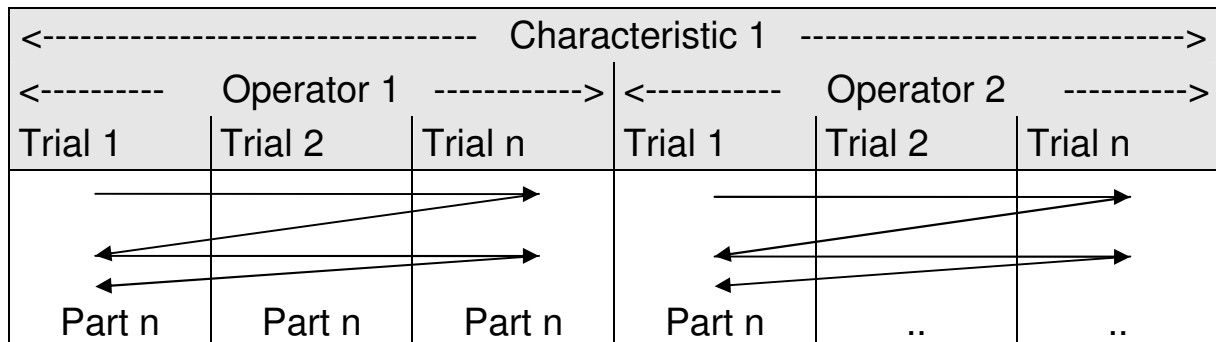
K0001/X/0/1/1/0/1  10.1111  { Part=1, Trial = 1, Oper = 0, RefNo = 1}
K0001/X/0/2/1/0/1  10.1211  { Part=1, Trial = 1, Oper = 0, RefNo = 1}
K0001/X/0/3/1/0/1  10.1311
K0001/X/0/4/1/0/1  10.1411
K0001/X/0/5/1/0/1  10.1511
...
K0001/X/0/1/1/1/0  1          { Part=1, Trial = 1, Oper = 1, RefNo = 0}
K0001/X/0/2/1/1/0  1
K0001/X/0/3/1/1/0  0
K0001/X/0/4/1/1/0  0
K0001/X/0/5/1/1/0  0
K0001/X/0/1/2/1/0  1          { Part=1, Trial = 2, Oper = 1, RefNo = 0}
K0001/X/0/2/2/1/0  0
K0001/X/0/3/2/1/0  1
...
K0001/X/0/3/2/2/0  1          { Part=3, Trial = 2, Oper = 2, RefNo = 0}
...

```

5.2.2 Notation without Usage of K Fields

Sequence for Measurement System Analysis:

When using the module Measurement System Analysis, the following pattern must be used to save the values of a characteristic for several measurements and several operators. This is in order to guarantee an explicit allocation of the values to the combination (characteristic, trial, operator):



This means that, when **saving** a characteristic, different measurement values follow each other until the number of parts to be measured is reached. Afterwards, the measurement values of other operators are filed following the same structure.

Ford – Type 4

	Repetitions				
Measurement	1	2	3	4	5
1	↓	↘			
2	↓	↓			
3					
4					
5					
n	↓	↓			

Ford – Type 5

Master measurement	Part measurement
↓	↘
↓	↓

CNOMO 1 (preliminary stage)

Measurement	Master	Work piece
1	↓	↘ ↓
2		
3		
n		

CNOMO 2 (acceptance)

Rep.	Part measurement			Precision lab.			
	Part 1	Part 2	Part 3	Part 1	Part 2	Part 3	Rep.
Rep. 1	↓	↘ ↓	↘ ≈ ↓	↘ § ↓	↘ ↓	↘ ↓	Rep. 1
Rep. 2							Rep. 2
Rep. 3							Rep. 3
Rep. 4							Rep. 4
Rep. n							Rep. N

Stability

Part No.	Repetitions				
	1	2	3	4	5
1	→				
2	→				
3	→				
4	→				
5	→				
n	→				

Linearity

Rep.	Number of Parts				Number of Parts		
	Part 1	Part 2	Part 3	Part 4	Part 1	Part 2	Part 3
Rep. 1	↓	↘ ↓	↘ ↓	↘ ↓	→		
Rep. 2							
Rep. 3							
Rep. 4							
Rep. n							

Short Range

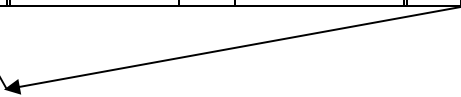
No. of parts	Operator 1	Operator 2	No. of Operators n
1	→	→	→
2	→	→	→
3	→	→	→
4	→	→	→
5	→	→	→
n	→	→	→

GM Type-1A Study

	Reference	Measurement (R_G)
1	1	1
2
...
N	N	N

Attribute GC Study

Part No.	Reference measurement	Operator 1 (P_G)			...	Operator K (P_G)		
		Trial 1	...	Trial R		Trial 1	...	Trial R
1	1	→	→	→	→	→	→	
...		→	→	→	→	→	→	
...		→	→	→	→	→	→	
...		→	→	→	→	→	→	
N	N	→	→	→	→	→	→	



6 Writing modes

The text in curved brackets is for an explanation of the examples only and should not be included in the actual data exchange format. In order to get a better overview, the K fields are separated by blank lines into single blocks. These blank lines may be deleted.

6.1 DFQ Structure

The example describes the data of one part with three characteristics. All the data will be saved to a shared DFQ file.

Both variants of the notation were used in the descriptive part, i.e. several characteristics on one line with corresponding characteristics separators, as well as the extension of the key number by a numerical characteristics number.

The value part also shows mixed notations, i.e. with and without the usage of K fields. Besides the measurement values, additional data was also recorded. A value line is structured as follows:

Value¶	{Measurement value of the first characteristic}
Attribute¶	{Attribute (0 = valid reading) of the measurement value}
Date/Time¶	{Date/Time of recording}
Event¶	{Events to the measurement (0 = no events)}
#Batch▫	{Batch number}
Value¶	{Measurement value of the second characteristic}
Attribute▫	{Attribute (0 = valid reading) of the measurement value}
SG size¶	{Subgroup size* of the third, attribute characteristic}
Error¶	{Number of errors within a subgroup}
0¶	{fixed record}
0<CR><LF>	{Attribute (0 = valid reading)}

* multiplied by 1000

K0100 3	{3 characteristics in the file}
K1001 08/15	{part number}
K1002 part 1	{part description}
K2004/0 0	{char. type "variable" for all characteristics}
K2005/0 4	{characteristics class "critical" for all chars.}
K2022/0 2	{number of decimal places for all chars.}
K2302/0 machine 1	{machine description for all chars.}
K2001 1.0▫1.2▫1.3	{characteristics no. for 3 characteristics}
K2101 10.00▫1.00	{nominal value for M1+ M2}
K2110 9.95▫0.98	{lower limit for M1+ M2}
K2111 10.05▫1.02	{upper limit for M1 + M2}
K2142 cm▫cm	{unit for M1 + M2}
K2001/1 1.1	{characteristics number for M1 overwritten}
K2002/1 length	{characteristics description M1}
K2311/1 turning	{production type M1}
K2402/1 caliper	{gage description M1}
K2002/2 diameter	{characteristics description M2}
K2022/2 3	{decimal places for M2 overwritten}
K2402/2 caliper	{gage description M2}
K2002/3 thread	{characteristics description M3}
K2004/3 1	{characteristics type "attribute" for M3 overwritten}
K2011/3 200	{distribution model Poisson distribution for M3}
K2311/3 cutting	{production type M3}
K2402/3 gage	{gage M3}
9.94▯0▯12.08.99/15:23:45▯0▯#123▫0.966▯0▫100000▯1▯0▯0▯	
9.95▯0▯12.08.99/15:23:58▯0▯#123▫1.091▯0▫100000▯2▯0▯0▯	
9.98▯0▯12.08.99/15:24:12▯0▯#123▫0.993▯0▫100000▯3▯0▯0▯	
10.01▯0▯12.08.99/15:24:38▯0▯#123▫0.964▯0▫100000▯1▯0▯0▯	
10.02▯0▯12.08.99/15:25:02▯0▯#123▫0.915▯0▫100000▯1▯0▯0▯	
10.06▯0▯12.08.99/15:25:37▯0▯#123▫1.011▯0▫100000▯2▯0▯0▯	
9.94▯0▯12.08.99/15:25:59▯0▯#123▫1.009▯0▫100000▯1▯0▯0▯	
9.99▯0▯12.08.99/15:26:17▯0▯#123▫1.011▯0▫100000▯2▯0▯0▯	
K0009/0 Any text could be recorded here and would be saved, in this case, together with the 8th value for all characteristics (/0)	
10.00▯0▯12.08.99/15:26:50▯0▯#123▫1.062▯0▫100000▯2▯0▯0▯	
10.03▯0▯12.08.99/15:27:23▯0▯#123▫1.011▯0▫100000▯1▯0▯0▯	
10.17▯0▯12.08.99/15:27:56▯3▯#123▫1.009▯0▫100000▯1▯0▯0▯	

6.2 DFD/DFX Structure

6.2.1 DFD/DFX-Structure with fixed file name

The file name for the DFD- and DFX file pair can be chosen arbitrarily within the possibilities of the operating system using this naming variant. In this case, the writing system appends new measurements to the values file (DFX) which keeps growing.

