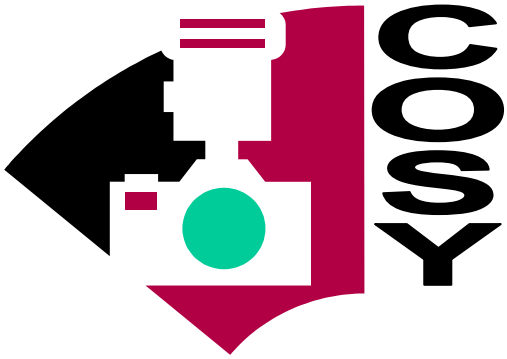
BMW Group



COSY Manual

Manual for BMW Colouring System (COSY) Version 2.4

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History

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0.1	14.01.2001	Klaus Gierner	Initial Preperation
0.2	19.01.2001	Klaus Gierner	Default of BKGND
0.3	03.05.2001	Klaus Gierner	Default-Color, alternative call thumbnails, produktive NT-Server, Removing SmallView (In Parameter WIDTH), Removing Value-area VIEW and BKGND
1.0	28.08.2001	Klaus Gierner	Additional Corner 180°, Additional Land Japan, Additional Picturesize for Mini
1.1	08.01.2002	Thomas Stehle	Format override, Parameter HEIGHT, Sports series extensions, thumbnail motorcycles, separation of widths by brand, default paint mini, LANGUAGE with international abbreviations
1.2	27.02.2002	Thomas Stehle	Static images (BKGND, SA, WIDTH, HEIGHT, VIEW). Views EXTERIOR and INTERIOR corrected to EXTERIEUR and INTERIEUR. Part 3 - Requesting different picture types – updated. Snapshot widths for Mini. New document title 'COSY Manual'
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	12.04.2002	Thomas Stehle	Description Static Images, VIEW=STATIC, Update 'Request of different picture types'
	17.06.2002	Thomas Stehle	Parameter RESP
	15.07.2002	Thomas Stehle	chapter 3.1.4 (static images): extended description for VIEW
	23.07.2002	Thomas Stehle	RESP description extended, chapter 3.1.2 error codes added
	11.09.2002	Thomas Stehle	Parameter CLIENT
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	17.10.2002	Thomas Stehle	Future Parameter ALIGN CLIENT description extended RESPONSE behaviour video
	24.02.2003	Thomas Stehle	CUT/ALIGN/X/Y/W/H added to COSY Parameters CLIENT=PBO UNIX Architecture Chapter 3 Cosy requests changed static paint and fabric images
Version	**Date**	**Author**	**Changes**

	08.05.2003	Thomas Stehle	QUALITY: Default changed from 50 to 80
	15.10.2003	Thomas Stehle	Added future COSY functionality chapter ' 4.2 COSY extensions for project UIC'
2.3	06.11.2003	Thomas Stehle	Manual version 2.2 -> 2.3 'COSY extensions for project UIC' added to chapter 2 Note: Chapter 3.2 was not updated
	10.11.2003	Thomas Stehle	Parameter USL: Example for BMW Bikes added.
	02.12.2003	Thomas Stehle	Parameter QUERY added
	25.03.2004	Thomas Stehle	Percentage Value for WIDTH and HEIGHT: behaviour description changed. Description of static images (chapter 3.17) updated.
	26.11.2004	Thomas Stehle	Parameter PRODDATE added, description of parameter DATE changed
	10.05.2004	Thomas Stehle	POV CENTERPANO added, Description for requesting panorama images chapter 3.2.10
	30.08.2005	Thomas Stehle	Value 'Extended Status' added for parameter RESP
	21.11.2005	Thomas Stehle	Parameter HFOV,PITCH,LAYER added Description for requesting an extracted panorama image added. Description for requesting a PNG-Layer added. Added Client ICS. Description of ANGLE updated. Further error values added (3.1.4). Chapter 3.1.10 Extracted panorama images. Chapter 3.1.11 Option layers…(PNG)
	24.01.2006	Thomas Stehle	Value 'Extended Status' corrected for parameter RESP Parameter LAYER extended, added 'base','paint','fabric'. Chapter 3.1.11 adapted to new LAYER behaviour.
	02.02.2006	Thomas Stehle	LAYER value 'bkgnd' new view 'WALKAROUND' and new static views for ICS (parameter VIEW) Chapter 3.2.12: Parameters for Walkaround
	24.03.2006	Thomas Stehle, Michael Pöttker	Documentation for UNIX Solaris Servers changed to documentation for Linux Servers. Cosy Build Version added.
	29.03.2006	Thomas Stehle	Document Version becomes Cosy Build Version
	01.09.2006	Thomas Stehle	Language 8 / EN = English

Version	**Date**	**Author**	**Changes**

	09.11.2007	Thomas Stehle	Version changed to 2.4 due to major internal software changes. Parameter RESP additional values. Parameter REFREQUEST introduced. Parameter ALIASED introduced. Parameter TOLERANCE introduced. Parameter QUERY additional values.
	10.12.2007	Matthias Stöcklein	Usage of CoSy for DFA
	31.01.2008	Thomas Stehle	Update of Cosy errors in chapter 3.1.4
	21.04.2008	Nina Meyer	Handling of DFA variants added
	14.05.2008	Nina Meyer	Coding of variants in chapter 2.24
	19.06.2008	Nina Meyer	Handling of DFA variants updated in chapter 2.24

Table of Contents:

1 General

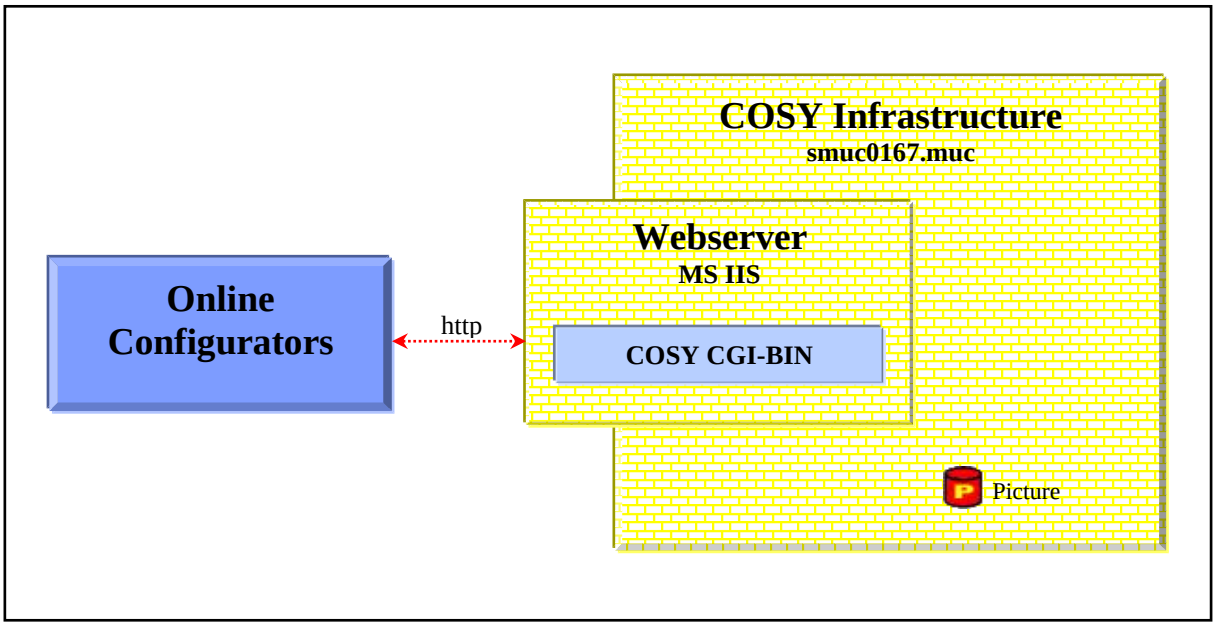
1.1 Starting Situation

The BMW Colouring System (COSY) is the 2D source for the online configurators within the BMW group. This includes eCOM, SA3, WATER and GAHP.

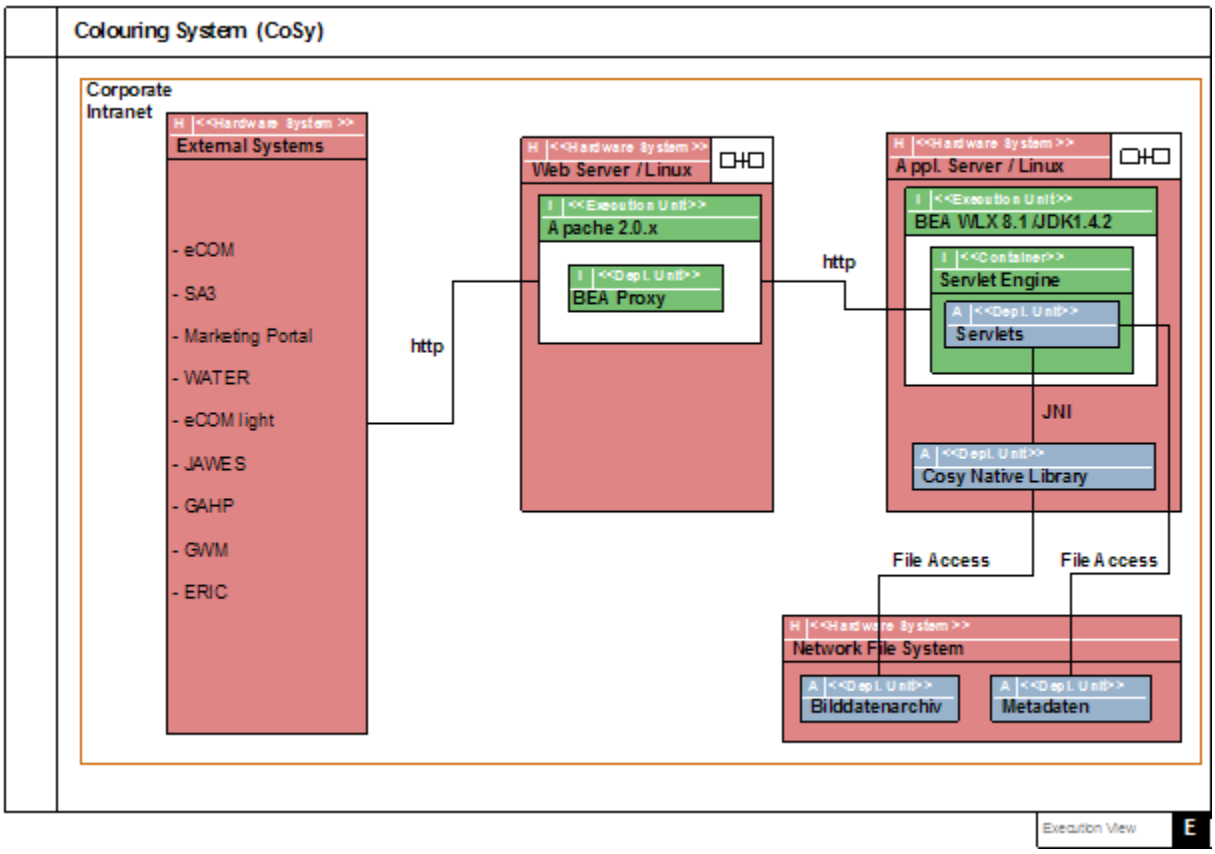
The aim of this manual is to give an overview about the functionality of COSY 2.0 and to provide an obligatory description for the implementation of online configurators.

1.2 Graphic survey NT (Context diagram)

Content of this interface-description is the matching unit between COSY and the consumer systems.



1.3 Graphic survey Linux (Context diagram)



2 Cosy parameters

In the following chapter all parameters available in COSY are listed and described in alphabetical order. The succeeding chapter (’’Call of different picture types“) describes which of these parameters are necessary respectively optional for obtaining a specific picture type.

If the value area is put in square brackets,e.g. [1, 2] or [A, B, C], exactly these values are valid. A quantity area ’’from until“ is marked with three dots (e.g. [1...100] means: all values from 1 to 100). Is the value area put into round brackets, it is not continuously enumerateable, but it has to fit pre-defined values. The parameter VEHICLE for example needs valid key codes. If there’s no default value for a parameter it is marked by a dash ’’-’’ .

