



# Datacolor QTX File Specification

## Overview

### What is QTX?

QTX is a proprietary format used for the exchange of color related information between Datacolor products. QTX is a plain-text, ASCII based format, composed of repeating blocks of standard and associated batch data sections. A typical file will describe the color of one or more standards and may optionally describe the color of several batches associated with each of those standards. The General layout looks like:

```
<Standard 1>
<Batch 1 of Standard 1>
<Batch 2 of Standard 1>
<Batch 3 of Standard 1>
...
...
<Batch N of Standard 1>
<Standard 2>
<Batch 1 of Standard 2>
<Batch 2 of Standard 2>
<Batch 3 of Standard 2>
...
...
<Batch M of Standard 2>
<Standard 3>
<Batch 1 of Standard 3>
<Batch 2 of Standard 3>
<Batch 3 of Standard 3>
...
...
<Batch P of Standard 3>
<Standard 4>
...
...
<Standard X>
<Batch 1 of Standard X>
<Batch 2 of Standard X>
<Batch 3 of Standard X>
...
...
<Batch Q of Standard X>
```

Where N, M, P and Q represent the final batches for their associated standards and X represents the final Standard in this file.

A qtx files may contain one or more standards, each of which may have zero or more associated batches. The fields that describe the standards and batches are largely freeform and, with the exception of a very few fields that are explicitly marked as mandatory in the next section, may be either included or omitted for any given sample.

The contents of the <Standard> and <Batch> blocks are explained in the next sections.

### Standards in a QTX file

Each Standard is represented in the QTX file by a standard-data section; each standard-data section is preceded by the line:

```
[STANDARD_DATA N]
```

Where N is a simple index number such as 0, 1, 2, 3, etc. e.g. [STANDARD\_DATA 0], [STANDARD\_DATA 1], [STANDARD\_DATA 2], etc.

The body of the standard data block consists of a sequence of Field-name, value pairs that take the general syntax:

```
FIELD_NAME=VALUE
```

One entry per line, where values are either: integer or floating point numbers, dates, strings or comma separated lists of these same types.

The body of each standard section must contain the following fields:

```
STD_NAME
STD_DATETIME
STD_REFLPOINTS
STD_REFLINTERVAL
STD_REFLOW
STD_R
```

The STD\_NAME field is used to associate the standard with any associated batches and it is therefore necessary for all standards to have unique names within a QTX file.

It is highly recommended to also include the fields:

```
STD_VIEWING
STD_INST_TYPE
STD_INSTRUMENT_SERIAL_NO
```

The standard data may optionally contain zero or more additional fields as described in the Standard Data section below.

The format of each of these fields is described in more detail in the Standard Data Section below.

### Batches in a QTX file

Any batches associated with the standards in a QTX file are represented in a batch-data section; each batch-data section is preceded by the line:

```
[BATCH_DATA N]
```

Where N is a simple index number such as 0, 1, 2, 3, etc. e.g. [BATCH\_DATA 0]. Batch indexes are usually reset to zero for each standard in the file, for example standard A might have three associated batches: [BATCH\_DATA 0], [BATCH\_DATA 1] and [BATCH\_DATA 2] and standard B might have four associated batches: [BATCH\_DATA 0] , [BATCH\_DATA 1] , [BATCH\_DATA 2] and [BATCH\_DATA 3]

The body of the batch data block consists of a sequence of Field-name, value pairs that take the general syntax:

```
FIELD_NAME=VALUE
```

One entry per line, where values are either: integer or floating point numbers, dates, strings or comma separated lists of these same types.

The body of each batch section must contain the following fields:

```
STD_NAME
BAT_NAME
BAT_DATETIME
BAT_REFLPOINTS
BAT_REFLINTERVAL
BAT_REFLFLOW
BAT_R
```

The STD\_NAME field is used to associate the batch with its associated standard and it is therefore necessary for all standards to have unique names within a QTX file. Batch names must be unique for all batches associated with a single standard, but batch names may be reused for batches associated with different standards.

It is highly recommended to also include the fields:

```
BAT_VIEWING
BAT_INST_TYPE
BAT_INSTRUMENT_SERIAL_NO
```

The batch data may optionally contain zero or more additional fields as described in the Batch Data section below.