The same example, only in a shorter form, divided into two files (description and value file) would appear as follows:

Description file (*.DFD)

K0100 3	{3 characteristics in the file}
K1001 08/15	{part no.}
K1002 part 1	{part description}
K2004/0 0	{characteristics type "variable" for all chars.}
K2005/0 4	{characteristics class "critical"}
K2022/0 2	{number of decimal places}
K2302/0 machine 1	{machine description}
K2001 1.0▯1.2▯1.3	
K2101 10.00▯1.00	
K2002 length▯diameter▯thread	
K2110 9.95▯0.98	
K2111 10.05▯1.02	
K2142 cm▯cm	
K2311 turning▯turning▯cutting	
K2402 caliper▯caliper▯gage	
K2001/1 1.1	
K2022/2 3	{no. of decimal places for M2 overwritten}
K2004/3 1	{char. type "attribute" for M3 overwritten}
K2011/3 200	{distribution model Poisson distribution for M3}

Value file (*.DFX)

```

9.940012.08.99/15:23:4500#1230.9660010000011000
9.950012.08.99/15:23:5800#1231.091001000002000
9.980012.08.99/15:24:1200#1230.993001000003000
10.010012.08.99/15:24:3800#1230.9640010000011000
10.020012.08.99/15:25:0200#1230.9150010000011000
10.060012.08.99/15:25:3700#1231.011001000002000
9.940012.08.99/15:25:5900#1231.0090010000011000
9.990012.08.99/15:26:1700#1231.011001000002000
K0009/0 Any text could be recorded here and would be saved, in this
      case, together with the 8th value for all characteristics (/0)
10.000012.08.99/15:26:5000#1231.062001000002000
10.030012.08.99/15:27:2300#1231.0110010000011000
10.170012.08.99/15:27:5603#1231.0090010000011000

```

6.2.2DFD/DFX-Structure with file name as a counter

Using this variant, the complete file name either has a fixed length in form of a counter or consists of a prefix (with fixed length) and a counter (with fixed length).

File name = Prefix + Counter + File name extension

The prefix consists of arbitrary combinations of alphanumerical signs within the possibilities of the operating system.

The counter has to be formatted to a fixed length by filling up with zeros if required.

Example

The file name consists of an 8-digit counter

```
00000001.dfd
00000001.dfx
00000002.dfx
00000003.dfx
00000004.dfx
...
00000101.dfd
00000101.dfx
00000102.dfx
00000103.dfx
00000104.dfx
...
```



Changes of the parts- and characteristics data after 100 measurements

The file name consists of a 8-digit prefix („Shift01_“) and a 4-digit counter

```
Shift01_0001.dfd
Shift01_0001.dfx
Shift01_0002.dfx
Shift01_0003.dfx
Shift01_0004.dfx
...
Shift01_0101.dfd
Shift01_0101.dfx
Shift01_0102.dfx
Shift01_0103.dfx
Shift01_0104.dfx
...
```



Changes of the parts- and characteristics data after 100 measurements

Using this variant is recommended if the parameters of the measurement system and with this the part- and characteristics data change often, or if measurement value files shall be moved or deleted in order to keep the hard disc from filling up in continuous operation.

A new DFD-file has to be written for each change in the parts- or characteristics data and the counters of the DFD and DFX file have to be increased.

New measurements are appended to the file with the highest counter, or a new value file with the next counter status is generated after reaching a certain number of measurements inside this file (this can also mean one measurement per DFX file).

Using this variant, it has to be taken care that files per part type are saved to a separate sub-directory for each part type so that the combination of path and file name is unique. The number of measurements per DFX-file is determined by the known rules.

7 ASCII Transfer Format Certification

In order to avoid problems caused when files are created by third-party systems in Q-DAS[®] ASCII transfer format, Q-DAS[®] offers the certification of the data format. This is a confirmation that the specifications of the transfer format are observed or adhered to and offers the necessary security to the measurement system manufacturer, as well as to the final customer.

Certification includes verification of the syntax (notation verification) and verification of the contents (verification of completeness and plausibility) of the supplied sample data files.

On request, the transfer format may be explained in detail within the framework of a workshop or individual consultations. The interested party will receive all necessary documentation and will implement the Q-DAS[®] mandatory fields, as well as, all the other data required fields. After returning the certification documents, verification of the created data sets will be carried out by Q-DAS[®]. Deviations from the specifications will be discussed and the files will be verified again after the errors have been corrected. The certificates will be issued upon presentation of all the requirements.

Further information regarding the certification and a summary of the certified systems may be found on the Q-DAS[®] website.

8 Appendix

8.1 Key Fields Listing

The following table lists the supported fields according to key, field description, length and type.

Note: The currently valid list of fields will be published on the Q-DAS[®] website.

Key:

- the keys are structured according to the following pattern:
 - K00xx values/add. data
 - K1xxx parts data
 - K2xxx characteristics data
 - K5xxx structure information
 - K8xxx quality control chart
- for explicit identification of the data sets the following fields **must** be included in the data format:
 - K0100 no. of characteristics
 - K1001 part no.
 - K1002 part description
 - K2001 characteristics no.
 - K2002 characteristics description

Length:

- the numbers in brackets indicate the field length (no. of characters)

Type:

- Identification characters
 - I3 = Integer (1 Byte)
 - I5 = Integer (2 Byte)
 - I10 = Integer (4 Byte)
 - F = Float
 - D = Date/Time format
 - A = Alpha numerical
 - S = special coding

Notes:

- Hints regarding field contents
- Change date (C) respectively new record (N)
C/N will be supported by qs-STAT ME starting 01.01.01!
- Module specific usage: AS (Sample Analysis), PC (Process Capability), GC (Measurement System Analysis), RB (Reliability Analysis), PV (procella)

Key	Field description	Length	Type	Remarks
K0001	Values	[22]	F	
K0002	attribute	[5]	I5	e.g. 0=valid, 255=empty data field etc.