2.1 Parameter ALIASED

ALIASED does only work with parameter LAYER or REFREQUEST. The difference between two images can be delivered as is or an anti-aliasing algorithm smoothens the edges of the returned image data.

Value-area	[0,1] 0: no anti-aliasing for difference images 1: anti-aliasing for difference images
Default	0

2.2 Parameter ALIGN

Alignment of the image within the given destination frame (WIDTHxHEIGHT).

Value-area	[LEFT, L, TOP, T, RIGHT, R, BOTTOM, B, CENTER, C] Multiple values can be combined separating them by commas (e.g. ALIGN=TOP,LEFT). Combinations TOP,BOTTOM and LEFT,RIGHT are are ignored. CENTER overrides any other alignment, e.g. LEFT is ignored if ALIGN=LEFT,CENTER is specified. LEFT and L mean the same, also TOP and T, and so on.
Default	ALIGN=CENTER

2.3 Parameter ANGLE

The parameter ANGLE controls the viewing angle of the exterior or interior view. COSY tries to generate a picture that fits best to the given value. The front view of the vehicle is defined as angle 0°. ANGLE can be used for exterior and interior dynamic images.

Important: ANGLE is superseded by POV, if POV is given.
Exception of this rule: Extracted panorama images, here ANGLE controls the rotation angle around y-axis, see chapter 3.1.10.

Value-area	[0 ... 359] Examples:

	45 = front-/side-view driver-side (VIEW=EXTERIEUR) 180 = cockpit-view (VIEW=EXTERIEUR, motorcycles) 180 = dashboard view (VIEW=INTERIEUR)
Default	ANGLE = 45

2.4 Parameter BKGND

The parameter BKGND controls whether the vehicles are shown with or without background. The result of photoshootings normally are pictures with background. In eCom it`s standard that BMW cars and motorcycles are shown in front of white background and MINI cars in front of black background. Pictures shooted with background are also shown with the original background.

Value-area	[0, 1 , 2] 0 = no background (white) 1 = original background (not defined for static images) 2 = no background (black) With COSY-Version 2.3 it is possible to define a background by a string: BLUEWHITE BLACKGRAY WHITE which equals BKGND=0 BLACK which equals BKGND=2
Default	BKGND = 0

2.5 Parameter BRAND

The parameter BRAND controls the selection of a specific brand. The value-area corresponds to the name-conventions of OKA/PCASO.

Value-area	[WBBM, WBABM, WBMI] WBBM = BMW cars WBABM = BMW motorcycles WBMI = Mini cars
Default	-

2.6 Parameter CLIENT

The parameter CLIENT was designed to separate directories with similar purpose but different requirements, e.g. different thumbnails for different client systems. CLIENT therefore controls for which client system (from what directory) a request has to be answered. Other parameters are not restricted by CLIENT. Caution: if a request can't be fulfilled, Cosy does not try to answer it by trying other client systems, there is no intelligence so far.

Value-area	[ECOM,SA3,ACC,PBO,…] ECOM and SA3: BMW Cars: base resolution 1000x600 (ICS: 1280x768) BMW Bikes: base res. 1000x600 MINI CARS: base res. 624x512 ACC: BMW Cars: base resolution 980x460 BMW Bikes: base res. 1000x600 MINI CARS: base res. 880x472 PBO: no base resolutions, static images only Base resolutions might change in the future, depending on the requirements of the data owners. Future clients will not necessarily be added to this list.
Default	ECOM

2.7 Parameter CUT

CUT controls how an image is fit into the destination frame. BKGND therefore has a new functionality although there is no new value. If BKGND is 1 (picture background) empty areas are filled with a pre-defined background image matching the image's background. Hint: only if CUT is 2 the image is stretched, otherwise the ratio of width and height is kept.

Value-area	[0,1,2] 0 = image is completely fit into the destinition frame. Empty areas are filled with BKGND. 1 = image is cut, so that any area of the destination frame is completely filled. 2 = image is stretched
Default	CUT = 0

2.8 Parameter DATE

The date when images are free for use in Cosy is stored in a vehicle's meta data. Sometimes a vehicle key does not change if there is a facelift of a car or bike. To request an image before such a facelift, the parameter DATE can be used. DATE is superseded by parameter PRODDATE which steers the production start date of a car or bike and therefore is more precisely.

Not providing a date, respectively the DATE or PRODDATE parameter, means, that COSY delivers pictures which fit to the **current date**.

Value-area	(Date) Date expression like this: YYYYMMDD, with Y=Year, M=Month, D=Day Missing day or month values are interpreted as „01“.
Default	current date, superseded by parameter PRODDATE

2.9 Parameter FABRIC

The parameter FABRIC controls the display of the corresponding upholstery in the interior and exterior picture based on the FABRIC-code of OKA/PCASO. The display of the upholstery in exterior pictures depends on the picture. This parameter is not relevant for motorcycles.

Value-area	(FABRIC-Code) Fabric-Codes consist of the code for an upholstery combination and a leading 'F'. For example 'FN6SW' is a valid code.
Default	-

2.10 Parameter H

Height of the desired source frame.

Value-area	[1..+19999]
Default	H = 10000

2.11 Parameter HEIGHT

The parameter HEIGHT controls the height of the returned picture. Normally pictures are calculated by width and ratio (10x6, respectively 10x8 for Mini Cars). Setting a HEIGHT parameter will perhaps distort the returned picture.

HEIGHT as percentage value:

For static images HEIGHT can be given as percentage value. Because the '%'-character is perhaps interpreted ambiguous in an URL also a 'p' can be specified. Example: HEIGHT=40% or HEIGHT=40p.

Value-area	[10 ... double max. base resolution height] Pixel [1% … 200%] Percentage (no decimals) [1p … 200p] Percentage (no decimals)
Default	-

2.12 Parameter HFOV

The parameter HFOV controls the horizontal field of view for an extracted panorama image. See Chapter 3.1.10 for further Details. An 'ordinary' value for HFOV is around 80 (which means you see 80 horizontal degrees of 360 degrees total).

Remark: The vertical field of view results from the given HFOV, WIDTH and HEIGHT parameters.

Value-area	[10 ... ca.120]
Default	-

2.13 Parameter LANG

The parameter LANG controls the language of error messages that are reported if a requested picture cannot be provided. An error message is realized as a picture. Further languages will be added in the future.
The language code can be set as number or as international abbreviation which is given in brackets.