The format of each of these fields is described in more detail in the Batch Data Section below.

## STANDARD\_DATA SECTION

The fields that follow in this section are all appropriate for use in the Standard Data section of the QTX file. In addition to the mandatory fields, some Datacolor products allow the users the ability to add user-defined data fields and this data is communicated alongside the Datacolor-defined fields in a QTX file. Datacolor products interpret and intelligently manage the fields that they recognize and they simply store, report and pass on the fields that they don't recognize. This is a list of the fields that are commonly used in the standard data section, this list also includes some of the common user-defined fields that we are aware of but is not exhaustive since users are adding new fields daily.

It is recommended that when encountering fields that are not defined as part of this core set, applications should simply

store the field name/data pairs as a single text attribute of the standard so that they can be simply written out again when forwarding the same sample by QTX file to another system. When writing the qtx file, the original position of these unrecognized fields can be ignored and they can be simply dumped to the end of the appropriate standard data block since the ordering of fields is not significant

## STANDARD\_DATA FIELD NAMES

### STD\_NAME

#### Description

*Name of the standard. In addition to naming the standard, this field is used to associate the standard with its associated batches and it is therefore necessary for all standards to have unique names within a QTX file.*

#### Type

*String*

#### Syntax

*STD\_NAME=Dark\_Red-2001-dcman-00659*

### STD\_DATETIME

#### Description

*General date time field*

*NOTE: The value indicates the number of seconds lapsed since January 1, 1970 12:00:00AM*

#### Type

*System DateTime Format*

#### Syntax

*STD\_DATETIME=1132337883,*

### STD\_REFLPOINTS

#### Description

*Number of reflectance or transmission points (number of entries in STD\_R)*

*Usual values include 16, 31, 35*

*NOTE: Some older products used the QTX format to communicate tristimulus data instead of spectral data. These products distinguished the two cases by setting this field to a value of -1. Although all known current products communicate reflectance data, the user should be aware of this legacy and software should test for the special case.*

#### Type

*Integer*

#### Syntax

*STD\_REFLPOINTS=35,*

### STD\_REFLINTERVAL

#### Description

*Wavelength gap, in nm, between adjacent wavelengths as reported in STD\_R*

*Usual values are 5, 10 and 20*

#### Type

*Integer*

#### Syntax

*STD\_REFLINTERVAL=10,*

**STD\_REFLOW****Description**

Starting wavelength used  
Usual values include 360, 380, 400

**Type**

Integer

**Syntax**

STD\_REFLOW=360,

**STD\_R****Description**

Reflectance/Transmission Data, usually %R or %T. The number of elements expected is defined by STD\_REFLPOINTS

**Type**

Comma separated sequence of Floating point

**Syntax**

STD\_R=92.456993,95.360001,97.522995,99.070999,100.132004,100.070000,100.035004,99.833000,100.114998,99.510994,99.403000,100.642990,99.105003,99.878998,100.005997,99.805000,99.587997,100.246002,98.991997,99.499001,101.813004,100.152992,98.885002,99.997002,100.857994,100.192001,100.037003,100.086998,100.108002,100.170990,100.714996,100.536003,99.985001,99.775002,101.012001

**STD\_VIEWING****Description**

Composite description of the conditions of the measuring instrument at the time of measurement.

**Contains:**

Measurement Type (%R, %T)  
Aperture (XLAV, LAV, MAV, SAV, USAV)  
Specular (SCI, SCE)  
Geometry (d/8, 0/45, 45/0)  
UV Content (UV Cal, UV Exc, UV Inc, UV 400, UV 420, UV 460)

**- Manual Entry**

Keyboard %R-# of reflectance points  
Keyboard %T-# of transmission points

**Type**

String

**Syntax**

STD\_VIEWING=%T MAV SCI d/8 UV Inc

**STD\_INST\_TYPE****Description**

How the color data was acquired.