K0004	Time/Date	[---]	D	
K0005	Events	[---]	S	Catalog see K2060
K0006	Batch number / Ident number	[14]	A	
K0007	Cavity number / Spindle number	[10]	I10	Catalog based (if use of I10 instead I5 adjustment of field length in database required)
K0008	Operator name	[10]	I10	Catalog based (if use of I10 instead I5 adjustment of field length in database required)
K0009	Text	[255]	A	
K0010	Machine number	[10]	I10	Catalog based (or K1081 if no changes to field content, see K0007)
K0011	Process parameter	[---]	S	Catalog see K2061
K0012	Gage number	[10]	I10	Catalog based (if use of I10 instead I5 adjustment of field length in database required)
K0013	Process parameter value	[5]	I5	Process parameter value content is part of K0011
K0014	Part Ident	[40]	A	
K0015	Reason for test	[5]	I5	Defined field contents; N, ME6
K0016	Production number	[30]	A	N, ME6
K0017	Work piece fixture number	[30]	A	N, ME6
K0020	Subgroup size	[5]	I5	Only for attribute checks
K0021	No. of errors	[5]	I5	Only for attribute checks

Key	Field description	Length	Type	Remarks
K0053	Order number	[20]	A	or K1053 if no changes to field content
K0097	Values GUID			
K0100	Total number of characteristics in file	[5]	I5	C,12.6.97
K0999	No. of characteristics per part = 0	[5]	I5	C,12.6.97
K1001	Part number	[30]	A	
K1002	Part description	[80]	A	
K1003	Part abbreviation	[20]	A	
K1004	Part Amendment status	[20]	A	N,12.6.97
K1005	Product	[40]	A	see K1008
K1007	Part number - short description	[20]	A	N,3.7.97
K1008	Part type	[20]	A	N,26.10.98
K1009	Part code	[20]	A	N,26.10.98
K1010	Control item	[3]	I3	Defined field contents (see chapter 7.2)
K1011	Variant	[20]	A	N,26.10.98
K1012	ID number annex	[20]	A	N,26.10.98
K1013	ID number index	[20]	A	N,26.10.98
K1014	Part ident	[20]	A	N,26.10.98
K1015	Type of test	[3]	I3	N, ME4
K1016	Assembly part	[30]	A	N,26.8.02; Module ISR
K1017	Test plan locked	[3]	I3	
K1020	Manufacturer Catalog	[5]	I5	
K1021	Manufacturer Number Text	[20]	A	
K1022	Manufacturer Description	[80]	A	
K1023	Manufacturer Number	[5]	I5	
K1030	Material Catalog	[5]	I5	
K1031	Material Number Text	[20]	A	

Key	Field description	Length	Type	Remarks
K1032	Material Description	[40]	A	
K1033	Material Number	[5]	I5	N,12.6.97
K1040	Drawing Catalog	[5]	I5	
K1041	Drawing Number Text	[30]	A	C,12.6.97
K1042	Drawing Amendment	[20]	A	C,12.6.97
K1043	Drawing Index	[40]	A	
K1044	Drawing Number	[5]	I5	
K1045	Drawing validity date	[20]	A	N,30.10.01
K1046	Drawing Description	[60]	A	N,30.10.01
K1047	Basic drawing number	[20]	A	N,30.10.01
K1051	Contractor Number Text	[20]	A	
K1052	Contractor Description	[40]	A	
K1053	Contract	[40]	A	or K0053
K1054	Contractor Number	[5]	I5	C,12.6.97
K1061	Customer Number Text	[20]	A	
K1062	Customer Description	[40]	A	
K1063	Customer Number	[5]	I5	
K1071	Supplier Number Text	[20]	A	
K1072	Supplier Description	[40]	A	
K1073	Supplier Number	[5]	I5	
K1081	Machine Number Text	[24]	A	or K0010 / K2301 (N,12.6.97)
K1082	Machine Description	[40]	A	or K0010 / K2302 (N,12.6.97)
K1083	Machine Number	[5]	I5	N,12.6.97
K1085	Machine Location	[40]	A	or K0010 (N,12.6.97)
K1086	Work Cycle / Operation	[40]	A	or K2311 (N,12.6.97)
K1087	Work Cycle Description	[40]	A	or K2312 (N, ME6)

Key	Field description	Length	Type	Remarks
K1100	Area / Plant sector	[40]	A	N,12.6.97
K1101	Department	[40]	A	N,12.6.97
K1102	Workshop	[40]	A	N,26.11.97
K1103	Cost centre	[40]	A	N,26.10.98
K1104	Shift	[20]	A	N,26.10.98
K1110	Order number	[20]	A	N,26.10.98
K1111	Goods received number	[20]	A	N,26.10.98
K1201	Test Facility Number Text	[24]	A	or K2401
K1202	Test Facility Description	[40]	A	or K2402
K1203	Reason for Test	[80]	A	
K1204	Test Begin	[20]	D	C,12.6.97
K1205	Test End	[20]	D	C,12.6.97
K1206	Test Location	[40]	A	or K1201 (N,12.6.97)
K1208	Test Facility Number	[5]	I5	N,12.6.97
K1209	Inspection type (inspection identifier)	[20]	A	see K0015 (N, 26.10.98)
K1210	Measurement type	[5]	I5	N,26.01.00
K1211	Standard master number (Text)	[20]	A	N,26.10.98
K1212	Standard master description	[40]	A	N,26.10.98
K1215	Standard master number	[5]	I5	N,26.10.98
K1221	Inspector number (Text)	[20]	A	N,26.10.98
K1222	Inspector name	[40]	A	N,26.10.98
K1223	Inspector number	[5]	I5	N,26.10.98
K1230	Gage room	[40]	A	N,26.10.98
K1231	Measurement program number	[20]	A	N,26.10.98
K1232	Measurement program version	[20]	A	N,26.10.98
K1301	Client	[5]	I5	N,30.10.01
K1302	Test batch	[40]	A	N,30.10.01

Key	Field description	Length	Type	Remarks
K1303	Plant	[40]	A	see K1100 (N, 26.1.00)
K1311	Production order	[40]	A	N,30.10.01
K1341	Test Plan Number Text	[20]	A	N,30.10.01
K1342	Test Plan Name	[40]	A	N,30.10.01
K1343	Test Plan Creation Date	[20]	A	N,30.10.01
K1344	Test Plan Creator	[40]	A	N,30.10.01
K1350	Output report file	[50]	A	N,2.9.02; Module ISR
K1800	user field description 1	[50]	A	N,26.10.98
K1801	user field type 1	[1]	A	No selection field! (N, 26.10.98)
K1802	user field content 1	[255]	A	No selection field! (N, 26.10.98)
K1810	user field description 2	[50]	A	No selection field! (N, 26.10.98)
K1811	user field type 2	[1]	A	No selection field! (N, 26.10.98)
K1812	user field content 2	[255]	A	No selection field! (N, 26.10.98)
K1820	user field description 3	[50]	A	No selection field! (N, 26.10.98)
K1821	user field type 3	[1]	A	No selection field! (N, 26.10.98)
K1822	user field content 3	[255]	A	No selection field! (N, 26.10.98)
K1830	user field description 4	[50]	A	No selection field! (N, 26.10.98)
K1831	user field type 4	[1]	A	No selection field! (N, 26.10.98)
K1832	user field content 4	[255]	A	No selection field! (N, 26.10.98)

Key	Field description	Length	Type	Remarks
K1840	user field description 5	[50]	A	No selection field! (N, 26.10.98)
K1841	user field type 5	[1]	A	No selection field! (N, 26.10.98)
K1842	user field content 5	[255]	A	No selection field! (N, 26.10.98)
K1850	user field description 6	[50]	A	No selection field! (N, 26.10.98)
K1851	user field type 6	[1]	A	No selection field! (N, 26.10.98)
K1852	user field content 6	[255]	A	No selection field! (N, 26.10.98)
K1860	user field description 7	[50]	A	No selection field! (N, 26.10.98)
K1861	user field type 7	[1]	A	No selection field! (N, 26.10.98)
K1862	user field content 7	[255]	A	No selection field! (N, 26.10.98)
K1870	user field description 8	[50]	A	No selection field! (N, 26.10.98)
K1871	user field type 8	[1]	A	No selection field! (N, 26.10.98)
K1872	user field content 8	[255]	A	No selection field! (N, 26.10.98)
K1880	user field description 9	[50]	A	No selection field! (N, 26.10.98)
K1881	user field type 9	[1]	A	No selection field! (N, 26.10.98)
K1882	user field content 9	[255]	A	No selection field! (N, 26.10.98)

Key	Field description	Length	Type	Remarks
K1890	user field description 10	[50]	A	No selection field! (N, 26.10.98)
K1891	user field type 10	[1]	A	No selection field! (N, 26.10.98)
K1892	user field content 10	[255]	A	No selection field! (N, 26.10.98)
K1900	Remark	[255]	A	C,12.6.97
K1997	Part GUID			N, ME 5
K1998	Internal qs-STAT configuration on the parts level (reserved)	[255]	A	N,27.4.99
K2001	Characteristic Number	[20]	A	
K2002	Characteristic Description	[80]	A	
K2003	Characteristic Abbreviation	[20]	A	
K2004	Characteristic Type	[5]	I5	Defined field contents (e.g. variable, attribute, ELS etc.); C, 29.11.00
K2005	Characteristic Class	[5]	I5	Classes: 0,1,2,3,4
K2006	Control Item	[5]	I5	Defined field contents
K2007	Control Type	[5]	I5	Defined field contents
K2008	Group type	[5]	I5	Defined field contents (C,9.12.02). Also see K5000 (multivariate characteristics)
K2009	Measured quantity	[5]	I5	Defined field contents (N,30.10.01). Identifier for the type of the characteristic (e.g. Length, Form, Position etc.)
K2011	Saved distribution	[5]	I5	Defined field contents
K2013	Natural Class width	[22]	F	natural class width for variable-classified characteristics
K2015	Tool wear type (Trend)	[3]	I3	Defined field contents; N, ME5

Key	Field description	Length	Type	Remarks
K2016	100% Measurement	[3]	I3	Defined field contents; N, ME5
K2021	Logical Operation Formula	[255]	A	formula for calculation of values of a characteristic from values of other characteristics. Ex.: m1+m2 (addition of two characteristics.)
