



# WORKSWELL WIRIS COMMAND CONTROL PROTOCOL

## USER MANUAL

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## 1 User Information

### 1.1 Typographic Conventions

Following typographic conventions are used in this User Manual:

- UPPER CASE is used for the names of keys, buttons and menu items
- COURIER is used for file names and paths
- Italic is used for important information and document names
- underline is used for the links to other sections, for function names or Internet sites

### 1.2 Help and Support

For technical questions that were not answered in this User Manual feel free to contact your dealer or visit the product website at [www.drone-thermal-camera.com](http://www.drone-thermal-camera.com), or contact our support team via [support.workswell.eu](mailto:support.workswell.eu).

### 1.3 Updates

The primary aim of Workswell s.r.o. company is to supply their products in a way that meets the current needs of its users and at the same time to remove all the weaknesses that were found in their use as quickly as possible. For this reason, Workswell s.r.o. regularly releases updates for all their products.

Visit [my.workswell.eu](http://my.workswell.eu) to download the latest firmware release. The update process itself is described in a later section.

### 1.4 Firmware

Firmware is the „internal“ control program of the device. From the user’s point of view, only the official firmware released by Workswell s.r.o. company can be used for update of the device.

## 2 Revision history

1.0

- Initial release

200301

- Updated the commands for the latest FW version 1.4.4

220630

- Added commands for WIRIS AGRO
- Added commands for GIS-320

220815

- Fix mistakes in WIRIS AGRO commands
- Delete unused "set video location" command

220818

- Add commands for WWE

220825

- Add command to change HR camera resolution

221024

- New main image

220613

- New document format

- added ip setters

## 3 Overview

This chapter includes basic information about the WIRIS Communication Protocol.

### 3.1 Basic Information

Sometimes it is not possible to control the WIRIS device with RC controller. This protocol was designed as full alternative for the RC controller.

It gives the user an option to control the WIRIS with simple text based commands using different physical layers.

The protocol is currently compatible with five models of WIRIS:

- Workswell WIRIS PRO (WWP)
- Workswell WIRIS ENTERPRISE (WWE)
- Workswell WIRIS SECURITY (WWS)
- Workswell WIRIS ENTERPRISE (WWE)
- Workswell GIS-320 (GIS)
- Workswell WIRIS AGRO (CWI)

Differences between models will be noted. Commands enabled for WWP are also enabled for WWE unless specified otherwise.

### 3.2 Getting Help and Suggestions

The WIRIS Ethernet SDK was created as stable and robust as possible. Still, if you find any bugs, inconveniences or if you have any suggestions for improvement, please contact us at support@workswell.eu.

## 4 Physical Layers

Currently only CAN bus protocol UART are supported.

### 4.1 CAN Bus

CAN bus is a rugged, digital serial bus designed for industrial environments. To use it with WIRIS device, connect the CAN High (CANH) and CAN Low (CANL) wires to your device.

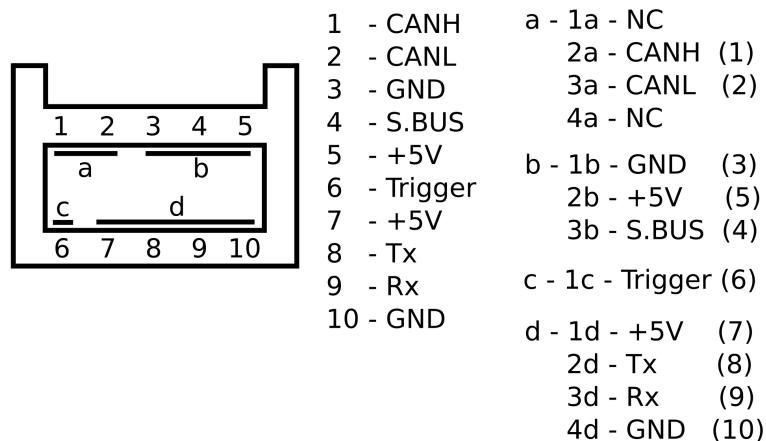


Figure 4.1 – Multicable pinout.

The CAN bus communication has following parameters:

- Bitrate 1000000 bps.
- Frame ID 0xA1 for command to the camera and ID 0xA2 for answer from the camera.
- 8 bytes of data in one frame.

