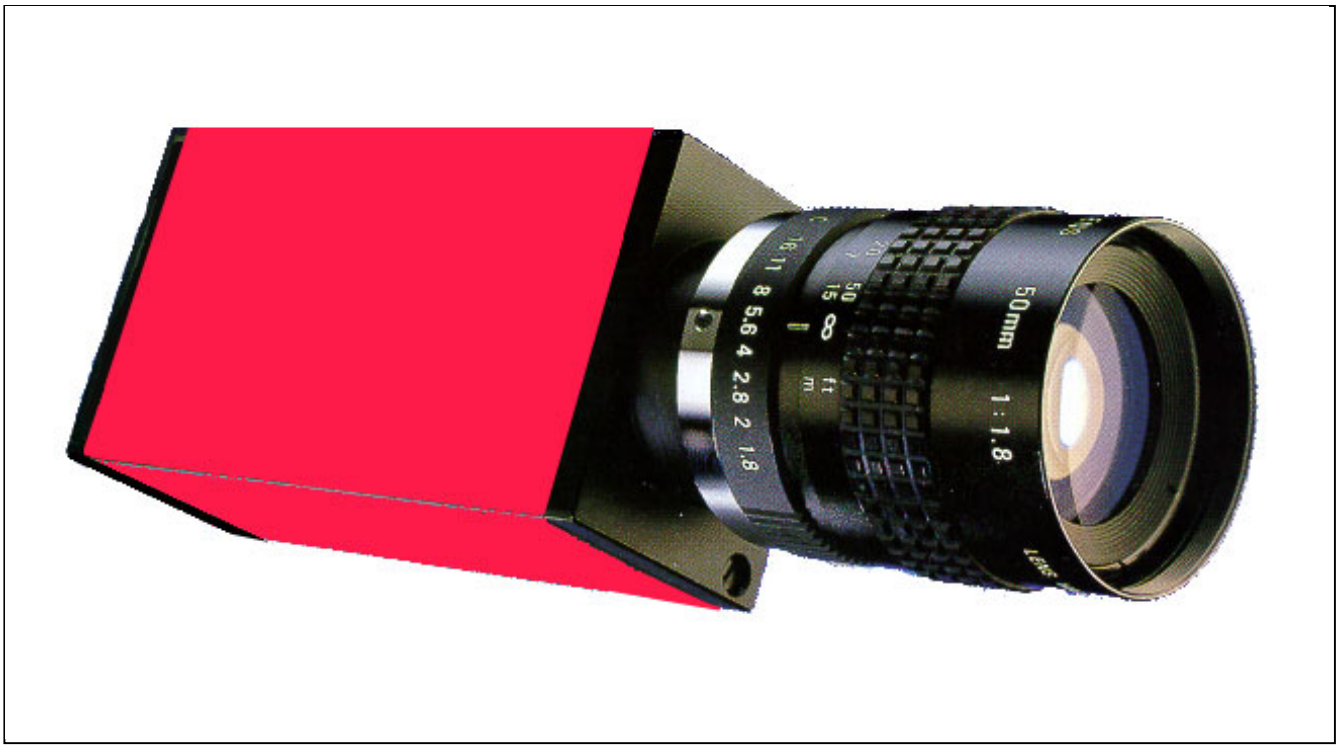
Smartcamera *redCAM*

Serial Commands



Note

We have tried to offer this ***redCAM*** manual to our customers free of errors and easy to understand. However, any information for improving this manual or for the elimination of errors are welcome.

We can not assume responsibility for any error in this manual, or for any operating error which may result from such errors.

Thank you for your understanding.

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"CSEL"	Select Blob Calibration Parameter
"CCHG"	Change Blob Calibration Parameter

Blob Ablauf

"FRUN"	Run a Blob Ablauf
"FNUM"	Return from "FRUN"
"FRES"	Return from "FRUN"
"FIRF"	Init Blob Ablauf Reference
"FRRF"	Init Blob Ablauf Reference
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Barcode

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"RSEL"	Select Barcode Parameter
"RCHG"	Change Barcode Parameter

Reference

"RSEL"	not used
"RCHG"	not used
"RRUN"	not used
"RINI"	not used

Messtechnik Merkmal

"MRUN"	Run a Merkmal
"MRES"	Return for "MRUN"
"MINI"	Init a Merkmal Position
"MSEL"	Select Merkmal Parameter
"MCHG"	Change Merkmal Parameter

Messtechnik Ablauf

"ARUN"	Run an Ablauf
"ANUM"	Return for "ARUN"
"ARES"	Return for "ARUN"
"AINI"	Init Ablauf Tolerance
"ASEL"	Select Ablauf Parameter
"ACHG"	Change Ablauf Parameter
"TCHG"	Change Ablauf Tolerance

Messtechnik Calibration

"KRUN"	Run Calibration
"KRES"	???
"KSEL"	Select Calibration Parameter
"KCHG"	Change Calibration Parameter

2 Parameters of serial commands

2.1 Command:EERR

Command:	"EERR"
Return:	"EERR"
Command Parameter:	None
Return Parameter:	None
Function:	Error.
Mode:	A/M
Tools:	All

2.2 Command:CSNP

Command:	"CSNP"
Return:	"CSNP"
Command Parameter:	None
Return Parameter:	None
Function:	Camera Snap Mode. (Bildaufnahme)
Mode:	A/M
Tools:	All