Value-area	[1 ...8, (international codes)] 1 or DE = German 2 or GB = English 3 or FR = French 4 or IT = Italian 5 or ES = Spanish 6 or NL = Dutch 7 or JP = Japanese 8 or EN = English (in addition to '2 or GB')
Default	LANG = 1

2.14 Parameter LAYER

The parameter LAYER provides a special feature for dynamic images. LAYER is an extension of the SA parameter. The returned image only contains the image data which is affected by the option given in LAYER. Only one option code is allowed for parameter LAYER. Providing LAYER in SA-parameter list is optional and does not affect the output image.

See Chapter 3.1.11 for details.

Value-area	(LAYER) LAYER-Code can have the following values: 1. SA-Code (see parameter SA for syntax) 2. 'bgknd': background image 2. 'base': base image without e.g. background or seats 3. 'paint': peinture layer 4. 'fabric': trim layer including colour linked parts
Default	-

2.15 Parameter NAME

The parameter NAME controls selection of a static image by name. See further description in chapter 2.11 Parameter SA.

Value-area	[Name]
Default	-

2.16 Parameter PAINT

The parameter PAINT controls the display of the corresponding paint in the exterior and interior picture based on the PAINT-code in PCASO.
The paint cannot be displayed in some interior pictures.

Value-area	(PAINT-Code)	
Default	-	BMW Motorcycles
	PAINT = P0354	BMW Cars
	PAINT = P0900	Mini Cooper S
	PAINT = p0851	any other MINI Car

2.17 Parameter PITCH

The parameter PITCH controls the vertical angle for an extracted panorama image (horizontal angle is steered by parameter ANGLE). Value 0 (zero) is for center, positive values make the camera looking further down, negative values make the camera looking further up. See Chapter 3.1.10 for further Details.

Caution: Since panoramas in Cosy do not cover the complete 180° vertical view it is recommended to limit the value area.

Value-area	[-90 ...+90]
Default	0

2.18 Parameter POV (point of view)

By now the view of a dynamic image is steered by VIEW=EXTERIEUR or VIEW=INTERIEUR and an ANGLE. This results in a specific view of the car or bike displayed in the image which can be described by a point of view. For example VIEW=EXTERIEUR&ANGLE=0 means 'FRONT' as point of view, so the resulting image could also be requested with POV=FRONT. This behaviour is provided from now, additional to the existing VIEW/ANGLE-behaviour.

Any POV can be extended with values, e.g. to show a cabrio model with either open or close roof. Multiple values of POV have to be separated by commas, e.g. POV=FRONT,OPEN. Extension values are optional.

Value-area	(POV-Code) FRONT (EXTERIEUR 0) FRONTSIDE (EXTERIEUR 45/315) SIDE (EXTERIEUR 90/270) REARSIDE (EXTERIEUR 225/135) REAR (EXTERIEUR 180) DRIVERDOOR (INTERIEUR 0 ECOM) DASHBOARD (INTERIEUR 0 ACC) DRIVER (EXTERIEUR 180 (WBABM only)) REARBIRDSEYE (INTERIEUR 225) CENTERPANO (for centered panorama image) Extension values: OPEN CLOSE GRAYSHADED
Default	If no POV is given the view of the image is steered by VIEW and ANGLE. if POV is given, default extension value is OPEN.

Future requirements will need the definition of additonal POV's, especially for views which are not expressable by a combination of VIEW and ANGLE. An example, which is discussed, is the 'bird's eye view', a view of the car which shows exterior and interior as well. This exceeds the current behaviour.

2.19 Parameter PRODDATE

The parameter PRODDATE controls the selection of a vehicles production start date. This can be useful, if a vehicle's key code does not change when a facelift is introduced. Production start and end dates are stored in the meta data of vehicles scripts. PRODDATE supersedes parameter DATE (since PRODDATE is more precisely).

Not providing a date, respectively the PRODDATE or DATE parameter, means, that COSY delivers pictures which fit to the **current date**.

Value-area	(Production date) Date expression like this: YYYYMMDD, with Y=Year, M=Month, D=Day Missing day or month values are interpreted as „01“.
Default	current date. Parameter DATE, if given.

2.20 Parameter QUALITY

The parameter QUALITY controls the quality respectively the compression rate of the generated pictures.

Value-area	[0 ... 100] 0 = minimum Quality, maximum Compression 100 = maximum Quality, minimum Compression
Default	QUALITY = 80

2.21 Parameter QUERY

Value-area	[VERSION] VERSION = returns the current version of Cosy as a string (high version + low version + build number + _ + year + month + day = HHLLBB_YYMMDD) DATAPATH = returns the path where COSY data is installed on a server PINGFORSUCCESS = this requests always returns 'SUCCESS' in text/plain. This constant can be used as a trigger to check if a sever is still alive
Default	-

2.22 Parameter REFREQUEST

You can specify a reference request to a specific request. COSY performs a comparison between the image results of the two requests and returns a difference image. Please contact COSY support if you want to use this method since there are a lot of specifications which cannot be discussed here in full length.

2.23 Parameter RESP

The parameter RESP controls the way COSY behaves in different situations. RESP stands for 'response' or 'response type'. Thumbnails only support standard behaviour.

Value-area	[0..3] 0 = standard behaviour. If the request can be answered an image or video is responded, in case of an error a default image or default video is responded. Return type: 'image/jpeg' or 'video/quicktime'. 1 = status request. COSY returns '0' if the request is valid, otherwise an error code different to '0'. Return type: 'text/plain'. 2 = error description as image. If an error occurs an image containing an error description and an error code is returned. Otherwise the image is responded. Videos are treated as if RESP was 0. Return type: 'image/jpeg' or 'video/quicktime'. 3 = error code as text. If an error occurs an integer value (non-zero), represented as string, is returned. Otherwise, the image or video is returned. Return type: 'image/jpeg' or 'video/quicktime' if successful, 'text/plain' on error. 0..3 ORed with 8 (8..11) = extended status request. Verifies additional parameters like SA for dynamic built images.

Default	RESP = 0 respecitively RESP = jpeg,err_beauty (standard behaviour)

Since COSY supports PNG from version 2.4 it was needed to extend the behaviour of the parameter RESP. Picture format and error behaviour can be provided comma-separated. E.g. provide ' RESP=png,err_status ' to receive a PNG-image if no error occurs and the error code as text in case of an error.