#### 4.1.1 Message Dividing

Since the protocol text command and answer could not fit into one CAN frame, it has to be divided into several frames. The following protocol describes how to do it.

Byte	Function
1	Header: 0x02
2 to 3	Size of message (little-endian): N from 0x0000 to 0xFFFF
4	1th message character byte
5	2th message character byte
...	
N + 3	Nth message character bytes
N + 4	Footer: 0x03

Table 4.1 – Protocol parameters

For example, the basic command to test the functionality is HIWS and the answer for it is OK.

The communication bytes are as follows:

- Command: 0x02 | 0x05 | 0x00 | 0x48 | 0x49 | 0x57 | 0x53 | 0x0A | 0x03
- Answer: 0x02 | 0x03 | 0x00 | 0x4F | 0x4B | 0x0A | 0x03

## 4.2 UART

The universal asynchronous serial communication protocol can be used for WIRIS Commands. The UART has following parameters:

- Baud Rate 115200 bps.
- 5V logic.
- 8 data bits.
- No parity.
- 1 stop ans 1 start bit.
- No flow control.

The UART port is shared between MAVlink, GPS and WIRIS Command Control Protocol. Only one of these can be used in a given time. The used peripheral is automatically detected. The detection is resetted and repeated after each WIRIS reboot.

### 4.2.1 Detection

It can take up to seconds for WIRIS to detect that the Communication Protocol is being used, so the command HIWS should be repeated in a loop until OK answer is received. The command should be repeated with period between 10 and 100 milliseconds.

The detection must be repeated after each WIRIS reboot.

#### 4.2.2 Message

The commands and answers are serialized into UART protocol as follows:

Byte	Function
1	Header: 0x02
2 to 3	Size of message (little-endian): N from 0x0000 to 0xFFFF
4	1th message character byte
5	2th message character byte
...	
N + 3	Nth message character bytes
N + 4	Control sum of all message character bytes
N + 5	Footer: 0x03

Table 4.2 – Protocol parameters

For example, the basic command to test the functionality is HIWS and the answer for it is OK.

The communication bytes are as follows:

- Command: 0x02 | 0x05 | 0x00 | 0x48 | 0x49 | 0x57 | 0x53 | 0x0A | 0x45 | 0x03
- Answer: 0x02 | 0x03 | 0x00 | 0x4F | 0x4B | 0x0A | 0xA4 | 0x03

## 5 Communication protocol description

This chapter contains information about the protocol.

The most common responses are OK in case of success and ERR in case of error. When parameters are given or returned, they are separated by one space.

Note: Some commands work only for specific camera type. If so it is specified in the command description or in the header of the section describing certain command group. If unspecified the command is valid for all devices mentioned in ??

The parameters and return values can be either integers (denoted by [int] tag), floats (denoted by [float] tag) or strings defined as a list of discreet possibilities. The return values can also be strings (e.g. serial number, denoted by [string] tag) or lists (usually set of possible settings which can be dependent on camera calibration or current state). Lists can be consisted of strings, floats or integers (or their combination) and each entry is separated by a newline. Lists are indicated by { } around the type tags.

### 5.1 Command control protocol activation

Most commands from the command control protocol are initially locked behind a license. To unlock them, you need to enter correct license key. For more information about the license key for your camera, please contact the Workswell support team at support.workswell.cz. Once the license is entered, it persists through the camera restart and you do not need to enter it every time you are using the protocol.

#### 5.1.1 Activate / get activation status

command	1st parameter	answer
ACCP	LICENCE NUMBER	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
IACP		<ul style="list-style-type: none"> <li>■ TRUE</li> <li>■ FALSE</li> </ul>

## 5.2 Basic commands

### 5.2.1 Commands delimiter

The delimiter for command messages can be either LINE ('\n' character) or NULL ('\0' character). This delimiter is used for detecting the end of a command. The LINE is mainly useful for manual input via some basic TELNET client, the NULL is better for software development. Default value is LINE.

command	1st parameter	answer
SDLM	<ul style="list-style-type: none"> <li>■ NULL</li> <li>■ LINE</li> </ul>	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GDLM		<ul style="list-style-type: none"> <li>■ NULL</li> <li>■ LINE</li> </ul>