K2022	Decimal Places	[5]	I5	number of decimal places in value recording
K2023	Transformation Type	[3]	I3	
K2024	Transformation Parameter a	[22]	F	
K2025	Transformation Parameter b	[22]	F	
K2026	Transformation Parameter c	[22]	F	
K2027	Transformation Parameter d	[22]	F	
K2028	Natural distribution	[3]	I3	N,08.11.01
K2030	Group Number / ELS-Number	[5]	I5	Only for simple groupings, otherwise see K5000
K2031	Group Element Number / ELS Number for error type of a ELS	[5]	I5	Only for simple groupings, otherwise see K5000
K2035	Calibration Date	[---]	D	
K2041	Recording Type	[3]	I3	flag: chosen recording type: manual or serial interface
K2042	Recording Device Number	[5]	I5	
K2043	Recording Device Name	[40]	A	
K2044	Recording Device Index	[5]	I5	
K2045	Recording Channel	[3]	I3	
K2046	Recording Subchannel	[3]	I3	
K2047	Software Requirement Index	[3]	I3	N,12.6.97
K2048	Takeover Channel	[3]	I3	N,26.10.98
K2049	Channel Initialization-Index	[3]	I3	
K2051	Interface	[3]	I3	

Key	Field description	Length	Type	Remarks
K2052	Baud Rate	[5]	I5	
K2053	IRQ Number	[3]	I3	
K2054	Parity	[3]	I3	
K2055	Data bits	[3]	I3	
K2056	Stop bits	[3]	I3	
K2060	Events Catalog (action code)	[5]	I5	Required for use of K0005 (C, 12.6.97)
K2061	Process Parameter Catalog	[5]	I5	Required for use of K0011
K2071	Accumulating Constant	[22]	F	for linear transformation when entering values according to a formula value = K2072 * input + K2071
K2072	Multiplication factor	[22]	F	
K2073	Dimension of the calibration master	[22]	F	
K2074	Actual offset for calibration measurements	[22]	F	
K2075	Amplification factor for calibration measurements	[22]	F	
K2076	Calibration Date	[---]	D	
K2080	Characteristic status (activated, deactivated)	[5]	W	Defined field contents
K2091	Characteristic index	[20]	A	N,26.10.98
K2092	Characteristic text	[50]	A	N,26.10.98
K2093	Processing status	[80]	A	N,26.10.98
K2095	Element Code	[40]	A	N,26.10.98
K2096	Element Index	[20]	A	N,26.10.98
K2097	Element Text	[50]	A	N,26.10.98
K2098	Element address	[20]	A	N,26.10.98

Key	Field description	Length	Type	Remarks
K2100	Target Value	[22]	F	objective measure; for attribute characteristics use Ptarget as absolute value (e.g. 0.001)
K2101	Nominal Value	[22]	F	drawing measure, nominal value will be referred to when calculating the specification limits from the entered allowance
K2102	Pmax	[22]	F	C,12.6.97/for Cpk values with attribute characteristics
K2103	Tolerance class	[2]	A	N,30.10.01
K2104	Tolerance value	[3]	I3	N,30.10.01
K2105	Parts OK at Censoring	[5]	I5	N,7.1.98; Module RB
K2106	Extended measurement uncertainty	[22]	F	N,08.11.01
K2110	Lower Limit Value	[22]	F	
K2111	Upper Limit Value	[22]	F	
K2112	Lower Allowance	[22]	F	N,12.6.97
K2113	Upper Allowance	[22]	F	N,12.6.97
K2114	Lower Scrap Limit	[22]	F	N,12.6.97
K2115	Upper Scrap Limit	[22]	F	N,12.6.97
K2120	Lower Limit type	[3]	I3	Defined field contents Natural boundary or limit
K2121	Upper Limit type	[3]	I3	Defined field contents Natural boundary or limit
K2130	Lower Plausibility Limit	[22]	F	
K2131	Upper Plausibility Limit	[22]	F	
K2135	Lower Class Limit	[22]	F	
K2136	Upper Class Limit	[22]	F	
K2137	Number of Classes	[3]	I3	
K2138	Classification source	[3]	I3	N,08.11.01

Key	Field description	Length	Type	Remarks
K2139	Classification Model source	[3]	I3	N,08.11.01
K2141	Unit	[5]	I5	number of selected unit (e.g. from catalogs)
K2142	Unit Description	[20]	A	Text
K2143	Unit relative axis	[20]	A	N,5.2.98
K2144	Addition constant relative axis	[22]	F	N,5.2.98
K2145	Multiplication factor relative axis	[22]	F	N,5.2.98
K2146	Decimal places relative axis	[3]	I3	N,30.10.01
K2151	Tolerance (as Text)	[20]	A	
K2152	Calculated Tolerance	[22]	F	N,12.6.97
K2160	Batch size	[5]	I5	
K2161	Re-work cost	[22]	F	cost for parts to be re- worked
K2162	Rejects cost	[22]	F	
K2163	Error cost	[22]	F	
K2170	Censoring point in Time	[22]	F	N,7.1.98; Module RB
K2171	Extrapolation	[22]	F	N,7.1.98; Module RB
K2172	Permitted failure rate	[22]	F	N,27.11.01; Module RB
K2173	Failure free time	[22]	F	N,08.11.01; Module RB
K2174	Parts in the field	[3]	I3	N, ME5
K2175	Conditions for frequency sums	[3]	I3	N, ME5
K2176	Life distance after Eckel	[3]	I3	N, ME5
K2177	Life time X1	[22]	F	N, ME5
K2178	Life time X2	[22]	F	N, ME5
K2180	Weibull Parameter b	[22]	F	N, ME5
K2181	Weibull Parameter T	[22]	F	N, ME5
K2182	Sum probability (B(x1))	[22]	F	N, ME5
K2183	Sum probability (B(x2))	[22]	F	N, ME5

Key	Field description	Length	Type	Remarks
K2185	Number of parts in the field (for Eckel method)	[10]	I10	N, ME5
K2186	Usage time for parts in the field (for Eckel method)	[22]	F	N, ME5
K2201	Process Variation	[22]	F	Module GC
K2202	Evaluation Type	[3]	I3	Defined field contents (e.g. Type 1, Type 2 etc. - see chapter 4.1)
K2205	Number of parts	[5]	I5	Module GC
K2211	Master Number Text:	[40]	A	C,3.7.97
K2212	Master Description	[40]	A	
K2213	Master Actual Value	[22]	F	Module GC Type 1
K2214	Master Temperature	[22]	F	
K2215	Master Number	[5]	I5	
K2216	Master –Serial number	[20]	A	N, 26.10.98
K2217	Master Manufacturer	[80]	A	
K2220	Number of Operators	[5]	I5	Module GC
K2221	Number of Trials	[5]	I5	for Type 2-Study (Measurements per operator and part e.g. 2), for Type 3-Study Number of measurements
K2222	No. of Reference Measurements	[5]	I5	N,8.7.98; Module GC
K2225	Determined Cg value	[22]	F	N,12.6.97
K2226	Determined Cgk value	[22]	F	N,12.6.97
K2227	Deviation GC Type 3 – GC Type 1	[22]	F	N,12.6.97; module GC CNOMO
K2228	Sg Type 1 - Stability	[22]	F	N, 29.11.00; module GC Stability
K2229	Calibration uncertainty of the master	[22]	F	C, 24.07.01/N, 29.11.00; module GC
K2230	Distribution parameter a for measurement uncertainty	[22]	F	N,08.11.01; Module GC

Key	Field description	Length	Type	Remarks
K2231	Distribution parameter b for measurement uncertainty	[22]	F	N,08.11.01; Module GC
K2232	Distribution parameter c for measurement uncertainty	[22]	F	N,08.11.01; Module GC
K2233	Distribution parameter d for measurement uncertainty	[22]	F	N,08.11.01; Module GC
K2234	Independent Influence factor	[5]	I5	N,08.11.01; Module GC
K2235	Temperature constant of the part to be tested	[22]	F	N,08.11.01; Module GC
K2236	Temperature constant of the gage	[22]	F	N,08.11.01; Module GC
K2243	Drawing file name	[80]	A	
K2244	Drawing Reference point X	[5]	I5	N,26.11.97
K2245	Drawing Reference point Y	[5]	I5	N,26.11.97
K2246	Drawing Reference point Z	[5]	I5	N,30.10.01
K2251	Master actual value (lower tolerance)	[22]	F	N,26.10.98
K2252	Master actual value (upper tolerance)	[22]	F	N,26.10.98
K2261	Reference Part number	[40]	A	C, 24.11.03
K2262	Reference Part description	[40]	A	N, 26.10.98
K2263	Reference Part actual value	[22]	F	N, 26.10.98
K2264	Reference Part temperature	[22]	F	N, 26.10.98
K2265	Reference Part number (num)	[3]	I3	N, 26.10.98
K2266	Reference Part serial number	[40]	A	N, 26.10.98
K2281	Calibration Part Number middle	[40]	A	N, 26.10.98
K2282	Calibration Part Description middle	[40]	A	N, 26.10.98
K2283	Calibration Part actual value middle	[22]	F	N, 26.10.98
K2284	Calibration Part temperature middle	[22]	F	N, 26.10.98

Key	Field description	Length	Type	Remarks
K2285	Calibration Part number (num) middle	[3]	I3	N, 26.10.98
K2286	Calibration Part serial number middle	[40]	A	N, 26.10.98
K2301	Machine Number Text	[20]	A	or K1081 / K0010
K2302	Machine Description	[40]	A	or K1082 / K0010
K2303	Department / Cost center	[40]	A	or K1103