2.3 Command:CLIV

Command:	"CLIV"
Return:	"CLIV"
Command Parameter:	None
Return Parameter:	None
Function:	Camera Livemode.
Mode:	A/M
Tools:	All

2.4 Command:SAVE

Command:	"SAVE"
Return:	"SAVE"
Command Parameter:	None
Return Parameter:	None
Function:	Save all current data to EEPROM sector 7. (except models!)
Mode:	A/M
Tools:	All

2.5 Command:LOAD

Command:	"LOAD"
Return:	"LOAD"
Command Parameter:	None
Return Parameter:	None
Function:	Load all data from EEPROM.
Mode:	A/M
Tools:	All

2.6 Command:TOOL

Command:	"TOOL"
Return:	"TOOL -Tn -Vn -D<s>"
Command Parameter:	None
Return Parameter:	None
Return Parameter:	T -> (unsigned) Current Tools:

Windows:	n |= 0x01
Blob:	n |= 0x02
Messtechnik (MT):	n |= 0x04
Merkmal (MT):	n |= 0x08
Ablauf (MT):	n |= 0x10
Histogramm:	n |= 0x20
Ser. Com.:	n |= 0x40
BCR:	n |= 0x80

V -> (unsigned) Version
Version 1.03 == 103
D -> (char *) Data Filename.

Function:	Returns the status of the software and data.
Mode:	A/M
Tools:	All

2.7 Command:MENU

Command:	"MENU"
Return:	"MENU"
Command Parameter:	None
Return Parameter	None
Function:	Starts menu mode.
Mode:	A/M
Tools:	All

2.8 Command:AUTO

Command:	"AUTO"
Return:	"AUTO"
Command Parameter:	None
Return Parameter:	None
Function:	Saves the current Parameters to EEPROM and puts the camera in automatic mode.
Mode:	A/M
Tools:	All

2.9 Command:EEND

Command:	"EEND"
Return:	$
Command Parameter:	-
Return Parameter:	-
Mode:	A
Tools	-
Function:	Ends the Automatic Mode

2.10 Command:PASS

Command:	"PASS -P<1234567>"
Return:	"MENU" or "PASS -S<7654321>"
Command Parameter:	P<...> -> (string) Camera Pin Number
Return Parameter:	S<...> -> (string) Camera Serial Number

Mode:	A
Tools	ALL
Function:	Send The PIN Number to the Camera. Sends the Camera in Menu Mode if Correct. Comes only when the Camera doesn't have a pin.

2.11 Command:NAME

Command:	"NAME -D<aaaaaaaaaaaaaaa>"
Return	"NAME"
Command Parameter	D<...> -> (string) Name of Data File. (up to 14 chars)
Return Parameter:	-
Mode	M
Tools	ALL
Function	Sets the Name of the Current Data File.

2.12 Command:SFKZ

Command:	"SFKZ"
Return	"SFKZ"
Command Parameter:	not yet
Return Parameter:	-
Mode:	M/A
Tools:	-
Function:	Show Cross on Screen

2.13 Command:SSEL

Command:	"SSEL"
Return	"SCHG"
Command Parameter:	None
Return Parameter:	see "SCHG"
Mode:	M
Tools:	Communication
Function:	Get Current Parameters for Serial Protocol

2.14 Command:SCHG

Command:	"SCHG -a%u -k%u -n%u -s%u -S%u -e%u –

	E%u -t%u -w%u"
Return:	"SCHG -a%u -k%u -n%u -s%u -S%u -e%u – E%u -t%u -w%u"
Command Parameter:	a -> (unsigned) Active (1 = activ, 0 = not active) k -> (unsigned) ascii code to use for ack n -> (unsigned) ascii code to use for nack s -> (unsigned) ascii code to use for first start S -> (unsigned) ascii code to use for second start e -> (unsigned) ascii code to use for first end E -> (unsigned) ascii code to use for second end t -> (unsigned) ascii code to use for separator w -> (unsigned) waittime
Return Parameter:	Same as Command.
Mode:	M
Tools:	Communication
Function:	Set Current Parameters for Serial Protocol

2.15 Command:HRUN

Command:	"HRUN -w%u -r%u"
Return:	"HRES -G%u -P%u -p%u -T%u -S%u -L%u -H%u" "\n-I000 -V%lu " "\n-I001 -V%lu " "\n-I%03d -V%lu " "\n-I... -V... " "\n-I255 -V%lu "
Command Parameter:	w -> (unsigned) Window number. r -> (unsigned) Resolution.(*)
Return Parameter:	G -> (unsigned) Result Type: 0 = No Peaks 1 = 1 Peak 2 = 2 Peaks P -> (unsigned) Grey Value 1st Peak p -> (unsigned) Grey Value 2nd Peak T -> (unsigned) Threshold = (P + p)/2 S -> (unsigned long) Sum Pixels (**) L -> (unsigned long) Sum Pixels under Threshold H -> (unsigned long) Sum Pixels above Threshold I -> Greyvalue (0-255) V -> Number of Pixels with Greyval.
Function:	Runs a histogram in a window.
Mode:	A/M
Tools:	Histogram
	(*) optional, resolution = 1. (**) May be deleted in later versions.