Return type specification for parameter RESP

Value-area	jpeg : image request, return type image/jpeg png: image request, return type image/png status: status request, equals RESP=1, return type text/plain
Default	jpeg

Error handling specification for parameter RESP

Value-area	err_beauty = in case of an error a default image. Return type depends on return type specification err_image = in case of an error an image containing an error description and an error code is returned. Return type depends on return type specification err_status = in case of an error a non-zero integer value as text/plain is returned err_extended= in combination with return type 'status' additional parameters like SA for dynamic built images are verified.
Default	err_beauty

2.24 Parameter SA

This parameter controls either the display of SA's in connection with interior or exterior pictures (for example 'S0785' shows clear direction indicators if available) or the display of a static image of an SA. In case of interior and exterior pictures the parameter SA can be repeated ("…SA=xxx&SA=yyy…" or "…SA=xxx,yyy…"). COSY puts all available SA's into the corresponding picture. If an SA does not exist, COSY does ignore it but does not report an error, except for static images.

With introduction of client UIC a new problem had to be solved.
Problem: in configurators a dynamic image cannot be requested before the user selects PAINT or FABRIC. Solution: the image is displayed with a gray shade allover to avoid conflicts. This action is steered by a unique 'SA-Code-String', in this case 'GRAYSHADED'. Such strings have to be defined by the different clients. These SA-Code-Strings are valid only for VIEW=EXTERIEUR and VIEW=INTERIEUR.

CoSy can be used to show Dealer Fitted Accessories (DFAs) as well. Therefore, the parameter SA will be used by transferring either the DFA-code (SZ-code) and/or the part number. The DFA-code starts with Z0 and is followed by another three digits/letters. Examples are Z0ZFF, Z0ZJA, Z0Z3E and so on.

To make it possible to handle different variants of DFAs, the SA-Code of DFAs containing such variants will be expanded by "." followed by the ID of the variant.

Example:
....&SA=Z0Z01.5134&SA=Z0ZJA.523674

Value-area	(SA-Code) SA-Code can have the following formats: 1. three digit number for special equipment 2. S0 + three digit number for special equipment 3. Z0 + three digits/letters for a Dealer Fitted Accessory 4. T + part number, for equipment with no SA-Code 5. COSY internal defined strings (e.g. KEYxxx-Codes) 6. Z0 + three digits/letters for a Dealer Fitted Accessory + "." + ID of variant
Default	-

2.25 Parameter SHARP

The parameter SHARP controls the sharpness of an image returned by COSY. It is only evaluated for the views EXTERIEUR and INTERIEUR. Pictures are sharpened by default, but another value may improve the result. A negative value unsharpens the result.

Value-area	[-1000 .. 1000] note: values from –50 to 200 are recommended.
Default	-

2.26 Parameter TOLERANCE

TOLERANCE only works with parameters LAYER or REFREQUEST. The tolerance in brightness values (0..255) can be specified. Within this tolerance a pixel is determined as 'not different'. Note that 0 means, that the pixel must match exactly.

Value-area	[0..255]
Default	0

2.27 Parameter USL

Static images are stored in a tree-like way which depends on four parameters: BRAND (e.g. WBBM), ECODE (e.g. E46), BODY (e.g. sedan) and VEHICLE (e.g. AT11). The deeper an image is stored, the more detailed information is shown in the image. To define how far the content of the image may differ from the specified vehicle, the parameter USL (upper search limit) was introduced.
The search always starts at the VEHICLE and stops at the tree node corresponding to the USL value.

Value-area	[BRAND,ECODE,BODY,VEHICLE] Example: if the requested image has to show at least an BMW E46 Compact 'USL=BODY' has to be given. Search starts at VEHICLE (e.g.AT11) and ends for this example at COMPACT.
Default	VEHICLE

Notice: the tree is stored COSY-internal, the caller does'nt have to know about the exact terms.

An example for the tree (WBBM):

```
BRAND    ECODE       BODY        VEHICLE

WBBM-------
             E46-------------
                         COMPACT----
                                     316ti AT11
                                     318ti AU51
                         SEDAN---------
             E53--------------
             …
             …
```

2.28 Parameter VEHICLE

The parameter VEHICLE controls the display of the corresponding vehicle according to the key code from OKA/PCASO.

Value-area	(Key code) Hint: BMW Cars type keys with the extensions [m,n,o,p,q ,r] are interpreted by COSY as M-sports-series. (currently only used in Japan)
Default	-

2.29 Parameter VIEW

The parameter VIEW controls the selection of the desired view.

Important: VIEW is superseded by POV, if POV is given.

Value-area	(View) EXTERIEUR: exterior view INTERIEUR: interior view WALKAROUND: 360° views exterieur THUMBNAIL: thumbnail THUMBNAIL_SELECTED: pushed thumbnail (Mini only) STATIC: static images VIDEO: videos, e.g. Quicktime (future value, see 4.1)
Default	-

VIEW for consumers which use Client ECOM:

Some consumers use CLIENT=ECOM, because their contents differ little from this client. The difference are the static images or thumbnails. Therefore these views are currently available for requesting additional types of static images:

Thumbnail for interior color UIC:	VIEW=UIC_FABRIC_DETAIL
Thumbnail for wheels UIC:	VIEW=UIC_WHEELGRAY
Thumbnail for interior color ICS:	VIEW=ICS_FABRIC_DETAIL
Thumbnail for wheels ICS:	VIEW=ICS_WHEELGRAY
Mood image for Bikes	VIEW=UIC_MOOD_ (Language Code)

Search pattern for static images:

The special behaviour of thumbnails for bikes, that, if PAINT and SA is given, the name of the image is created to PAINT_SA (in the following it is called the search pattern), is taken over to any request of a static image.

So the following constellations are possible:

PAINT / FABRIC	**SA / NAME**	**Search pattern (COSY internal)**	**Example for search pattern**
PAINT	SA	PAINT_SA	P0789_S0776
FABRIC	SA	FABRIC_SA	FN6SW_T6543298
PAINT	NAME	PAINT_NAME	P0354_MOOD
FABRIC	NAME	FABRIC_NAME	FH9AT_MOOD
PAINT	SA,SA,…	PAINT_SA_SA_…	P0564_S0345_S0765_…
FABRIC	SA,SA,…	FABRIC_SA_SA_…	FH7SN_S0675_S0349
	SA	SA	S0765 or T6545838
	NAME	NAME	DIMENSIONS

2.30 Parameter W

Width of the desired source frame.