K2304	Machine Location	[40]	A	
K2305	Machine Number	[5]	I5	
K2306	Area / Plant sector	[40]	A	N,3.7.97
K2307	PTM Number	[40]	A	N,3.7.97
K2311	Production Type Text (Operation)	[20]	A	or K1086
K2312	Production Type Description	[40]	A	or K1086
K2313	Production Type Number	[5]	I5	
K2320	Contract Number	[20]	A	
K2321	Contractor Number Text	[20]	A	
K2322	Contractor Name	[40]	A	
K2323	Contractor Number	[5]	I5	
K2331	Work piece Number Text	[20]	A	C,12.6.97
K2332	Work piece Description	[40]	A	C,12.6.97
K2333	Work piece Number	[5]	I5	C,12.6.97
K2341	Test plan number Text	[20]	A	N,3.7.97
K2342	Test plan name	[40]	A	N,3.7.97
K2343	Test plan creation date	[20]	D	N,3.7.97
K2344	Test plan creator	[40]	A	N,3.7.97
K2401	Gage Number Text	[40]	A	or K1201 / K0012
K2402	Gage Description	[40]	A	or K1202 / K0012
K2404	Gage resolution	[22]	F	

Key	Field description	Length	Type	Remarks
K2405	Gage Number	[5]	I5	
K2406	Gage manufacturer	[40]	A	N,12.6.97
K2407	SPC device number	[20]	A	N,3.7.97
K2408	SPC device description	[20]	A	N,3.7.97
K2409	SPC device type	[20]	A	N,3.7.97
K2410	Test location	[40]	A	
K2411	Test Begin	[40]	D	
K2412	Test End	[40]	D	
K2415	Gage serial number	[20]	A	N, 26.10.98
K2416	Display device	[40]	A	N, 26.10.98
K2421	Operator Number Text	[20]	A	
K2422	Operator Name	[40]	A	
K2423	Operator Number	[5]	I5	
K2430	Sampling type	[5]	I5	N,2.9.02; Module ISR, defined field contents
K2432	Individual value output	[5]	I5	N,2.9.02; Module ISR, defined field contents
K2434	Proof of Process capability	[5]	I5	N,2.9.02; Module ISR, defined field contents
K2436	Test Frequency	[10]	A	N,26.8.02; Module ISR
K2438	Quantity Tested	[10]	A	N,26.8.02; Module ISR
K2440	Assembly Component	[40]	A	N,26.8.02; Module ISR
K2442	Assembly Component mass	[12]	A	N,26.8.02; Module ISR
K2444	Assembly Component material	[40]	A	N,26.8.02; Module ISR
K2446	Supplier's product description	[40]	A	N,26.8.02; Module ISR
K2448	Assembly Component manufacturer	[40]	A	N,26.8.02; Module ISR
K2501	Dimension attribute	[3]	I3	N,30.10.01; defined field contents

Key	Field description	Length	Type	Remarks
K2502	Tolerance display format	[3]	I3	N,30.10.01; defined field contents
K2503	Dimension type	[3]	I3	N,30.10.01; defined field contents
K2504	Drawing change status	[3]	I3	N,30.10.01; defined field contents
K2505	View description	[20]	A	N,30.10.01
K2506	Sheet number	[3]	I3	N,30.10.01
K2507	Drawing field character	[2]	A	N,30.10.01
K2508	Drawing field number	[3]	I3	N,30.10.01
K2509	Sheet description	[40]	A	N,24.09.02
K2511	Reference 1	[20]	A	N,30.10.01
K2512	Reference 2	[20]	A	N,30.10.01
K2513	Reference 3	[20]	A	N,30.10.01
K2514	Reference 4	[20]	A	N,30.10.01
K2515	Reference 5	[20]	A	N,30.10.01
K2516	Reference 6	[20]	A	N,30.10.01
K2517	Reference 7	[20]	A	N,30.10.01
K2518	Reference 8	[20]	A	N,30.10.01
K2519	Reference 9	[20]	A	N,30.10.01
K2520	Reference System	[20]	A	N,19.02.02
K2521	Reference x direction	[22]	F	N,19.02.02; Ä,27.06.03
K2522	Reference y direction	[22]	F	N,19.02.02; Ä,27.06.03
K2523	Reference z direction	[22]	F	N,19.02.02; Ä,27.06.03
K2524	CAD internal reference	[20]	A	N,19.02.02
K2630	Calibration Uncertainty	[22]	F	
K2800	user field description 1	[50]	A	N,26.10.98
K2801	user field type 1	[1]	A	N,26.10.98
K2802	user field contents 1	[255]	A	N,26.10.98

Key	Field description	Length	Type	Remarks
K2810	user field description 2	[50]	A	N,26.10.98
K2811	user field type 2	[1]	A	N,26.10.98
K2812	user field contents 2	[255]	A	N,26.10.98
K2820	user field description 3	[50]	A	N,26.10.98
K2821	user field type 3	[1]	A	N,26.10.98
K2822	user field contents 3	[255]	A	N,26.10.98
K2830	user field description 4	[50]	A	N,26.10.98
K2831	user field type 4	[1]	A	N,26.10.98
K2832	user field contents 4	[255]	A	N,26.10.98
K2840	user field description 5	[50]	A	N,26.10.98
K2841	user field type 5	[1]	A	N,26.10.98
K2842	user field contents 5	[255]	A	N,26.10.98
K2850	user field description 6	[50]	A	N,26.10.98
K2851	user field type 6	[1]	A	N,26.10.98
K2852	user field contents 6	[255]	A	N,26.10.98
K2860	user field description 7	[50]	A	N,26.10.98
K2861	user field type 7	[1]	A	N,26.10.98
K2862	user field contents 7	[255]	A	N,26.10.98
K2870	user field description 8	[50]	A	N,26.10.98
K2871	user field type 8	[1]	A	N,26.10.98
K2872	user field contents 8	[255]	A	N,26.10.98
K2880	user field description 9	[50]	A	N,26.10.98
K2881	user field type 9	[1]	A	N,26.10.98
K2882	user field contents 9	[255]	A	N,26.10.98
K2890	user field description 10	[50]	A	N,26.10.98
K2891	user field type 10	[1]	A	N,26.10.98
K2892	user field contents 10	[255]	A	N,26.10.98
K2900	Remark	[255]	A	Ä,12.6.97

Key	Field description	Length	Type	Remarks
K2901	Test Conditions	[80]	A	within Measurement System Analysis saving of test conditions in text form
K2902	Characteristic class specific additional texts			N, 21.07.04
K2997	Characteristic GUID		GUID	N, ME5
K2998	internal qs-STAT configuration	[255]	A	
K2999	internal qs-STAT configuration	[10]	I10	
K3001	Test Report Number Supplier	[20]	A	N,2.9.02; Module ISR
K3002	Test Report Description Supplier	[30]	A	N,2.9.02; Module ISR
K3003	ID number supplier	[20]	A	N,2.9.02; Module ISR
K3004	Test Report Version Supplier	[20]	A	N,2.9.02; Module ISR
K3005	Test Report Issue (Supplier)	[20]	A	N,2.9.02; Module ISR
K3006	Supplier Reference	[20]	A	N,2.9.02; Module ISR
K3010	Supplier Number	[5]	I5	N,2.9.02; Module ISR
K3011	Supplier Number	[20]	A	N,2.9.02; Module ISR
K3020	Initial Sampling	[5]	I5	N,2.9.02; Module ISR; defined field contents
K3021	Subsequent sampling	[5]	I5	N,2.9.02; Module ISR; defined field contents
K3022	Other samples	[5]	I5	N,2.9.02; Module ISR; defined field contents
K3023	Other samples Text	[40]	A	N,2.9.02; Module ISR
K3025	Repeat Presentation Number	[20]	A	N,2.9.02; Module ISR
K3030	Installations (test types)	[30]	A	N,2.9.02; Module ISR; defined field contents
K3031	Other installations (test types)	[40]	A	N,2.9.02; Module ISR
K3035	Reason for sampling	[50]	A	N,2.9.02; Module ISR; defined field contents
K3036	other - please specify	[40]	A	N,2.9.02; Module ISR
K3037	Requested submission level	[5]	I5	N,2.9.02; Module ISR; defined field contents

Key	Field description	Length	Type	Remarks
K3040	Process capability	[5]	I5	N,2.9.02; Module ISR; defined field contents
K3050	Identification number supplier	[30]	A	N,2.9.02; Module ISR
K3052	Designation supplier	[50]	A	N,2.9.02; Module ISR
K3055	Drawing number supplier	[20]	A	N,2.9.02; Module ISR
K3056	Status supplier	[20]	A	N,2.9.02; Module ISR
K3057	Date supplier	--	D	N,2.9.02; Module ISR
K3058	Modification number supplier	[20]	A	N,2.9.02; Module ISR
K3070	Order number supplier	[30]	A	N,2.9.02; Module ISR
K3071	Call number supplier	[30]	A	N,2.9.02; Module ISR
K3077	Order date supplier	--	D	N,2.9.02; Module ISR
K3078	Call date supplier	--	D	N,2.9.02; Module ISR
K3080	Delivery order number supplier	[30]	A	N,2.9.02; Module ISR
K3087	Delivery order date supplier	--	D	N,2.9.02; Module ISR
K3100	Article number	[30]	A	N,2.9.02; Module ISR
K3101	Quantity supplied	[20]	A	N,2.9.02; Module ISR
K3102	Delivery unit	[20]	A	N,2.9.02; Module ISR
K3103	Number of samples	[20]	A	N,2.9.02; Module ISR
K3105	batch number	[20]	A	N,2.9.02; Module ISR
K3106	Cavity number	[20]	A	N,2.9.02; Module ISR
K3107	Tool number	[20]	A	N,2.9.02; Module ISR
K3108	Restricted Substances	[5]	I5	N,2.9.02; Module ISR; defined field contents