2.16 Command:BRUN

Command: "BRUN -Bn"

Return:
"BNUM -a%d -T%d -e%d s%d S%d L%d l%d H%d h%d c%d C%d P%d E%d G%d"
BRES -R%d -e%d -X%d -Y%d -x%d -y%d -b%d -h%d -f%u -c%d -M%d -I%c -S%d"
"\n -G<string>"
"\n -H<%d,%d,%d...>"
"\n -F<%lu>"

Command Parameter: B -> (int) Blob number (1-16)
Return Parameter: "BNUM ..."
a -> Number of Results to Follow
T -> Blob Result Flags
???
e -> Error for Window

Followed by:
s -> Number of Blobs Area too Small
S -> Number of Blobs Area too Big
L -> Number of Blobs width too Long
l -> Number of Blobs width too Short
H -> Number of Blobs Height too High
h -> Number of Blobs Height too Short
c -> Number of Blobs Form Factor too Low
C -> Number of Blobs Form Factor too High
P -> Bad Image
E -> Number of Blobs Score too Low
G -> Number of Blobs Not in Verify String ???
"BRES ..."
R -> Result Number (1-16)
e -> Result Error
???
X -> Center of Mass X. (mm if Calibrated)
Y -> Center of Mass Y. (mm if Calibrated)
x -> Center of Bounding Rectangle (pixel)
y -> Center of Bounding Rectangle (pixel)
b -> Width (pixel)
h -> Height (pixel)
f -> Area (pixel)
c -> Form Factor
M -> Model Number ???
I -> Model ID (type code ???)
S -> Model Score
After all "BRES"
G<...> -> String (Verify or Read)
H<...> -> Type ID's Seperated by Commas
F<...> -> Total Area of Blobs (Kleber)

Function: Runs the given blob.

Mode: A/M
Tools: Blob

(*) Actual Result String Depends on Flags!

2.17 Command:BTRN

Command:	"BTRN -Bn -Tn -Sn"
Return:	"BNUM ..." "BRES ..."
Command Parameter:	B -> (int) Blob number (1-16) T -> (int) Type (0 = Dark, 1 = Light) S -> (int) How to train (optional): 0: New train one blob. 1: Set threshold only. 2: New train with more than one blob. 3: Add more blobs. 4: Init blob position.
Return Parameter:	see "BRUN"
Function:	Sets the blob parameter by Training.
Mode:	A/M
Tools:	Blob

2.18 Command:BSCW

Command:	"BSCW -B%u -T%u"
Return:	"BSCW -B%d -e%d -m%d -M%d"
Command Parameter:	B -> (int) Blob number (1-16) T -> (int) Type 0 = Dark Blob 1 = Light Blob
Return Parameter:	B -> (int) Blob number (1-16) e -> error ??? m ->New Min Schwelle M ->New Max Schwelle
Mode:	M/A
Tools:	Blob
Function:	Set the Grey Schwelle for a Blob Window

2.19 Command:BSHA

Command:	"BSHA -B%u"
Return:	"BSHA"
Command Parameter:	B -> Blob number (1-16)
Return Parameter:	-
Mode:	M
Tools:	Blob
Function:	Show the Blobs Black.

2.20 Command:BKLB

Command:	"BKLB -B%d -S%d"
Return:	"BKLB -B%d -e%d -f%lu -F%lu"
Command Parameter:	B -> (int) Blob number (1-16) S -> (int) Type 7 = New Statistics 8 = Add Statistics
Return Parameter:	B -> (int) Blob number (1-16) e -> error ??? f -> New Min Area (= Result Area -10%) F -> New Max Area (= Result Area +10%)
Mode:	M
Tools:	Blob
Function:	Calculates Kleber Statistics

2.21 Command:BSEL

Command:	"BSEL -B%u"
Return:	"BCHG -B%u -T%u -w%u -a%u -P%u -m%u -M%u -l%u -L%u -h%u -H%u -s%u -S%u -f%lu -F%lu -x%u -y%u -n%u -q%u -Q%u -p%u -c%u -C%u -E%u -G<string>"
Command Parameter:	B -> (unsigned) Blob Number (1-25 for Version < 2.00 else 1-30)(*)
Return Parameter:	See "BCHG"
Mode:	M
Tools:	Blob
Function:	Get the Parameters for a Blob. (*)for Version < 2.00 : blob 17 is train blob blob 18 is calibration blobs 21 - 24 are reference for Version >= 2.00 : blob 29 is train blob blob 30 is calibration blobs 25 - 28 are reference

2.22 Command:BCHG

Command:	"BCHG -B%u -T%u -w%u -a%u (*) -m%u -M%u -l%u -L%u -h%u -H%u -s%u -S%u -f%lu -F%lu -x%u -y%u -n%u -q%u -Q%u -p%u -c%u -C%u -E%u -G<string>"
Return:	"BCHG -B%u -T%u -w%u -a%u -P%u -m%u -M%u -l%u -L%u -h%u -H%u -s%u -S%u -f%lu -F%lu -x%u -y%u -n%u -q%u -Q%u -p%u -c%u -C%u -E%u -G<string>"