Value-area	[1..+19999]
Default	W = 10000

2.31 Parameter WIDTH

The parameter WIDTH controls the resolution (width x height) of the displayed picture. COSY tries to generate the picture from the existing base-resolutions. If the desired resolution does not exist, the picture is zoomed down from the next higher available resolution. The following base resolutions are availabe:

BMW Cars, BMW Bikes (aspect ratio 10 x 6)

1.	1000x600	WIDTH=1000	Original size
2.	324x194	WIDTH=324	eCom BigView
3.	160x96	WIDTH=160	eCom MiddleView

Mini Cars (aspect ratio ca. 10 x 8)

1.	624x512	WIDTH=624	Original size
2.	312x256	WIDTH=312	eCom BigView Mini
3.	156x128	WIDTH=156	eCom Middle View Mini
4.	484x397	WIDTH=484	Snapshot Big
5.	178x146	WIDTH=178	Snapshot Small

Static Images:

The WIDTH parameter for static images is interpreted different from standard calls. Static images usually do not fit into a predefined size. So the images are put into a frame defined by WIDTH and HEIGHT, but they are not distorted. If no HEIGHT is given, HEIGHT is counted by standard aspect ratio depending on the brand (10x6, respectively 10x8). Non covered areas are filled with the BKGND color.

WIDTH as percentage value:

For static images WIDTH can be given as percentage value. Because the '%'-character is perhaps interpreted ambiguous in an URL also a 'p' can be specified. Example: WIDTH=40% or WIDTH=40p.

Value-area	[10 ... double max. base resolution width] Pixel [1% … 200%] Percentage (no decimals) [1p … 200p] Percentage (no decimals)
Default	WIDTH = 1000 (Pixel)

2.32 Parameter X

Left position of the desired source frame.

Value-area	[-9999…+9999]
Default	X = 0

2.33 Parameter Y

Top position of the desired source frame.

Value-area	[-9999…+9999]
Default	Y = 0

3 Requesting different picture types

3.1 General hints

Currently the COSY interface supports the following picture types (scheme describes CLIENT=ECOM, other clients may have less picture types):

	BMW Cars	Mini Cars	BMW Motorcycles
Exterior view	✓	✓	✓ [1]
Interior view	✓	✓	
Static SA pictures	✓	✓	✓
Static paint pictures	✓	✓	
Static fabric pictures	✓	✓	
Static pictures by name	✓	✓	✓
Video view	✓	✓	✓
Thumbnail fabric	✓	✓	
Thumbnail paint	✓	✓	✓

The request for a picture from COSY is done by giving an URL, what is similar to the request for an internet page. The protocol used is HTTP. COSY currently runs both on a Windows and a Linux Server cluster.

3.1.1 URL for Windows Servers

Any request for a picture from a Windows Server fits the following specification:

http://<server:port>/<path>/cosy.cgi/get?<parameter>

In order to be very flexible it should be possible to change <server>- and <path>-statements by parameter settings.

[1] Motorcycle views are not separated into exterior and interior. It is specified here just because of clearness.

3.1.2 URL for the Linux Server

Any request for a picture from the Linux Server fits the following specification:

http://<server:port>/cosy?<parameter>

For the current Linux installation of COSY the first part of the link looks like this:

http://liintra:5194/cosy?<parameter>

In order to be very flexible it should be possible to change <server>- and <path>-statements by parameter settings.

3.1.3 Some words for the syntax

- ''Can''-parameters are written in small letters (e.g. ''date''), ''Must''-parameters are written in big letters (e.g. ''VEHICLE''). Repeatable parameters are set into square brackets following a multiplication sign (e.g. [sa=<SA-Code>&]*).
- The sequence of the parameters is interchangeable.
- The parameters are attached to the URL by an "&"-sign.
- Different SA values can be linked by commas.
  Example: ...SA=735,321,T7664553...

3.1.4 Error characteristics

- ''Must-parameters'' which exceed the value area non-available pictures cause an error message.
- If a request cannot be fulfilled COSY will return a picture containing an error message.
- ''Can-parameters'' are ignored if they would cause an error message.
- Parameters with no function (e.g. ANGLE for a thumbnail) are ignored.

Here are some important error codes generated by COSY, if non-standard behaviour (Parameter RESP <> 0) is chosen:

1000x – Data Structure memory allocation errors
10050 - Directory in Cosy data structure missing
101xx - Vehicle definitions unreadable
10230 - Request: directory to requested VIEW not found
10240 - Request: base resolution not found
10250 - Request: requested VIEW not defined for VEHICLE
10260 - Request: requested PAINT not available
10270 - Request: requested FABRIC not available
10290 - Request: requested SA not available (for future versions)
10291 - Request: requested NOT not available
10500 - Request: BRAND not defined
10510 - Request: VIEW not defined
10520 - Request: PAINT not defined
10525 - Request: SA needed, but not defined
10526 - Request: NAME needed, but not defined
10527 - Request: NAME and SA defined, not allowed
10530 - Request: FABRIC not defined
10540 - Request: VEHICLE not defined
10550 - Request: DATE out of range
10551 - Request: ANGLE out of range
10552 - Request: QUALITY out of range
10553 - Request: WIDTH out of range
10554 - Request: DATE syntax invalid
10555 - HFOV or PITCH out of range, or mismatch with WIDTH/HEIGHT
10610 - Image not found
10640 - VEHICLE-Definition not found
10710 - Error loading a file
10730 - Error creating a jpeg image
10740 - Error in extracting a panorama
10750 - Error creating a layered image (LAYER)
10760 – Memory allocation error
10810 - Static Image not found
10820 - Video not found

3.1.5 Positioning, cutting, fitting and aligning images

Images can be posittioned, cut, fit and aligned. Therefore parameters X,Y,W,H, CUT and ALIGN were introduced. X and Y set the top-left position of the image clipping frame, W and H the size.