K3109	Plastic Parts	[5]	I5	N,2.9.02; Module ISR; defined field contents
K3110	Sample weight (supplier)	[20]	A	N,2.9.02; Module ISR
K3112	carried out	[30]	A	N,2.9.02; Module ISR; defined field contents
K3113	Application	[30]	A	N,2.9.02; Module ISR

Key	Field description	Length	Type	Remarks
K3115	Control item	[5]	I5	N,2.9.02; Module ISR; defined field contents
K3117	Checking Aid No.	[20]	A	N,2.9.02; Module ISR
K3118	Change Level (Checking Aid No.)	[20]	A	N,2.9.02; Module ISR
K3119	Date (Checking Aid No.)	--	D	N,2.9.02; Module ISR
K3150	Creator (supplier)	[5]	I5	N,2.9.02; Module ISR
K3160	Signature Creator	[30]	A	N,2.9.02; Module ISR
K3167	Date Creator Signature	--	D	N,2.9.02; Module ISR
K3180	Production rate / 8 hours	[1023]	M	N,2.9.02; Module ISR
K3187	Mold / Cav. / Prod.	[20]	A	N,2.9.02; Module ISR
K3188	Creator (supplier)	[20]	A	N,2.9.02; Module ISR
K3190	Remark supplier	[1023]	M	N,2.9.02; Module ISR
K3200	Production order number	[30]	A	N,2.9.02; Module ISR
K3210	Test order number	[30]	A	N,2.9.02; Module ISR
K3281	Remark functional test (supplier)	[1023]	M	N,2.9.02; Module ISR
K3282	Remark dimensional test (supplier)	[1023]	M	N,2.9.02; Module ISR
K3283	Remark material test (supplier)	[1023]	M	N,2.9.02; Module ISR
K3284	Remark Reliability study	[1023]	M	N,10.10.02; Module ISR
K3285	Remark Process capability study	[1023]	M	N,10.10.02; Module ISR
K3293	Remark appearance	[1023]	M	N,10.10.02; Module ISR
K3296	Remark Components	[1023]	M	N,10.10.02; Module ISR
K3298	Remark attribute test	[1023]	M	N,10.10.02; Module ISR
K3301	Test report number customer	[20]	A	N,2.9.02; Module ISR
K3302	Test report description customer	[30]	A	N,2.9.02; Module ISR
K3303	Identification number customer	[20]	A	N,2.9.02; Module ISR
K3304	Test report version customer	[20]	A	N,2.9.02; Module ISR
K3306	Reference customer	[20]	A	N,2.9.02; Module ISR

Key	Field description	Length	Type	Remarks
K3310	Customer number	[5]	I5	N,2.9.02; Module ISR
K3350	Classification number customer	[30]	A	N,2.9.02; Module ISR
K3352	Designation customer	[50]	A	N,2.9.02; Module ISR
K3355	Drawing number customer	[20]	A	N,2.9.02; Module ISR
K3356	Status customer	[20]	A	N,2.9.02; Module ISR
K3357	Date acceptance	--	D	N,2.9.02; Module ISR
K3358	Amendment number customer	[20]	A	N,2.9.02; Module ISR
K3372	Incoming goods number	[30]	A	N,2.9.02; Module ISR
K3379	Incoming goods date	--	D	N,2.9.02; Module ISR
K3380	Delivery note number customer	[20]	A	N,2.9.02; Module ISR
K3387	Delivery note date customer	--	D	N,2.9.02; Module ISR
K3390	Discharge location	[30]	A	N,2.9.02; Module ISR
K3404	Acceptance procedure	[30]	A	N,2.9.02; Module ISR
K3410	Sample weight customer	[20]	A	N,2.9.02; Module ISR
K3420	Overall decision	[5]	I5	N,2.9.02; Module ISR; defined field contents
K3421	Decision functional test	[5]	I5	N,2.9.02; Module ISR; defined field contents
K3422	Decision dimensional test	[5]	I5	N,2.9.02; Module ISR; defined field contents
K3423	Decision material test	[5]	I5	N,2.9.02; Module ISR; defined field contents
K3424	Decision Reliability	[5]	I5	N,2.9.02; Module ISR; defined field contents
K3425	Decision Process Capability	[5]	I5	N,2.9.02; Module ISR; defined field contents
K3433	Decision visual test	[5]	I5	N,2.9.02; Module ISR; defined field contents
K3436	Decision Components	[5]	I5	N,10.10.02; Module ISR; defined field contents
K3438	Decision attribute test	[5]	I5	N,2.9.02; Module ISR; defined field contents

Key	Field description	Length	Type	Remarks
K3439	other decision	[20]	A	N,2.9.02; Module ISR
K3440	The Results for	[20]	A	N,2.9.02; Module ISR; defined field contents
K3442	meet all drawing and specif. requmts.	[5]	I5	N,2.9.02; Module ISR; defined field contents
K3445	Deviation Permit Number	[50]	A	N,2.9.02; Module ISR
K3447	Date (Additional Engineering Changes)	--	D	N,2.9.02; Module ISR
K3450	Test Report Creator (Customer)	[50]	A	N,2.9.02; Module ISR
K3451	Name Customer	[20]	A	N,2.9.02; Module ISR
K3460	Signature Customer	[20]	A	N,2.9.02; Module ISR
K3467	Signature date customer	--	D	N,2.9.02; Module ISR
K3470	Buyer	[5]	I5	N,2.9.02; Module ISR
K3481	Conditions	[1023]	M	N,2.9.02; Module ISR
K3490	Remark Customer	[1023]	M	N,2.9.02; Module ISR
K3560	Name of inspection facility	[30]	A	N,2.9.02; Module ISR
K3561	Functional inspection facility	[30]	A	N,2.9.02; Module ISR
K3562	Dimensional inspection	[30]	A	N,2.9.02; Module ISR
K3563	Material inspection facility	[30]	A	N,2.9.02; Module ISR
K3564	(spare for:) Reliability, inspection facility	[30]	A	N,2.9.02; Module ISR
K3565	(spare for:) Visual test, inspection facility	[30]	A	N,2.9.02; Module ISR
K3566	(spare for:) Attribute test, inspection	[30]	A	N,2.9.02; Module ISR
K3569	(spare for:) Misc. test, inspection facility	[30]	A	N,2.9.02; Module ISR
K3581	Remark Functional Test (customer)	[1023]	M	N,2.9.02; Module ISR
K3582	Remark Dimensional Test (customer)	[1023]	M	N,2.9.02; Module ISR
K3583	Remark Material Test (customer)	[1023]	M	N,29.8.02; Module ISR

Key	Field description	Length	Type	Remarks
K3600	Test Report Type	[5]	I5	N,2.9.02; Module ISR
K3601	Test Report Name/Description	[30]	A	N,2.9.02; Module ISR
K3602	Input Mask File	[50]	A	N,2.9.02; Module ISR
K3610	Modified by	[50]	A	N,2.9.02; Module ISR
K3617	Modification Date	--	D	N,2.9.02; Module ISR
K3650	Processing Status of the Initial Sample	[3]	I3	N, ME5; Module ISR
K3701	Distribution List 1	[5]	I5	N,2.9.02; Module ISR; defined field contents
K3702	Distribution List 2	[5]	I5	N,2.9.02; Module ISR; defined field contents
K3703	Distribution List 3	[5]	I5	N,2.9.02; Module ISR; defined field contents
K3704	Distribution List 4	[5]	I5	N,2.9.02; Module ISR; defined field contents
K3705	Distribution List 5	[5]	I5	N,2.9.02; Module ISR; defined field contents
K3706	Distribution List 6	[5]	I5	N,2.9.02; Module ISR; defined field contents
K3707	Distribution List 7	[5]	I5	N,2.9.02; Module ISR; defined field contents
K3708	Distribution List 8	[5]	I5	N,2.9.02; Module ISR; defined field contents
K3709	Distribution List 9	[5]	I5	N,2.9.02; Module ISR; defined field contents
K3710	Distribution List 10	[5]	I5	N,2.9.02; Module ISR; defined field contents
K3711	Distribution List 11	[5]	I5	N,2.9.02; Module ISR; defined field contents
K3712	Distribution List 12	[5]	I5	N,2.9.02; Module ISR; defined field contents
K3713	Distribution List 13	[5]	I5	N,2.9.02; Module ISR; defined field contents

Key	Field description	Length	Type	Remarks
K3714	Distribution List 14	[5]	I5	N,2.9.02; Module ISR; defined field contents
K3750	Hazardous Material acc. to ChemG/GefStoffV?	[5]	I5	N,2.9.02; Module ISR; defined field contents
K3752	Build-up of hazardous material with proper handling?	[5]	I5	N,2.9.02; Module ISR; defined field contents
K3754	Dangerous Goods per Traffic Law	[5]	I5	N,2.9.02; Module ISR; defined field contents
K3756	Water Endangering Goods per Water Act	[5]	I5	N,2.9.02; Module ISR; defined field contents
K3757	Water Endangering Class	[20]	A	N,2.9.02; Module ISR
K3758	Quantity of Water Endangering Goods	[20]	A	N,2.9.02; Module ISR
K3760	Component with Biocides	[5]	I5	N,2.9.02; Module ISR; defined field contents
K3761	Biocides Level	[50]	A	N,2.9.02; Module ISR
K3763	Does disposal result in waste with EWC code?	[5]	I5	N,2.9.02; Module ISR; defined field contents
K3764	EWC code	[20]	A	N,2.9.02; Module ISR
K5001	Group number (text)	[30]	A	N,29.11.01; For grouping of characteristics as replacement of K2030 / K2031