Command Parameter:	B -> Blob Number (1-25 for Version < 2.00 else 1-30) T -> Result Flags (Blob Status) for "BRUN" 0x0001 Center of Mass (BLB_RES_SP) 0x0002 Center (BLB_RES_MP) 0x0004 Width + Height (BLB_RES_BH) 0x0008 Area (BLB_RES_FL) 0x0010 Formfactor (BLB_RES_SM) 0x0020 Model ID (BLB_RES_MID) 0x0040 Model Name (BLB_RES_MERK) 0x0080 Model Score (BLB_RES_MSCR) 0x0200 Use Init Pos. (BLB_RES_INIT) 0x0400 Read String (BLB_RES_RSTR) 0x0800 Verify String (BLB_RES_VSTR) 0x1000 Type ID (BLB_RES_TYP) 0x2000 Kleber (BLB_RES_KLEBER) 0x4000 Vollstandigkeit (BLB_RES_VOLLST) > Window Number (always == blob number!) a -> Automatic Schwelle if == 1 m -> Min Schwelle M -> Max Schwelle l -> Min Length for a Blob (width) L -> Max Length for a Blob (width) h -> Min Height for a Blob H -> Max Height for a Blob s -> Min Size for a Single Blob (connectitivity) S -> Max Size for a Single Blob (connectitivity) F -> Max Size for all Blobs in a Window (Kleber) x -> Resolution in X (default = 1) y -> Resolution in Y (default = 1) n -> Number of Blobs to use for Training q -> Min Number of Blobs at Runtime Q -> Max Number of Blobs at Runtime p -> Mapping Type 1 = Connectivity 2 = Region ??? c -> Min Formfactor C -> Max Formfactor E -> Min Model Score (0 - 1024) G<...> -> String to Verify
Return Parameter:	Same as Command except (*) P -> Polarity for Auto-Schwelle 0 = Dark Blobs 1 = Light Blobs
Mode:	M
Tools:	Blob
Function:	Change Parameters for a Blob (*) Polarity cannot be set with BCHG - It is set with the Parameter -T in BTRN

2.23 Command:BCAL

Command:	"BCAL -Tn -Xn -Yn"
Return:	"BNUM ..."

"BRES ..."

Command Parameter: T -> (unsigned) Blob Type (0 = Dark, 1 = Light).(*)
X -> (unsigned) X Dimension.(*)
Y -> (unsigned) Y Dimension.(*)

Return Parameter: see "BRUN"

Function: Calibrates the Blob using 4 points.

Mode: A/M
Tools: Blob

(*)(optional if already set)

2.24 Command:KRUN

Command: "KRUN"

SAME AS BCAL -

2.25 Command: CSEL

Command: "CSEL"

Return: "CCHG -A%d -I%d -T%d -X%d -Y%d "

Command Parameter: -
Return Parameter: see "CCHG"

Mode: M
Tools: Blob + Calibration (RG)

Function: Get the Calibration Parameters/Status

2.26 Command:CCHG

Command: "CCHG -A%d (*) -T%d -X%d -Y%d "

Return: "CCHG -A%d -I%d -T%d -X%d -Y%d "

Command Parameter: A -> Active
1 = Use Calibration
0 = Return Pixel Values
T -> Polarity
0 = Search Dark Blobs
1 = Search Light Blobs
X -> Distance between Marks in X (Calibration Plate)
Y -> Distance between Marks in Y (Calibration Plate)

Return Parameter: Same as Command except (*)
I -> Calibration Valid

Mode: M/A
Tools: Blob + Calibration (RG)

Function:	Change the Calibration Parameters. (*) Calibration Valid can only be set by Successful Calibration. (see CRUN)

2.27 Command:FRUN -

Command:	"FRUN -F%d"
Return:	"FNUM -F%d -a%d -e%lu" "\n FRES -R1 -e%d " "\n -G<string>" "\n -H<%d,%d,%d...>" "\n -F<%lu>" "\n FRES -R%d -e%d " "\n -G<string>" "\n -H<%d,%d,%d...>" "\n -F<%lu>" "\n FRES -Rn -e%d " "\n -G<string>" "\n -H<%d,%d,%d...>" "\n -F<%lu>"
Command Parameter: Return Parameter:	F -> Blob Ablauf Number (1-4) "FNUM ..." a -> Number of Results to Follow e -> Error for All Windows (long) Bits set for all Blob Windows with Errors. "FRES ..." R -> Result Number (1-16) e -> Result Error ??? G<...> -> String (Verify or Read) H<...> -> Type ID's Seperated by Commas F<...> -> Total Area of Blobs (Kleber) (Not Yet Implemented!)
Mode: Tools:	M/A Blob
Function:	Run a Blob Ablauf.