Example:

```
SDLM NULL
OK
GDLM
NULL
```

### 5.2.2 Check connection

Command used for checking the connection ("ping command")

command	answer
HIWS	OK

### 5.2.3 Basic camera information

Returns string with camera information. These commands work without the SDK licence set.

command	answer
GSRN	[string]serial number
GATN	[string]article number
GFWV	[string]firmware version

Example:

```
GSRN
20062-046-2305
```

#### 5.2.4 Camera temperature and fan power

The device internally measures temperature on several components. Each temperature value is in set temperature units see 5.5.

command	answer
GTCU	[float]CPU temperature
GTIC	[float]thermal core temperature
GTIN	[float]Internal electronic temperature
GFPW	[float]Fan power (0-1)

Example:

```
GTCU
32.2
```

#### 5.3 Menu navigation

For using the commands in normal mode (with HDMI output active) it is possible to emulate the keyboard control using the MOVE commands.

command	1st parameter	answer
MOVE	<ul style="list-style-type: none"> <li>■ UP</li> <li>■ DOWN</li> <li>■ CANCEL</li> <li>■ OK</li> </ul>	OK

Example:

```
MOVE OK
OK
```

#### 5.4 GPS

##### 5.4.1 Get GPS coordinates

Get the current GPS coordinates as long as it is provided to the camera; it relies on external source. Returns either N/A when GPS is not connected, INVALID when GPS data is not valid or the coordinates in following format:

LATITUDE 14.4444 S

LONGITUDE 57.5555 W

ALTITUDE 156.156

command	answer
GGPS	<ul style="list-style-type: none"> <li>■ N/A</li> <li>■ INVALID</li> <li>■ LATITUDE 14.4444 S</li> <li>■ LONGITUDE 57.5555 W</li> <li>■ ALTITUDE 156.156</li> </ul>

Example:

```
GGPS
LATITUDE 14.4444 S
LONGITUDE 57.5555 W
ALTITUDE 156.156
```

## 5.5 Units

The camera can operate in Kelvins (*K*), degrees Celsius ( $^{\circ}C$ ) or degrees Fahrenheit ( $^{\circ}F$ ). All temperatures used in this protocol are in the set scale without the unit specifier unless explicitly stated otherwise.

command	1st parameter	answer
STUT	<ul style="list-style-type: none"> <li>■ K</li> <li>■ C</li> <li>■ F</li> </ul>	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GTUT		<ul style="list-style-type: none"> <li>■ K</li> <li>■ C</li> <li>■ F</li> </ul>

Example:

```
STUT K
OK
GTUT
K
```

## 5.6 Wiris Pro, Wiris Enterprise and GIS thermal parameters

Please refer to the camera User Manual for more in-depth explanation of these parameters. All parameters in this section are valid only for Wiris Pro, Wiris Enterprise and GIS 320 cameras.

### 5.6.1 Range mode settings

Get/set the range mode

command	1st parameter	answer
SRMD	<ul style="list-style-type: none"> <li>■ AUTOMATIC</li> <li>■ MANUAL</li> <li>■ SPAN</li> </ul>	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GRMD		<ul style="list-style-type: none"> <li>■ AUTOMATIC</li> <li>■ MANUAL</li> <li>■ SPAN</li> </ul>

Example:

```
SRMD SPAN
OK
GRMD
SPAN
```

### 5.6.2 Manual range settings

Returns the currently set manual thermal range minimum and maximum (values for Manual Range).

command	1st parameter	2nd parameter	answer
SRMM	[float]min	[float]max	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GRMD			[float]min [float]max

Example:

```
SRMM 20.0 30.0
OK
GRMM
20.0 30.0
```

### 5.6.3 Span range settings

command	1st parameter	2nd parameter	answer
SRWC	[float]center	[float]window	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GRWC			[float]center [float]window

Example:

```
SRWC 20.0 30.0
OK
GRWC
20.0 30.0
```

### 5.6.4 Environment settings

Note: The possible settings depends on the unit lenses and calibration. Only values returned by 5.6.4.1 command are possible

command	1st parameter	2nd parameter	answer
SREN	[float]min	[float]max	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GREN			[float]min [float]max

Example:

```
SREN -25.0 150.0
OK
GREN
-25.0 150.0
```

#### 5.6.4.1 Get possible environment settings

command	answer
GREL	{[float]min [float]max}

Example:

```

GREL
-25.0 150.0
-40.0 550.0
100.0 1000.0
400.0 1500.0

```

## 5.7 WIRIS Security thermal parameters

Specific parameters for WWS thermal camera. All parameters in this section are valid only for Wiris Security devices.