K5002	Group description	[80]	A	For grouping of characteristics as replacement of K2030 / K2031
K5003	Group short description	[20]	A	N,29.11.01; For grouping of characteristics as replacement of K2030 / K2031
K5007	Group number-short description	[20]	A	N,29.11.01
K5045	Sketch file name	[80]	A	N,29.11.01
K5090	Remark	[255]	A	N,29.11.01
K5098	internal qs-STAT configuration	[254]	A	

Key	Field description	Length	Type	Remarks
K5101	Part as part of a group	[5]	I5	N,29.11.01; For grouping of characteristics as replacement of K2030 / K2031
K5102	Characteristic as part of a group	[5]	I5	N,29.11.01; For grouping of characteristics as replacement of K2030 / K2031
K5103	Group as part of a group	[5]	I5	N,29.11.01; For grouping of characteristics as replacement of K2030 / K2031
K5111	Part element	[5]	I5	N,29.11.01; For grouping of characteristics as replacement of K2030 / K2031
K5112	Characteristic element	[5]	I5	N,29.11.01; For grouping of characteristics as replacement of K2030 / K2031
K5113	Group element	[5]	I5	N,29.11.01; For grouping of characteristics as replacement of K2030 / K2031
K8006	Lower alarm limit (location)	[22]	F	N,12.6.97
K8007	Upper alarm limit (location)	[22]	F	N,12.6.97
K8010	Chart Type and additional attributes (location)	[---]	S	C,12.6.97; defined field contents
K8011	Central Position (location)	[22]	F	C,12.6.97
K8012	Lower Control Limit LCL (location)	[22]	F	C,12.6.97
K8013	Upper Control Limit UCL (location)	[22]	F	C,12.6.97
K8014	Lower Warning Limit LWL (location)	[22]	F	C,12.6.97
K8015	Upper Warning Limit UWL (location)	[22]	F	C,12.6.97
K8106	Lower Alarm limit (variation)	[22]	F	N,12.6.97

Key	Field description	Length	Type	Remarks
K8107	Upper Alarm limit (variation)	[22]	F	N,12.6.97
K8110	Chart Type and additional attributes (variation)	[---]	S	C,12.6.97; defined field contents
K8111	Central Position (variation)	[22]	F	C,12.6.97
K8112	Lower Control limit LCL (variation)	[22]	F	C,12.6.97
K8113	Upper Control Limit UCL (variation)	[22]	F	C,12.6.97
K8114	Lower Warning Limit LWL (variation)	[22]	F	C,12.6.97
K8115	Upper Warning Limit UWL (variation)	[22]	F	C,12.6.97
K8500	Subgroup size (total)	[5]	I5	-
K8501	Subgroup type	[3]	I3	Defined field contents (fixed, moving)
K8502	Subgroup frequency	[40]	A	C,12.6.97/text indication of frequency
K8503	stable subgroup size	[3]	I3	Defined field contents (only for attribute tests)
K8504	Subgroup frequency	[5]	I5	N,3.7.97
K8505	Number of parts (attribute)	[5]	I5	Only for attribute tests - target; actual scope K0020
K8506	Attribute subgroup size	[5]	I5	-
K8510	Cp value	[22]	F	-
K8511	Cpk value	[22]	F	C,12.6.97
K8520	required Cpk value	[22]	F	N,12.6.97
K8521	required Cp value	[22]	F	N,12.6.97
K8522	fixed Cpk value	[22]	F	N,3.7.97
K8523	fixed Cp value	[22]	F	N,3.7.97
K8524	required CAM value	[22]	F	
K8525	Required non-critical Capability Index	[22]	F	

Key	Field description	Length	Type	Remarks
K8530	Process Stability	[5]	I5	N,2.9.02; Module ISR; defined field contents
K8531	Recorded Process Capability (Cp)	[22]	F	N,26.8.02; Module ISR
K8532	Recorded Process Capability (Cpk)	[22]	F	N,26.8.02; Module ISR
K8540	Evaluation	[5]	I5	N,26.8.02; Module ISR
K8600	Correction Strategy	[3]	I3	Valid for post-process measurement systems
K8610	Lower Correction Limit	[22]	F	Valid for post-process measurement systems
K8611	Upper Correction Limit	[22]	F	Valid for post-process measurement systems
K8612	Buffer size	[3]	I3	Valid for post-process measurement systems
K8613	Correction target value	[22]	F	Valid for post-process measurement systems

8.2 Fields with defined field contents

Note: You can find the standards for the evaluation method of the Measurement System Analysis (**K2202**) as well as for the quality control chart (**K8010/K8110**) in the corresponding sections of this manual.

For all selectable fields (**K2432, K2434, K3020, K3021, K3022, K3108, K3109, K3115, K3442, K3701-K3714, K3750, K3752, K3754, K3756, K3760, K3763**) usually the following field contents are determined:

Value	Description
0	not selected
1	selected

8.2.1 Reason for Test K0015

Value	Description
0	Continuous measurements
10	Special measurement
20	Audit measurement

8.2.2 Control Item K1010/K2006

Value	Description
0	No
1	Yes

8.2.3 Characteristics Type K2004

Value	Description
0	variable
1	attribute
2	variable classified
5	error type
6	error log sheet

8.2.4 Characteristics Class K2005

Value	Description
0	unimportant
1	little important
2	important
3	significant
4	critical

8.2.5 Control Type K2007

Value	Description
0	no control
1	conditional control
2	manual
3	automatic control

8.2.6 Group Type K2008

Value	Description
0	No group / Coordinate
1	Logical group
2	Positional tolerance
3	Measurement Uncertainty (Measurement system analysis)
4	Extrapolation (Reliability analysis)
5	Separation (according to additional data)
6	Error Log Sheet
7	
8	
9	Superimposed group (BFM)

8.2.7 Measured quantity K2009

Value	Description
0	Undefined
100	straightness
101	flatness
102	circularity
103	cylindricity

Value	Description
104	profile
105	profile of a line
106	angularity
107	perpendicularity
108	parallelism
109	true position
110	concentricity
111	symmetry
112	runout
113	total runout
114	CompCoaxial
115	CompPattern
117	Coordinates
118	Surface runout
150	Max. profile height Rz
151	Total profile height Rt
152	deviation assessed prof. Ra
153	Max. profile height Pt
154	Core roughness depth Rk
155	Red. height of centers
156	Red. score depth
157	Profile Wave depth Wt
158	Maximum Wave depth
160	Material proportion Pmr
161	Material proportion Mr1
162	Material proportion Mr2
200	distance
201	radius
202	diameter
203	angle
204	ellipsis minor
205	ellipsis major
206	cone angle
210	Spherical measuring rod
211	Depth / height of tooth
220	Spring rate
250	temperature [°C]
251	temperature [F]
255	pressure [bar]
260	coating thickness
270	volume

Value	Description
280	mass
282	force
285	hardness
290	viscosity
300	unbalance
301	torque
501	resistance
502	capacity
503	inductivity
504	phase shift
505	frequency
506	Amperage
507	voltage
508	output
509	field intensity
601	Pitch
602	Pitch error
604	Cumulative pitch bias
605	Cumulative pitch error
607	Total pitch error
620	Line
621	Formal line error
630	Profile
631	Formal profile error
632	Profile angle bias
633	Profile wobble
640	Tip relief
641	Profile crowning
642	Crowning
643	Crowning height
651	Flank line angle bias
652	Flank line wobble
660	Radial run-out bias
662	Wobble
663	Coaxiality

8.2.8 Distribution Type K2011

Value	Description
1	normal distribution
2	log. normal distribution
4	root transformed normal distribution
11	folded normal distribution [0]
12	Raleigh distribution [0]
21	folded normal distribution [$<> 0$]
22	Raleigh distribution [$<> 0$]
30	Weibull distribution
91	Johnson transformation
92	mixed distribution
99	Pearson distribution system
100	binomial distribution
200	Poisson distribution

8.2.9 Tool Wear Type K2015

Value	Description
0	Undefined
1	Ascending
2	Descending

8.2.10 100% Measurement K2016

Value	Description
0	No
1	Yes

8.2.11 Characteristics Status K2080

Value	Description
0	Activated
1	Deactivated

8.2.12 Type of Limit K2120/K2121

Value	Description
0	no limit
1	limit value
2	natural limit

8.2.13 Study Types K2430, K3030 und K3440

The fields K3030 and K3440 may contain lists of the following values, which must be separated by commas.