2.28 Command:FIRF

Command:	"FIRF -F%d"
Return:	"BNUM ..." "BRES ..."
Command Parameter: Return Parameter:	F -> Ablauf Number (1-4) see "BRUN"
Mode: Tools:	M Blob

Function:	Initialize Reference for an Anlauf

2.29 Command:FIRF

Command:	"FIRF -F%d"
Return:	"BNUM ..." "BRES ..."
Command Parameter:	F -> Ablauf Number (1-4)
Return Parameter:	see "BRUN"
Mode:	M/A
Tools:	Blob
Function:	Run the Reference for an Anlauf and Shift the Windows

2.30 Command:FSHA

Command:	"FSHA -F%d"
Return:	"FSHA"
Command Parameter:	F -> Ablauf Number (1-4)
Return Parameter:	-
Mode:	M
Tools:	Blob
Function:	Show all the Blobs in the Ablauf (see "BSHA")

2.31 Command:FSEL

Command:	"FSEL -F%d"
Return:	"FCHG ..."
Command Parameter:	F -> Ablauf Number (1-4)
Return Parameter:	see FCHG
Mode:	M
Tools:	Blob
Function:	Get the Parameters for a Blob Ablauf if version >= 2.00

2.32 Command:FCHG

Command:	"FCHG -F%u -A%lu -B%lu -R%d -T%d"
Return:	"FCHG -F%u -A%lu -B%lu -R%d -T%d" else

Command:	"FCHG -F%u -A%u -R%d -T%d"
Return:	"FCHG -F%u -A%u -R%d -T%d"
Command Parameter:	F -> Ablauf Number (1-4) A -> Bits for ACTIVE (*) Blob Windows Version < 2.00 bits 0-3 Version >= 2.00 bits 0-24 B -> Bits for SELECTED Blob Windows Version >= 2.00 bits 0-24 R -> Use Reference. 1 = Use Reference 0 = No Reference T -> Ablauf Type 1 = Read/Verify 2 = Type Identify 3 = Kleber 4 = Vollstaendigkeit
Return Parameter:	Same as Command
Mode:	M
Tools:	Blob
Function:	
	(*) For Version >= 2.00 Active Windows must be Selected First!

2.33 Command:FALL

Command:	"FALL -F%d -m%d -M%d"
Return:	"FCHG -F%u -A%lu -B%lu -R%d -T%d"
Command Parameter:	F -> Ablauf Number (1-4) m ->Min Schwelle for all SELECTED Blobs M ->Max Schwelle for all SELECTED Blobs
Return Parameter:	see "FCHG"
Mode:	M
Tools:	Blob
Function:	Sets the Schwelle for all the blobs in an Ablauf and Shows the Blobs (see FSHA)

2.34 Command:LTRN

Command:	"LTRN -B%u -M%u -N%u"
	Return: "LCHG -M%u -A%u -I%u\n" "-L1 -V%lu\n" "-L2 -V%lu\n" "-L... -V%lu\n" "-L... -V%lu\n" "-L32 -V%lu\n"
Command Parameter:	B -> Blob Number to use for Train M ->Model Number to Train (1-64) 1-46 = Font

	51-64 = Type N -> Model Code (ascii value or type ID)
Return Parameter:	M -> Model Number (1-64) A -> Active Flag 1 = Model Selected (Active) 0 = Model Not Active I -> Model Code (ascii value or type ID) L -> 1-32 Line Number V -> (unsigned long) Value at Line
Mode:	M/A
Tools:	Blob + Models
Function:	Trains a Model using the given Blob.

2.35 Command:LSHA

Command:	"LSHA -M%u"
Return:	"LSHA"
Command Parameter:	M -> Model Number to Show (0-64) 0 = Show All
Return Parameter:	-
Mode:	M/A
Tools:	Blob + Models
Function:	Show a Model

2.36 Command:LSEL

Command:	"LSEL -M%u"
Return:	"LCHG -M%u -A%u -I%u\n" "-L0 -V%lu\n" ??? 0 or 1? "-L2 -V%lu\n" "-L... -V%lu\n" "-L... -V%lu\n" "-L31 -V%lu\n"
Command Parameter:	M -> Model Number (1-64)
Return Parameter:	M -> Model Number (1-64) A -> Active Flag 1 = Model Selected (Active) 0 = Model Not Active I -> Model Code (ascii value or type ID) L -> 1-32 Line Number V -> (unsigned long) Value at Line
Mode:	M/A
Tools:	Blob + Models
Function:	Select a Model, Returns all Model Parameters.

2.37 Command:LCHG

Command:	"LCHG -M%u -A%u -I%u" (*)
Return:	"LCHG -M%u -A%u -I%u\n" "-L0 -V%lu\n" ??? 0 or 1? "-L2 -V%lu\n" "-L... -V%lu\n" "-L... -V%lu\n" "-L31 -V%lu\n"
Command Parameter:	M -> Model Number to Change A -> Activate 1 = Active 0 = Deactivate I -> Model Code (ascii value or type ID)
Return Parameter:	same as "LSEL"
Mode:	M
Tools:	Blob + Models
Function:	Change Model Parameters. (*) To Change Model Line Values see "LMDL"

2.38 Command:LMDL

Command:	"LMDL -M%u -A%u -I%u " "LMDL -L0 -V%lu" "LMDL -L1 -V%lu" "LMDL -L.. -V%lu" "LMDL -L31 -V%lu" "LMDL -M%u -A%u -I%u " "LMDL -L0 -V%lu" "LMDL -L1 -V%lu" "LMDL -L.. -V%lu" "LMDL -L31 -V%lu" "LMDL -M%u -A%u -I%u " ... ... until "SMDL" or "EMDL"
Return:	"LMDL -e%u"
Command Parameter:	M -> Model Number to Change A -> Activate 1 = Active 0 = Deactivate I -> Model Code (ascii value or type ID) L -> Model Line (0-31) ??? V -> (unsigned long) Value at Line
Return Parameter:	e -> error ???
Mode:	M
Tools:	Blob + Models
Function:	Load a Model over the Line. Puts the Camera in

Load
Mode until the Command "SMDL" (save) or "EMDL"(abort).