The values of parameters X,Y,W,H are virtual, i.e. they do not represent the real pixel positions in the original image. Instead the width and height of the original image is translated to 10000x10000 units.
Example: an image's width is 500 pixels. You only want see a clip of 300 pixels width. So you have to set W to (300/500) x 10000 = 6000 units. Advantage of this method: if the original image size is 250 and you want to see the image in the same ration you also have to set W = 6000 units. That means you don't have to know about the original size, you just define the ratio in values of 10000.

If Parameter CUT is set to 0 and the image does not fill the frame, the image can be aligned within the frame. Therefore the parameter ALIGN is introduced. If you,for example, want to place the image at the top-left edge of the frame, you set ALIGN=TOP,LEFT resp. ALIGN=T,L.

3.1.6 Static Images

Static images are images which are stored local on the image server. There are different kinds of static images. There are images for e.g. details of a wheel, mood images, paint images or fabric images. Static images are always BRAND- and sometimes VEHICLE-dependent.

Vehicle:

If a static image is called with VEHICLE parameter, COSY uses link tables to find the static image for the specific vehicle.
If a static image is called without VEHICLE parameter, COSY tries to open a vehicle-independent image, only specific for the brand.

View:

The VIEW for a static image reqresents the directory a static image is stored in. Some directories are: static, thumbnail, uic_wheelgray. If no VIEW is given COSY maps the VIEW to STATIC (this supports a behaviour introduced in the past).

Parameters:

Static images are provided for parameters PAINT, FABRIC, SA and NAME.

If not exactly one parameter of the above is given the parameters are combined in the following order: (PAINT or FABRIC)_(SA)_(NAME). VIEW. If multiple SA parameters are given, they are put in the requested order (..SA=SA1,SA2,SA3.. becomes SA1_SA2_SA3).

See paramter VIEW (chapter 2.22) for extended description of parameter combination.

Size of the returned image:

There are three ways of steering the size of the returned image:

- No WIDTH or HEIGHT is given, respectivley both are zero: the image is returned as is.
- WIDTH or HEIGHT is given: the image is stretched proportional to the given parameter. Example:original size is 324x194. If the WIDTH value is 648 the size of the returned image 648x384.
- WIDTH and HEIGHT is given: the image is fit into the given rectangle without being distorted. If it does not fit exactly empty areas are filled with the background color given in parameter BKGND.
- Parameters X,Y,W,H,CUT,ALIGN are also provided for static images. See chapter 3.1.5 for documentation.

3.1.7 Videos

Videos show animations of, for example, wheels as Quicktime Videos. Videos are displayed as is. That means, there is neither control of WIDTH and HEIGHT nor control of the background color BKGND. Also the QUALITY cannot be changed. If a requested video cannot be found a specific error video is returned

3.1.8 BMW Motorcycles special behaviour

The following special features have to be considered for motorcycle pictures:

- The paint code always contains the color of the series seat. Possible extra seat colors are chosen by their according SA-code.
- Currently no fabric thumbnails are provided. Therefore there’s no need of a corresponding picture type.

Motorcycle thumbnails need the parameter VEHICLE, because there are overlappings between different thumbnails.

3.1.9 Extracted panorama images

Background: Requesting an image with POV=CENTERPANO results in a 360° centered panorama image. For threedimensional moving within the panorama a special panorama viewer is needed.

In the meantime it is possible to let Cosy extract a specific view out of the panorama. This feature is not intended to replace panorama viewers, but to let customers create kind of a interior turn around with, for example, one image every 45 degrees.

These are the requirements for a Cosy-request for an extracted panorama:

- POV=CENTERPANO
- parameter HFOV has to be specified
- parameters ANGLE and PITCH steer the camera direction, optional
- WIDTH and HEIGHT have to be specified since there is no base resolution or width-height-ratio defined for extracted panoramas.
- HFOV, PITCH and YAW have to be integer values. Floating point values are not supported

Remarks:

- The base panorama image for an extracted panorama is assembled in highest resolution, and therefore WIDTH and HEIGHT steer the size of the extracted image.
- because centered panoramas do not cover the complete 180 degrees of pitch (-90°..+90°), it is possible, that an extracted panorama image contains 'black' (non-image) areas. It is recommended to evaluate suitable values for HFOV, WIDTH, HEIGHT and PITCH. The greater WIDTH in comparison to HEIGHT is chosen, the smaller the chance of having 'black' areas.

3.1.10 Option layers as PNG with alpha channel

Some clients need to have exposed image data of dynamically assembled images. The desired exposure has to be provided in parameter LAYER. Exposures are available for options, peintures, trims and base images (where background is left out). This new functionality works with any request that results in a dynamically produced image (exterior views, interior views, panoramas, extracted panoramas) .

The resulting picture format is PNG with alpha channel, where an alpha of 0 means fully transparent and an alpha of 255 means fully opaque.

3.2 Picture type URLs

3.2.1 Exterior view

The URL for the exterior view contains the following can- and must- parameters:

```
BRAND=<brand code>&
VEHICLE=<vehicle-key>&
PAINT=<paint code>&
fabric=<fabric code>& *
VIEW=EXTERIEUR
lang=<language code>&
bkgnd=<background code>&
angle=<angle exterior view>&
quality=<compression rate>&
width=<horizontal resolution>&
[sa=<SA-code or part number>&]
date=<date of production>&
sharp=<sharpness>&
resp=<resp code>&
client=<client>&
cut=<cut value>&
align=<align value>&
x=<x value>&
y=<y value>&
w=<w value>&
h=<h value>&
```

* not for BMW Bikes (BRAND=WBABM)

3.2.2 Interior view

The URL for the interior view contains the following can- and must- parameters:

```
BRAND=<brand code>&
VEHICLE=<vehicle key>&
paint=<paint-code>&
FABRIC=<fabric-code>&
VIEW=INTERIEUR
lang=<language-code>&
bkgnd=<background-code>&
angle=<angle exterior view>&
quality=<compression rate>&
width=<horizontal resolution>&
[sa=<SA-code or part number>&] *
date=<date of production>&
sharp=<sharpness>&
resp=<resp code>&
client=<client>
cut=<cut value>
align=<align value>
x=<x value>
y=<y value>
w=<w value>
h=<h value>
```

Hint: BMW Bikes (BRAND=WBABM) do not have an interior view.