**Possible values:**

Synthetic[comments]  
Keyboard[comments]  
Instrument name (ie.SF600)  
<Unknown>

**Type**

String

**Syntax**

STD\_INST\_TYPE=SpectraFlash SF600,

STD\_INST\_TYPE= Keyboard[by John],  
STD\_INST\_TYPE= Synthetic[from formulation],

**STD\_INSTRUMENT\_SERIAL\_NO****Description**

Serial number of the instrument that took the measurement

**Type**

String

**Syntax**

STD\_INSTRUMENT\_SERIAL\_NO=3230,

**STD\_GLOSS\_ADJ\_GEOMETRY****Description**

Gloss Angle (common values - 20, 60, 85)

**Type**

Integer

**Syntax**

STD\_GLOSS\_ADJ\_GEOMETRY=60

**STD\_GLOSS\_VALUE****Description**

Gloss Value returned from gloss meter or determined by a spectrophotometer

**Type**

Floating point

**Syntax**

STD\_GLOSS\_VALUE=57.6

**STD\_MEASDLL\_PARAMS****Description**

Comprehensive raw data string returned from the Datacolor instrument driver when taking a measurement. The content of this string varies depending on the type of measurement being made and may change over time as required by the instrument driver.

May be used if available but should not be artificially generated if missing.

**Type**

String

**Syntax**

Measurement dependent, best interpreted as a simple string.

**STD\_GUID****Description**

Unique Global Identifier for the sample

**Type**

GUID

**Syntax**

STD\_GUID=a5977ca9-26c2-4837-81f5-c5179d4af6aa

## BATCH\_DATA SECTION

The fields that follow in this section are all appropriate for use in the Batch Data section of the QTX file. In addition to the mandatory fields, some Datacolor products allow the users the ability to add user-defined data fields and this data is communicated alongside the Datacolor-defined fields in a QTX file. Datacolor products interpret and intelligently manage the fields that they recognize and they simply store, report and pass on the fields that they don't recognize. This is a list of the fields that are commonly used in the batch data section, this list also includes some of the common user-defined fields that we are aware of but is not exhaustive since users are adding new fields daily.

It is recommended that when encountering fields that are not defined as part of this core set, applications should simply store the field name/data pairs as a single text attribute of the standard so that they can be simply written out again when forwarding the same sample by QTX file to another system. When writing the qtx file, the original position of these unrecognized fields can be ignored and they can be simply dumped to the end of the appropriate standard data block since the ordering of fields is not significant

## BATCH\_DATA FIELD NAMES

### STD\_NAME

#### Description

Name of the standard. This is used to associate the batch with its associated standard and it is therefore necessary for all standards to have unique names within a QTX file.

#### Type

String

#### Syntax

STD\_NAME=Dark\_Red-2001-dcman-00659

### BAT\_NAME

#### Description

Batch names must be unique for all batches associated with a single standard, but batch names may be reused for batches associated with different standards.

#### Type

String

#### Syntax

BAT\_NAME=submit1

### BAT\_DATETIME

#### Description

General date time field

NOTE: The value indicates the number of seconds lapsed since January 1, 1970 12:00:00AM

#### Type

System DateTime Format

#### Syntax

BAT\_DATETIME=1132337883,

## BAT\_REFLPOINTS

#### Description

Number of reflectance or transmission points (number of entries in BAT\_R)

Usual values include 16, 31, 35

NOTE: Some older products used the QTX format to communicate tristimulus data instead of spectral data. These products distinguished the two cases by setting this field to a value of -1. Although all known current products communicate reflectance data, the user should be aware of this legacy and software should test for the special case.

#### Type

Integer

#### Syntax

BAT\_REFLPOINTS=35,

## BAT\_REFLINTERVAL

#### Description

Wavelength gap, in nm, between adjacent wavelengths as reported in BAT\_R

Usual values are 5, 10 and 20

#### Type

Integer

#### Syntax

BAT\_REFLINTERVAL=10,

## BAT\_REFLOW

#### Description

Starting wavelength used

Usual values include 360, 380, 400

#### Type

Integer

#### Syntax

BAT\_REFLOW=360,

## BAT\_R

#### Description

Reflectance/Transmission Data, usually %R or %T. The number of elements expected is defined by BAT\_REFLPOINTS