2.39 Command:SMDL

Command:	"SMDL"
Return:	"LMDL -e0"
Command Parameter:	-
Return Parameter:	e -> Error (always 0)
Mode:	M (load model mode only!)
Tools:	Blob + Models
Function:	Ends Load Model Mode and saves all models.

2.40 Command:EMDL

Command:	"EMDL"
Return:	"LMDL -e0"
Command Parameter:	-
Return Parameter:	e -> Error (always 0)
Mode:	M (load model mode only!)
Tools:	Blob + Models
Function:	Ends Load Model Mode and Without Saving.

2.41 Command:WSEL

Command:	"WSEL -w%u"
Return:	"WCHG -w%u -x%u -y%u -b%u -h%u -t1 -c%d"
Command Parameter:	w -> (unsigned) Window Number (1-25 Version < 2.00 else 1-30)
Return Parameter:	w -> (unsigned) Window Number (1-25 Version < 2.00 else 1-30) x -> (unsigned) X Coordinate (left) y -> (unsigned) Y Coordinate (top) b -> (unsigned) Width h -> (unsigned) Height t -> not used any more c -> (unsigned) Color (0 -255)
Mode:	M
Tools:	Blob/Barcode
Function:	Get Window Parameters.

2.42 Command:WCHG

Command:	"WCHG -w%u -x%u -y%u -b%u -h%u -t1 -c%d"
Return:	"WCHG -w%u -x%u -y%u -b%u -h%u -t1 -c%d"
Command Parameter:	w -> (unsigned) Window Number (1-25 for Version < 2.00 else 1-30) x -> (unsigned) X Coordinate (left) y -> (unsigned) Y Coordinate (top) b -> (unsigned) Width h -> (unsigned) Height t -> not used any more c -> (unsigned) Color (0 -255)
Return Parameter:	Same as Command
Mode:	M
Tools:	Blob/Barcode

Function:	Change Window Parameters.

2.43 Command:WSHA

Command:	"WSHA -w%u"
Return:	"WSHA"
Command Parameter:	w -> Window Number to Show. 0 = Show All.
Return Parameter:	-
Mode:	M/A ???
Tools:	Blob/Barcode
Function:	Show a Window.

2.44 Command:RBCR

Command:	"RBCR -Rn"
Return:	"RRES -an -en\n" (*) "RSTR -<s>"
Command Parameter:	R -> (unsigned) BCR Number
Return Parameter:	a -> (unsigned) Result ID e -> (unsigned) Error Code <s> -> (char *) String
Function:	Runs a bcr.
Mode:	A/M
Tools:	BCR
	(*) In automatic only the string is returned.

2.45 Command:RSEL

Command:	"RSEL -???"
Return:	"RCHG -???"
Command Parameter:	TBD
Return Parameter:	see "RCHG -???"
Function:	Get Current Parameters for BCR
Mode:	M
Tools:	BCR

2.46 Command:RCHG

Command:	"RCHG -???"

Return:	"RCHG -???"
Command Parameter:	TBD
Return Parameter:	TBD
Function:	Change Current Parameters for BCR
Mode:	M
Tools:	TBD

2.47 Command: RSEL

Command:	"RSEL" "RCHG" "RRUN" "RINI"
Return:	
Function:	
Mode:	
Tools:	
Reference Parameter	-> Not Implemented

2.48 Command: "MRUN

Command:	"MRUN -M%u"
Return:	"MRES -R%02d -x%04d -y%04d -a%04d -d%04d -r%04d -e%02d" (*)
Command Parameter:	M -> (unsigned) Merkmal Number (1-16)
Return Parameter:	R -> (unsigned) Merkmal ID (1-16) x -> (int) Result X Position y -> (int) Result Y Position a -> (int) Result Angle d -> (int) Result Distance r -> (int) Result Radius e -> (int) Result Error ???
Mode:	M/A
Tools:	Messtechnik
Function:	Run a single Merkmal. (*) In automatic only the result string is returned.

2.49 Command:MINI

Command:	"MINI -M%u"
Return:	"MRES -R%02d -x%04d -y%04d -a%04d -d%04d -r%04d -e%02d"

Command Parameter:	M -> (unsigned) Merkmal Number (1-16)
Return Parameter:	see "MRUN"
Mode:	M/A
Tools:	Messtechnik
Function:	Initialize the position of a Merkmal for Future Reference.