3.2.3 Static SA-Pictures

The URL for static SA-pictures contains the following can- and must-parameters:

```
BRAND=<brand code>&

vehicle=<vehicle key>&

SA=<SA-code or part number>&

VIEW=STATIC&

width=<width>&

height=<height>&

lang=<language-code>&

quality=<compression-rate>&

bkgnd=<background-code>&

sharp=<sharpness>&

resp=<resp code>&

client=<client>&

cut=<cut value>&

align=<align value>&

x=<x value>&

y=<y value>&

w=<w value>&

h=<h value>
```

3.2.4 Static paint images

The URL for static paint images contains the following can- and must-parameters.

```
BRAND=<brand code>&

PAINT=<paint code>&

VIEW=STATIC&

width=<width>&

height=<height>&

lang=<language-code>&

quality=<compression-rate>&

bkgnd=<background-code>&

sharp=<sharpness>&

resp=<resp code>&

client=<client>&

cut=<cut value>&

align=<align value>&

x=<x value>&

y=<y value>&

w=<w value>&

h=<h value>
```

Static paint images are currently only supported for CLIENT=PBO.

3.2.5 Static fabric images

The URL for static fabric images contains the following can- and must-parameters.

```
BRAND=<brand code>&

FABRIC=<fabric code>&

VIEW=STATIC&

width=<width>&

height=<height>&

lang=<language-code>&

quality=<compression-rate>&

bkgnd=<background-code>&

sharp=<sharpness>&

resp=<resp code>&

client=<client>&

cut=<cut value>&

align=<align value>&

x=<x value>&

y=<y value>&

w=<w value>&

h=<h value>
```

Static fabric images are currently only supported for CLIENT=PBO.

3.2.6 Static Pictures by Name

The URL for static pictures by filename contains the following can- and must-parameters:

```
BRAND=<brand code>&

vehicle=<vehicle key>&

NAME=<name>&

VIEW=STATIC&

width=<width>&

height=<height>&

lang=<language-code>&

quality=<compression-rate>&

bkgnd=<background-code>&

sharp=<sharpness>&

resp=<resp code>&

client=<client>&

cut=<cut value>&

align=<align value>&

x=<x value>&

y=<y value>&

w=<w value>&

h=<h value>
```

3.2.7 Videos

The URL for videos for a BMW car contains the following can- and must-parameters:

```
BRAND=<brand code>&

VIEW=VIDEO&

vehicle=<vehicle key>&

SA=<sa-code or part number>& or NAME=<name>&

lang=<language-code>&

resp=<resp code>&

client=<client>
```

3.2.8 Thumbnails for Paint

The URL for paint thumbnails contains the following can- and must- parameters:

```
BRAND=<brand code>&

VEHICLE=<vehicle code>& *

PAINT=<color-code>&

VIEW=THUMBNAIL& or VIEW=THUMBNAIL_SELECTED **

width=<width>&

height=<height>&

sa=<sa-code for seat>& *

sharp=<sharpness>&

resp=<resp code>&

client=<client>&

cut=<cut value>&

align=<align value>&

x=<x value>&

y=<y value>&

w=<w value>&

h=<h value>
```

* BMW Bikes (BRAND=WBABM) only

** VIEW=THUMBNAIL_SELECTED is for MINI Cars (BRAND=WBMI) only

3.2.9 Thumbnails for Fabric

The URL for the fabric thumbnails contains the following can- and must-parameters:

```
BRAND=<brand code>&

FABRIC=<fabric code>&

VIEW=THUMBNAIL& or VIEW=THUMBNAIL_SELECTED& *

width=<width>&

height=<height>&

sharp=<sharpness>&

resp=<resp code>&

client=<client>&

cut=<cut value>&

align=<align value>&

x=<x value>&

y=<y value>&

w=<w value>&

h=<h value>
```

For BMW Bikes (BRAND=WBABM) there are no trim thumbnails.

* VIEW=THUMBNAIL_SELECTED is for MINI Cars (BRAND=WBMI) only.

3.2.10 Panorama images

Panorama images are handled like interior views as described in chapter 3.2.2, except that therefore no VIEW or ANGLE is to be specified. Instead POV=CENTERPANO is needed. Since there is no reference size for panoramas, it is recommended to set WIDTH and HEIGHT to zero.

```
BRAND=<brand code>&

VEHICLE=<vehicle key>&

paint=<paint-code>&

FABRIC=<fabric-code>&

POV=CENTERPANO

lang=<language-code>&

quality=<compression rate>&

width=<width>&

height=<height>&

[sa=<SA-code or part number>&]

date=<date of production>&

sharp=<sharpness>&

resp=<resp code>&

client=<client>
```

3.2.11 Extracted panorama images

Extracted panorama images are a special case of panorama images where a view is extracted from a panorama and is projected to two-dimensional space.

```
BRAND=<brand code>&

VEHICLE=<vehicle key>&

paint=<paint-code>&

FABRIC=<fabric-code>&

POV=CENTERPANO

lang=<language-code>&

quality=<compression rate>&

WIDTH=<width>&

HEIGHT=<height>&

[sa=<SA-code or part number>&]

date=<date of production>&

sharp=<sharpness>&

resp=<resp code>&

client=<client>

HFOV=<horizontal field of view>

angle=<rotation angle y-axis>

pitch=<rotation angle x-axis>
```

3.2.12 Walkaround

The URL for the Walkaround view contains the following can- and must-parameters:

```
BRAND=<brand code>&

VEHICLE=<vehicle-key>&

PAINT=<paint code>&

fabric=<fabric code>&

VIEW=WALKAROUND

lang=<language code>&

bkgnd=<background code>&

angle=<angle exterior view>&

quality=<compression rate>&

width=<horizontal resolution>&

[sa=<SA-code or part number>&]

date=<date of production>&

sharp=<sharpness>&

resp=<resp code>&

client=<client>&

cut=<cut value>&

align=<align value>&

x=<x value>&

y=<y value>&

w=<w value>&

h=<h value>&

layer=<layer value>&
```

4 Future COSY functionalities

4.1 Movies

Movies, such as Quicktime videos, will be provided by COSY in the future. Therefore a new value for parameter VIEW is being introduced. See Description for PARAMETER VIEW in chapter ‘2 COSY Parameters’. The way to request movies is described in chapter ‘3 Requesting different picture types’.