#### Type

Comma separated sequence of Floating point

#### Syntax

BAT\_R=92.456993,95.360001,97.522995,99.070999,100.132004,100.070000,100.035004,99.833000,100.114998,99.510994,99.403000,100.642990,99.105003,99.878998,100.005997,99.805000,99.587997,100.246002,98.991997,99.499001,101.813004,100.152992,98.885002,99.997002,100.857994,100.192001,100.037003,100.086998,100.108002,100.170990,100.714996,100.536003,99.985001,99.775002,101.012001

**BAT\_VIEWING****Description**

*Composite description of the conditions of the measuring instrument at the time of measurement.*

**Contains:**

*Measurement Type (%R, %T)*

*Aperture (XLAV, LAV, MAV, SAV, USAV)*

*Specular (SCI, SCE)*

*Geometry (d/8, 0/45, 45/0)*

*UV Content (UV Cal, UV Exc, UV Inc, UV 400, UV 420, UV 460)*

*- Manual Entry*

*Keyboard %R-# of reflectance points*

*Keyboard %T-# of transmission points*

**Type**

*String*

**Syntax**

*BAT\_VIEWING=%T MAV SCI d/8 UV Inc*

**BAT\_INST\_TYPE****Description**

*How the color data was acquired.*

*Possible values:*

*Synthetic[comments]*

*Keyboard[comments]*

*Instrument name (ie.SF600)*

*<Unknown>*

**Type**

*String*

**Syntax**

*BAT\_INST\_TYPE=SpectraFlash SF600,*

*BAT\_INST\_TYPE= Keyboard[by John],*

*BAT\_INST\_TYPE= Synthetic[from formulation],*

**BAT\_INSTRUMENT\_SERIAL\_NO****Description**

*Serial number of the instrument that took the measurement*

**Type**

*String*

**Syntax**

*BAT\_INSTRUMENT\_SERIAL\_NO=3230,*

**BAT\_GLOSS\_ADJ\_GEOMETRY****Description**

*Gloss Angle (common values - 20, 60, 85)*

**Type**

*Integer*

**Syntax**

*BAT\_GLOSS\_ADJ\_GEOMETRY=60*

**BAT\_GLOSS\_VALUE****Description**

*Gloss Value returned from gloss meter or determined by a spectrophotometer*

**Type**

*Floating point*

**Syntax**

*BAT\_GLOSS\_VALUE=57.6*

**BAT\_MEASDLL\_PARAMS****Description**

*Comprehensive raw data string returned from the Datacolor instrument driver when taking a measurement. The content of this string varies depending on the type of measurement being made and may change over time as required by the instrument driver.*