2.50 Command:MSEL

Command:	"MSEL -Mn"
Return:	"MCHG"
Command Parameter:	M -> (unsigned) Merkmal Number (1-16)
Return Parameter:	see "MCHG"
Mode:	M
Tools:	Messtechnik
Function:	Get Current parameters for a Merkmal

2.51 Command: MCHG

Command: (line) "MCHG -M%u -T%u -C%u -x%u -y%u -b%u -l%u -a%u -p%u -s%u -n%u -c%u" (circ)

"MCHG -M%u -T%u -K%u -x%u -y%u -r%u -R%u -p%u -s%u -n%u -c%u"

Return:

"MCHG -M%u -T%u\n"
(line1) "-C1 -x%u -y%u -b%u -l%u -a%u -p%u -s%u -n%u -c%u\n"
(*)(line2) "-C2 -x%u -y%u -b%u -l%u -a%u -p%u -s%u -n%u -c%u\n"
(circ) "-K1 -x%u -y%u -r%u -R%u -p%u -s%u -n%u -c%u"

Command Parameter:

M -> (unsigned) Merkmal Number (1-16)
(unsigned) Merkmal Type
1 = Single Line
2 = Edge
3 = Circle
6 = Corner
C -> (unsigned) Caliper ID to Change (1 or 2)
K -> (unsigned) Circle ID (=1)
x -> (unsigned) Caliper(ID) X Position (middle,pixel)
X-> (unsigned) Caliper(ID) Init X Position
y -> (unsigned) Caliper(ID) Y Position (middle,pixel)
Y-> (unsigned) Caliper(ID) Init Y Position
b -> (unsigned) Caliper(ID) Width (line caliper)
l -> (unsigned) Caliper(ID) Length (line caliper)
a -> (unsigned) Caliper(ID) Angle (line caliper)

A -> (unsigned) Caliper(ID) Init Angle (line caliper)
r -> (unsigned) Caliper(ID) First Radius (circle caliper)
R -> (unsigned) Caliper(ID) Second Radius (circle caliper)
Q -> (unsigned) Caliper(ID) Init Radius
D -> (unsigned) Caliper(ID) Init Distance
p -> (unsigned) Caliper(ID) Polarity
0 = Light->Dark
1 = Dark->Light
s -> (unsigned) Caliper(ID) Schwelle (0-255)
c -> (unsigned) Caliper(ID) Draw Color (0-255)

Return Parameter: Same as Command.

Mode: M
Tools: Messtechnik

Function: Set Current parameters for a Merkmal and Caliper

(*) Caliper 2 only if corner type

2.52 Command:ARUN

Command: "ARUN -A%u"

Return: "ANUM -a%02d -e%02d\n"
"ARES -R%02d -x%04d -y%04d -a%04d -d%04d -r%04d -e%02d\n"

Command Parameter: A -> (unsigned) Ablauf Number (1-???)
Return Parameter: "ANUM"
a -> (int) Number of Results to follow (1-16).
e -> (int) Ablauf Global Error
???

"ARES"
R -> (int) Result Number (1-16).
x -> (int) X Coordinate
y -> (int) Y Coordinate
a -> (int) Angle
d -> (int) Distance
r -> (int) Radius
e -> (int) Result Error

Mode: M/A
Tools: Messtechnik

Function: Run an Ablauf.

2.53 Command:AINI

Command: "AINI -A%d -T%d"

Return: "ANUM -a%02d -e%02d\n"
"ARES -R%02d -x%04d -y%04d -a%04d -d%04d -r%04d -e%02d\n"

Command Parameter:	A -> (int) Ablauf Number T -> (int) Tolerance Number
Return Parameter:	same as "ARUN"
Mode:	M
Tools:	Messtechnik
Function:	Initializes the Tolerance Null Values for a Measurement in the Ablauf with the Current Results.

2.54 Command:ASEL

Command:	"ASEL -A%u"
Return:	"ACHG -A%u -Ra%u -Rb%u -Rc%u -Rd%u -Re%u -Rf%u -Rg%u -Rh%u -Ri%u -Rj%u -Rk%u -Rl%u -Rm%u -Rn%u -Ro%u -Rp%u -Ba%u -Bb%u -Bc%u -Bd%u -Be%u -Bf%u -Bg%u -Bh%u -Bi%u -Bj%u -Bk%u -Bl%u -Bm%u -Bn%u -Bo%u -Bp%u
Command Parameter:	A -> Ablauf Number (1-4)
Return Parameter:	see "ACHG"
Mode:	M
Tools:	Messtechnik
Function:	Get the Parameter for an Ablauf

2.55 Command: ACHG

Command:	"ACHG -A%u -M%u -Ra%u -Rb%u -Rc%u -Rd%u -Re%u -Rf%u -Rg%u -Rh%u -Ri%u -Rj%u -Rk%u -Rl%u -Rm%u -Rn%u -Ro%u -Rp%u -Ba%u -Bb%u -Bc%u -Bd%u -Be%u -Bf%u -Bg%u -Bh%u -Bi%u -Bj%u -Bk%u -Bl%u -Bm%u -Bn%u -Bo%u -Bp%u

Return:	"ACHG -A%u -M%u -Ra%u -Rb%u -Rc%u -Rd%u -Re%u -Rf%u -Rg%u -Rh%u -Ri%u -Rj%u -Rk%u -Rl%u -Rm%u -Rn%u -Ro%u -Rp%u -Ba%u -Bb%u -Bc%u -Bd%u -Be%u -Bf%u -Bg%u -Bh%u -Bi%u -Bj%u -Bk%u -Bl%u -Bm%u -Bn%u -Bo%u -Bp%u
Command Parameter:	A -> Ablauf Number (1-???) M ->Flags for Active Merkmals for this Ablauf (*) Rx->Merkmal Number for a Result (1-16) Bx->Merkmal Number for the Basis of Result Rx 0 = Calibration (absolute coordinate) n = Another Merkmal
Return Parameter:	Same as Command.
Mode:	M
Tools:	Messtechnik
Function:	Set the Parameters for an Ablauf (*) Active merks are set Bitwise. All active merks are run and then the results are calculated using Rx and Bx.