### 5.7.1 Time stabilization settings

command	1st parameter	answer
STST	[float]<0s-5s>stabilization time	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GTST		[float]stabilization time

Example:

```

STST 2.4
OK
GTST
2.4

```

### 5.7.2 Hot/cold rejection settings

command	1st parameter	answer
SHRJ	[float]<0%-30%>Hot rejection	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GHRJ		[float]Hot rejection
SCRJ	[float]<0%-30%>Cold rejection	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GCRJ		[float]Cold rejection

Example:

```

SHRJ 25
OK
SCRJ 30
OK
GHRJ
25.0
GCRJ
30.0

```

## 5.8 WIRIS AGRO thermal parameters

Specific parameters for WIRIS AGRO thermal camera. All parameters in this section are valid only for Wiris Agro.

### 5.8.1 CWSI mode settings

command	1st parameter	answer
SCWM	<ul style="list-style-type: none"> <li>■ THEORETIC</li> <li>■ EMPIRICAL</li> <li>■ DIFFERENTIAL</li> </ul>	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GCWM		<ul style="list-style-type: none"> <li>■ THEORETIC</li> <li>■ EMPIRICAL</li> <li>■ DIFFERENTIAL</li> </ul>

Example:

```

SCWM EMPIRICAL
OK
GCWM
EMPIRICAL

```

### 5.8.2 Air temperature

Note: Works only for THEORETIC and DIFFERENTIAL mode

command	1st parameter	answer
SCAT	[float]air temperature	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GCAT		[float]air temperature

Example:

```
SCAT 20.0
OK
GCAT
20.0
```

### 5.8.3 Stress level settings

Note: Stress level settings works only in EMPIRICAL mode

Note: When setting the stress level no argument is accepted. The currently measured temperature at CENTER CROSS is taken as the new stress level

Note: There is minimal difference of 5°C between 100% and 0% stress level

#### 5.8.3.1 100 % stress level

command	answer
SUSL	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GUSL	[float]stress level temperature

Example:

```
SUSL
OK
GUSL
20.0
```

#### 5.8.3.2 0 % stress level

command	answer
SSSL	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GLSL	[float]stress level temperature

Example:

SLSL  
OK  
GLSL  
25.0

#### 5.8.4 Crop settings

Note: Crop settings works only in THEORETIC mode

command	1st parameter	answer
SCRP	[float] % relative humidity	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GRCP		[float] % relative humidity

Example:

SCRP 2  
OK  
GCRP  
2

#### 5.8.5 Relative humidity settings

command	1st parameter	answer
SCHY	[float]<1-3>crop index	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GCHY		[float]crop index

Example:

SCHY 50.0  
OK  
GCHY  
50.0

### 5.8.6 Intercept baseline settings

Note: Intercept baseline settings works only in THEORETIC mode

command	1st parameter	answer
SINB	[float] <0-10> intercept baseline	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GINB		[float] intercept baseline

Example:

```
SINB 2.0
OK
GINB
2.0
```

### 5.8.7 Slope baseline settings

Note: Slope baseline settings works only in THEORETIC mode

command	1st parameter	answer
SSLB	[float] <-5-0> Slope baseline	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GSLB		[float] Slope baseline

Example:

```
SSLB -2.0
OK
GINB
-2.0
```

### 5.8.8 CWSI getters

#### 5.8.8.1 d1 and d2 calculation parameters

Note: The parameters are valid only in THEORETIC mode

command	answer
GEDF	[float] d1
GEDS	[float] d2

Example:

```
GEDF
1.40
GEDS
-0.40
```

#### 5.8.8.2 CWSI extremes value

Returns the percents of CWSI for each extreme, similarly to GTEX command. The extreme consists out of value designation (MIN/MAX/CENTER) and the CWSI value (can be OUT\_OF\_RANGE or OFF in case values are not displayed, see 5.8.9). Each extreme takes one line.

command	answer
GCWP	[string]image values

Example:

```
GCWP
MAXIMUM 30.1
MINIMUM OUT\_OF\_RANGE
CENTER OUT\_OF\_RANGE
```

#### 5.8.8.3 CWSI graph ratios

Returns the percents for each part of the CWSI graph or NOT\_ENOUGH\_DATA.

command	answer
GCGR	<ul style="list-style-type: none"> <li>▪ [float]low [float]low medium [float]medium high</li> <li>▪ [float]high [float]extremely high</li> <li>▪ NOT_ENOUGH_DATA</li> </ul>

Example:

```
GCGR
10.0 20.0 30.0 40.0 0.0
```

Following commands refer to UI settings available only for WIRIS AGRO.