A characteristic may be allocated to one study type only, field K2430 may contain one record only.

Value	Description
1	Functional study
2	Dimensional study
3	Material study
4	Reliability study
5	Process capability study
6	Process flow chart
7	Gage capability study
8	Gage list
9	EC data security sheet
10	Haptics
11	Acoustics
12	Scent
13	Appearance
14	Certificates
15	Design release
16	Material composition of purchase parts
17	Others
18	Material and functional test

8.2.14 Dimensional Attribute K2501

Value	Description
0	no record
1	basic dimension
2	test dimension

8.2.15 Tolerance Display Format K2502

Value	Description
0	nominal (10 H7)
1	limits (9,9-10,1)
2	plus minus (10 +/-0,1 upper dimension may differ from lower, i.e. 10 +0.2 – 0,1)
3	PlusMinusSymbol (upper and lower dimension equal, e.g. 10 +/- 0.1)

8.2.16 Dimensional Type K2503

Value	Description
0	undefined
1	drawing dimension
2	model dimension
3	reference dimension

8.2.17 Drawing Modification Status K2504

Value	Description
0	no modification (compared to last drawing)
1	modified characteristic (compared to last drawing)
2	new characteristic (compared to last drawing)
3	deleted characteristic

8.2.18 Reason for Sampling K3035

Field K3035 may contain a list of the following values, with the values separated by commas.

Value	Description
1	New part
2	Product change
3	Production relocation
4	Change in production procedures
5	Long-term suspension of production
6	New subcontractor
7	Product with DmbA
8	Production / Test plan created
9	FMEA carried out
10	Changed specification
11	Changed production conditions
12	Initial Submission
13	Tooling: Transfer, Replacement, Refurbishment or additional
14	Correction of Discrepancy
15	Change to Optional Construction or Material
16	Change in Part Processing
17	Other - please specify

8.2.19 Submission Level K3037

Value	Description
1	Level 1
2	Level 2
3	Level 3
4	Level 4
5	Level 5

8.2.20 Calculated Process Capability Type K3040

Value	Description
1	Expected process capability
2	Preliminary process capability
3	Process capability in the series

8.2.21 Executed Study K3112

Field K3112 may contain a list of the following values, which must be separated by commas.

Value	Description
1	Controlled drawings
2	Material test results
3	Control plan
4	Additional drawings / sketches
5	Certificates
6	Proof of process capability
7	Exact number of sample parts
8	Functional test results
9	Production procedure chart
10	Dimensional results
11	Product development authorization
12	Proof of gage capability
13	FMEA
14	Self-certifying supplier

8.2.22 Overall Decision and Decisions Regarding Individual Studies K3420-K3438

Value	Description
1	released
2	released with conditions imposed
3	rejected, new samples required
4	rejected, may be used up taking measures
5	rejected
6	other

8.2.23 Subgroup Type K8501

Value	Description
0	fixed
1	moving

K8501 is to be used only along with K8500 (subgroup size).

8.2.24 Subgroup Type attribute K8503

Value	Description
0	variable
1	constant

8.2.25 Process stability K8530

Value	Description
1	stable
2	unstable

8.3 Catalog Fields

The catalogs listed below may be defined individually by the user.

Key	Field Name	Length	Type	Remarks
K4000	Customer catalog	[80]	A	
K4002	Customer number	[20]	A	
K4003	Customer name 1	[80]	A	
K4004	Customer name 2	[80]	A	
K4005	Customer department	[50]	A	
K4006	Customer plant	[50]	A	
K4007	Customer street	[50]	A	
K4008	Customer ZIP / City	[50]	A	
K4009	Customer country	[50]	A	
K4010	Manufacturer catalog	[80]	A	
K4012	Manufacturer number	[20]	A	
K4013	Manufacturer name 1	[80]	A	
K4014	Manufacturer name 2	[80]	A	
K4015	Manufacturer department	[50]	A	
K4016	Manufacturer plant	[50]	A	
K4017	Manufacturer street	[50]	A	
K4018	Manufacturer ZIP / City	[50]	A	
K4019	Manufacturer country	[50]	A	
K4020	Supplier catalog	[80]	A	
K4022	Supplier number	[20]	A	
K4023	Supplier name	[80]	A	
K4024	Supplier name 2	[80]	A	
K4025	Supplier department	[50]	A	
K4026	Supplier plant	[50]	A	
K4027	Supplier street	[50]	A	
K4028	Supplier ZIP / City	[50]	A	
K4029	Supplier country	[50]	A	
K4030	Purchase order catalog	[80]	A	
K4032	Purchase order number	[20]	A	
K4033	Purchase order name	[80]	A	
K4040	Material catalog	[80]	A	
K4042	Material number	[20]	A	
K4043	Material name	[80]	A	

Key	Field Name	Length	Type	Remarks
K4050	Drawing catalog	[80]	A	
K4052	Drawing number	[20]	A	
K4053	Drawing modification	[80]	A	
K4060	Machine catalog	[80]	A	
K4062	Machine number	[20]	A	
K4063	Machine name	[80]	A	
K4070	Gage catalog	[80]	A	
K4072	Gage number	[20]	A	
K4073	Gage name	[80]	A	
K4074	Gage group	[20]	A	
K4075	Gage – last calibration date		D	
K4076	Gage – next calibration date		D	
K4080	Units catalog	[80]	A	
K4082	Unit number	[20]	A	
K4083	Unit name	[80]	A	
K4090	Operator catalog	[80]	A	
K4092	Operator name 1	[20]	A	
K4093	Operator name 2	[80]	A	
K4094	Operator department	[50]	A	
K4095	Operator telephone number	[50]	A	
K4096	Operator fax number	[50]	A	
K4097	Operator e-mail address	[50]	A	
K4098	Operator position	[30]	A	
K4099	Operator title	[15]	A	
K4100	Contractor catalog	[80]	A	
K4102	Contractor number	[20]	A	
K4103	Contractor name	[80]	A	
4120	Employee (staff) catalog	[80]	A	
4122	Employee name 1	[20]	A	
4123	Employee name 2	[80]	A	
K4124	Employee department	[50]	A	
K4125	Employee telephone number	[50]	A	
K4126	Employee fax number	[50]	A	
K4127	Employee e-mail address	[50]	A	
K4128	Employee position	[30]	A	
K4129	Employee title	[15]	A	

Key	Field Name	Length	Type	Remarks
K4220	Event catalog (name of main-/ sub-catalog)	[80]	A	
K4221	Event catalog element (allocation event <-> sub-catalog)	[5]	I	
K4222	Event number	[20]	A	
K4223	Event text	[80]	A	
K4240	Process parameter catalog (name of main-/ sub-catalog)	[80]	A	
K4241	Catalog element (allocation process parameter <-> sub-catalog)	[5]	I	
K4242	Process parameter number	[20]	A	
K4243	Process parameter name	[80]	A	
K4244	Process parameter short text	[20]	A	
K4245	Process parameter value - number	[20]	A	
K4246	Process parameter value – Text	[80]	A	
K4249	Allocation Process parameter <-> Process parameter values	[5]	I	
K4250	Cavity catalog	[80]	A	
K4252	Cavity number	[20]	A	
K4253	Cavity name	[80]	A	

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