*May be used if available but should not be artificially generated if missing.*

**Type**

*String*

**Syntax**

*Measurement dependent, best interpreted as a simple string.*

**BAT\_GUID****Description**

*Unique Global Identifier for the sample*

**Type**

*GUID*

**Syntax**

*BAT\_GUID=a5977ca9-26c2-4837-81f5-c5179d4af6ab*

**Appendix 1 - Sample QTX File**

```
[STANDARD_DATA 0]
STD_NAME=Dark_Red-2001-dcman-00659
STD_DATETIME=928249765,
STD_REFLPOINTS=35,
STD_REFLINTERVAL=10,
STD_REFLFLOW=360,
STD_VIEWING=SAV SCI d/8 UV Inc,
STD_INST_TYPE=SpectraFlash SF600,
STD_INSTRUMENT_SERIAL_NO=3230,
STD_R= 3.194, 3.229, 2.827, 2.646, 2.555, 2.500, 2.484, 2.488, 2.496, 2.519, 2.538, 2.564, 2.604, 2.644, 2.675, 2.688,
2.695, 2.694, 2.715, 2.790, 2.910, 2.995, 3.026, 3.061, 3.165, 3.262, 3.185, 3.069, 3.145, 3.727, 5.563, 9.385, 15.855,
23.273, 31.220,
[BATCH_DATA 0]
STD_NAME=Dark_Red-2001-dcman-00659
BAT_DATETIME=928249715,
BAT_NAME=Red_submit_1
BAT_REFLPOINTS=35,
BAT_REFLINTERVAL=10,
BAT_REFLFLOW=360,
BAT_VIEWING=SAV SCI d/8 UV Inc,
BAT_INST_TYPE=SpectraFlash SF600,
BAT_INSTRUMENT_SERIAL_NO=5421,
BAT_R= 3.210, 3.161, 2.758, 2.589, 2.518, 2.452, 2.441, 2.433, 2.435, 2.456, 2.474, 2.507, 2.546, 2.584, 2.617, 2.628,
2.630, 2.637, 2.660, 2.727, 2.841, 2.921, 2.947, 2.973, 3.058, 3.141, 3.073, 2.964, 3.029, 3.560, 5.253, 8.813, 14.937,
22.063, 29.810,
[BATCH_DATA 1]
STD_NAME=Dark_Red-2001-dcman-00659
BAT_DATETIME=928599381,
BAT_NAME= Red_submit_2
BAT_REFLPOINTS=35,
BAT_REFLINTERVAL=10,
BAT_REFLFLOW=360,
BAT_VIEWING=SAV SCI d/8 UV Inc,
BAT_INST_TYPE=SpectraFlash SF600,
BAT_INSTRUMENT_SERIAL_NO=5421,
BAT_R= 35.667, 44.433, 52.253, 55.926, 58.162, 60.472, 62.245, 63.652, 64.614, 65.726, 67.179, 68.462, 69.915, 71.085,
72.375, 73.221, 73.944, 74.897, 75.625, 75.814, 75.891, 76.065, 76.380, 76.544, 76.851, 76.899, 76.635, 76.087, 76.244, 77.516,
80.012, 82.296, 84.080, 84.684, 85.111, [STANDARD_DATA 1]
STD_NAME=White-2001-dcman-00024
STD_DATETIME=928249765,
STD_REFLPOINTS=31,
STD_REFLINTERVAL=10,
STD_REFLFLOW=400,
STD_VIEWING=SAV SCI d/8 UV Inc,
STD_INST_TYPE=SpectraFlash SF600,
STD_INSTRUMENT_SERIAL_NO=3230,
STD_R=.270000,72.649994,86.519997,89.980003,90.889999,91.399994,91.639999,91.879997,92.059998,92.070000,92.199997,
92.379997,92.519997,92.629997,93.040001,93.430000,93.680000,93.750000,93.779999,93.750000,93.669998,93.680000,93.59
9998,93.430000,93.220001,93.169998,93.110001,93.080002,93.120003,93.139999,92.909996,
[BATCH_DATA 0]
STD_NAME= White-2001-dcman-00024
BAT_DATETIME=928249715,
BAT_NAME=White_submit_1
BAT_REFLPOINTS=31,
BAT_REFLINTERVAL=10,
BAT_REFLFLOW=400,
BAT_VIEWING=SAV SCI d/8 UV Inc,
BAT_INST_TYPE=SpectraFlash SF600,
BAT_INSTRUMENT_SERIAL_NO=2564,
```

BAT\_R=47.119999,68.300003,77.220001,78.639999,78.869995,78.959999,78.899994,78.750000,78.529999,78.150002,77.740005,77.400002,77.080002,76.810005,76.599998,76.380005,76.090004,75.760002,75.470001,75.199997,75.029999,74.970001,75.000000,75.089996,75.230003,75.389999,75.570000,75.849998,76.160004,76.440002,76.599998,  
 [BATCH\_DATA 1]  
 STD\_NAME= White-2001-dcman-00024  
 BAT\_DATETIME=928599381,  
 BAT\_NAME= White\_submit\_2  
 BAT\_REFLPOINTS=31,  
 BAT\_REFLINTERVAL=10,  
 BAT\_REFLFLOW=400,  
 BAT\_VIEWING=SAV SCI d/8 UV Inc,  
 BAT\_INST\_TYPE=SpectraFlash SF600,  
 BAT\_INSTRUMENT\_SERIAL\_NO=2564,  
 BAT\_R=48.090000,73.834999,87.947998,91.503998,92.215004,92.455002,92.826004,93.168999,93.407997,93.681000,93.893997,93.949005,94.011002,94.114998,94.059998,94.046005,94.065002,94.089005,94.095001,94.043999,93.958000,93.887001,93.857994,93.806000,93.574997,93.602997,93.403000,92.873001,93.220001,93.492004,93.480003,  
 [BATCH\_DATA 2]  
 STD\_NAME= White-2001-dcman-00024  
 BAT\_DATETIME=928599381,  
 BAT\_NAME= White\_submit\_3  
 BAT\_REFLPOINTS=31,  
 BAT\_REFLINTERVAL=10,  
 BAT\_REFLFLOW=400,  
 BAT\_VIEWING=SAV SCI d/8 UV Inc,  
 BAT\_INST\_TYPE=SpectraFlash SF600,  
 BAT\_INSTRUMENT\_SERIAL\_NO=2564,  
 BAT\_R=47.115002,72.131004,84.801003,87.500999,88.063995,88.412003,88.750000,88.927002,89.130997,89.356003,89.484001,89.633003,89.735001,89.834000,89.894005,90.021996,90.023003,90.065994,90.026001,89.991997,89.696999,89.484001,89.737999,89.738998,89.375000,89.401001,88.701996,86.170998,87.209000,89.183998,89.403000,