2.56 Command:TCHG

Command:	"TCHG –A %u -T%u -K%d -L%d -M%d -N%d -O%d -P%d -x%d -y%d -w%d -d%d -r%d -X%d -Y%d -W%d -D%d -R%d\n"
Return:	"TCHG -A%u -T%u -K%d -L%d -M%d -N%d -O%d -P%d -x%d -y%d -w%d -d%d -r%d -X%d -Y%d -W%d -D%d -R%d
Command Parameter:	A -> (unsigned) Ablauf Number (1-???) T -> (unsigned) Result Number (1-16) K -> (unsigned) Active Flag 1 = Activ 0 = Not Activ L -> (int) Null Value for X Position M ->(int) Null Value for Y Position N -> (int) Null Value for Angle O ->(int) Null Value for Distance P -> (int) Null Value for Radius x -> (int) Min Tolerance for X Position y -> (int) Min Tolerance for Y Position w -> (int) Min Tolerance for Angle d -> (int) Min Tolerance for Distance r -> (int) Min Tolerance for Radius X -> (int) Max Tolerance for X Position Y -> (int) Max Tolerance for Y Position W ->(int) Max Tolerance for Angle D -> (int) Max Tolerance for Distance R -> (int) Max Tolerance for Radius
Return Parameter:	Same as Command
Mode:	M
Tools:	Messtechnik

Function:	Change the Tolerance Parameters for one Measurement in an Ablauf

2.57 Command:KRUN

Command:	"KRUN"

Return:	"KRES -x%04d -y%04d -f%04d -g%04d -e%02d\n"
	or
	"KEER -e%02d\n" ??? not standard -> Change!
	
	if(cres->error)
	print(,cres->error);
	else
	print (,(int)(cres->xpos),(int)(cres->ypos),
	(int)(cres->xfakt), (int)(cres->yfakt),cres->error);

Command Parameter:	-
Return Parameter:	x -> (int) Origin X in Pixel y -> (int) Origin Y in Pixel f -> (int) Factor in X (mm/pixel) (??? * 1000?) g -> (int) Factor in Y (mm/pixel) e -> (int) Error Code. ???
Mode:	M/A
Tools:	Messtechnik
Function:	Run the Calibration.

2.58 Command:KSEL

Command:	"KSEL"
Return:	"KCHG -A%d -X%d -Y%d\n" (line1) "-C1 -x%u -y%u -b%u -l%u -a%u -p%u -s%u -n%u -c%u\n" (line2) "-C2 -x%u -y%u -b%u -l%u -a%u -p%u -s%u -n%u -c%u\n" (line3) "-C3 -x%u -y%u -b%u -l%u -a%u -p%u -s%u -n%u -c%u\n" (line4) "-C4 -x%u -y%u -b%u -l%u -a%u -p%u -s%u -n%u -c%u\n"
Command Parameter:	-
Return Parameter:	see "KCHG"
Mode:	M
Tools:	Messtechnik
Function:	Get the Current Values for the Calibration.

2.59 Command:KCHG

Command:	"KCHG -A%d -X%d -Y%d -C%d -x%u -y%u -b%u -l%u -a%u -p%u -s%u -n%u -c%u"

Return:	"KCHG -A%d -X%d -Y%d\n" (line1) "-C1 -x%u -y%u -b%u -l%u -a%u -p%u -s%u -n%u -c%u\n" (line2) "-C2 -x%u -y%u -b%u -l%u -a%u -p%u -s%u -n%u -c%u\n" (line3) "-C3 -x%u -y%u -b%u -l%u -a%u -p%u -s%u -n%u -c%u\n" (line4) "-C4 -x%u -y%u -b%u -l%u -a%u -p%u -s%u -n%u -c%u\n"
Command Parameter:	A -> Active 1 = Activ (mm values) 0 = Not Activ (pixel values) X -> Length in X (Calibration Plate) Y -> Length in Y (Calibration Plate) C -> (unsigned) Caliper ID to Change (1-4) x -> (unsigned) Caliper(ID) X Position (middle,pixel) y -> (unsigned) Caliper(ID) Y Position (middle,pixel) b -> (unsigned) Caliper(ID) Width (line caliper) l -> (unsigned) Caliper(ID) Length (line caliper) a -> (unsigned) Caliper(ID) Angle (line caliper) r -> (unsigned) Caliper(ID) First Radius (circle caliper) R -> (unsigned) Caliper(ID) Second Radius (circle caliper) p -> (unsigned) Caliper(ID) Polarity 0 = Light->Dark 1 = Dark->Light s -> (unsigned) Caliper(ID) Schwelle (0-255) n -> (unsigned) Caliper(ID) Number of Lines (???) c -> (unsigned) Caliper(ID) Draw Color (0-255)
Return Parameter:	Same as Command except ALL Caliper Data is Sent.
Mode:	M
Tools:	Messtechnik
Function:	Change the Calibration Parameters
Command:	""
Return:	""
Command Parameter:	
Return Parameter:	
Mode:	M
Tools:	
Function:	