## Appendix 2 - Data Mapping for Viewing Condition String STD\_VIEWING / BAT\_VIEWING

### Description

Composite description of the conditions of the measuring instrument at the time of measurement.

Contains:

Measurement Type (%R, %T)

Aperture (XLAV, LAV, MAV, SAV, USAV)

Specular (SCI, SCE)

Geometry (d/8, 0/45, 45/0) -- Optional

UV Content (UV Cal, UV Exc, UV Inc, UV 400, UV 420, UV 460)

- Manual Entry

Keyboard %R-# of reflectance points

Keyboard %T-# of transmission points

Type

String

Syntax

STD\_VIEWING=%T MAV SCI d/8 UV Inc

Or BAT\_VIEWING=%T MAV SCI d/8 UV Inc

**Database Table - Data Mapping**

Name	Type	Column ID	Allows Nulls	Comment
Add Column				
MeasId	integer	1	No	Autoincrement
MeasurementType	char(1)	2	No	'R', 'T', 'C' for Reflectance/Transmission/Colorimetric
MeasurementSource	varchar(24)	3	No	'Instrument', 'Manual', 'Theoretical' ...
Specular	char(1)	4	Yes	'I', 'E'
MeasurementArea	varchar(8)	5	Yes	'LAV', 'USAV', etc
MeasurementSpot	float	6	Yes	Measured Spot in mm
UVContents	varchar(8)	7	Yes	'100%', 'calib', 'FL400', 'FL420', 'FL460'
CreationDate	datetime	8	No	
User_ID	varchar(24)	9	Yes	User login name. Intentionally not a foreign key to the User table.
Angle	float	10	Yes	Measurement angle in degrees (Multiangle instruments)
ReflectanceState	varchar(8)	11	Yes	'ROL', 'ROD', " for Reflectance over light, over dark, or opaque. NULL = unknown
ProcessLocation	varchar(24)	12	Yes	'Finished', 'Unfinished' etc. See table ProcessLocation (note: no foreign key)
UserComment	varchar(255)	13	Yes	Any Comment
MeasurementTag	varchar(32)	14	Yes	Any tag used for example in Center-Slide QC
CorrelationDataId	integer	15	Yes	If correlated, foreign key to correlation data

Database DSN "Dci\_itm" for Textile Setup, "CC2000\_DB" for Pigment setup

**Table <Measurement>:**

<u>Column</u>	<u>Possible Data Values [Column]</u>	<u>Build for XXX Viewing</u>
"MeasurementType"	R T	%R %T
"MeasurementSource"	Instrument  Manual	If it's "Instrument", continue to get data for Aperture, Specular, UV Content, Geometry(Optional); If it's "Manual", no need for Instrument related data, need to get data for number of curve points
"MeasurementArea"	XUSAV USAV SAV MAV LAV XLAV NORMAL	XUSAV USAV SAV MAV LAV XLAV NORMAL
"Specular"	I E	SCI SCE
"UVContents"	UVINC  UVEXC  None FL400 FL420 FL440 FL460 FL480 Calib  GG-D65 CIE-D65 CIE-C2 ISO BR-C	UV Inc ( possible old format: UV INC UVINC )  UV 400 (possible old format: UV EXC UVEXC UVExc UV Exc None )  None UV 400 UV 420 UV 440 UV 460 UV 480 UV Cal ( possible old format: Calib )  UV Cal UV Cal UV Cal UV Cal