### 5.8.9 Display CWSI Value

This sets whether the CWSI value is being calculated and shown in the HDMI at the extreme cross position.

command	1st parameter	answer
SCWV	<ul style="list-style-type: none"> <li>■ TRUE</li> <li>■ FALSE</li> </ul>	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GCWV		<ul style="list-style-type: none"> <li>■ TRUE</li> <li>■ FALSE</li> </ul>

Example:

```
SCWV TRUE
OK
GCWV
TRUE
```

## 5.9 Appearance

These commands sets the HDMI output features.

### 5.9.1 Set layout

Set layout for the HDMI output.

command	1st parameter	answer
SLAY	<ul style="list-style-type: none"> <li>■ INSPECTION <sup>1</sup></li> <li>■ SECURITY</li> <li>■ FULLSCREEN</li> <li>■ PIP</li> </ul>	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>

<sup>1</sup> not available for WIRIS Security

Example:

```
SLAY SECURITY
OK
```

#### 5.9.1.1 Picture in picture transparency

The PiP layout has optional opacity for the thermo camera overlay in range from 10 to 100 in percent.

command	1st parameter	answer
STTY	[int]<10;100>opacity	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>

Example:

```
STTY 50
OK
```

### 5.9.2 Main camera settings

command	1st parameter	answer
SMCA	<ul style="list-style-type: none"> <li>■ THERMO</li> <li>■ VISIBLE</li> </ul>	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GMCA		<ul style="list-style-type: none"> <li>■ THERMO</li> <li>■ VISIBLE</li> </ul>

Example:

```
SMCA THERMO
OK
GMCA
THERMO
```

### 5.9.3 GPS info settings

command	1st parameter	answer
SGPI	<ul style="list-style-type: none"> <li>■ POSITION</li> <li>■ ALTITUDE_SPEED</li> </ul>	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GGPI		<ul style="list-style-type: none"> <li>■ POSITION</li> <li>■ ALTITUDE_SPEED</li> </ul>

Example:

```
SGPI POSITION
OK
GGPI
POSITION
```

## 5.10 Zoom

Note: While optical zoom (used on the visible spectrum camera) affects both the displayed video and encoded streams, the digital zoom used on the thermal camera only affect the HDMI output, the encoded RTSP stream and recorded video are NOT zoomed in.

### 5.10.1 Zoom in/zoom out

Zooms current main camera in (or both if the "zoom simultaneously" is chosen) one step.

command	answer
SZIN	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
SZOT	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>

Example:

 SZIN  
 OK

### 5.10.2 Zoom simultaneously

command	1st parameter	answer
SZSM	<ul style="list-style-type: none"> <li>■ TRUE</li> <li>■ FALSE</li> </ul>	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
SZOT		<ul style="list-style-type: none"> <li>■ TRUE</li> <li>■ FALSE</li> </ul>

Example:

 SZSM TRUE  
 OK  
 GZSM  
 TRUE

### 5.10.3 Thermal camera zoom

The discrete zoom steps can be defined either by zoom ration or by index of the zoom step. Only certain ratios are possible (see 5.10.3.1).

command	1st parameter	answer
SZTN	[int]index	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GZTV		[int]index [float]ratio

Example:

```
SZTN 4
OK
GZTV
5 4.000000
```

#### 5.10.3.1 Get list of possible thermal camera zooms

command	answer
GZTL	{[int]index [float]ratio}

Example:

```
GZTL
0 1.000000
1 1.200000
2 1.600000
3 2.000000
4 3.000000
5 4.000000
6 5.000000
7 6.000000
8 8.000000
9 10.000000
10 12.000000
```

### 5.10.4 Visible camera zoom

The discrete zoom steps can be defined either by zoom ration or by index of the zoom step. Only certain ratios are possible (see 5.10.4.1).

command	1st parameter	answer
SZVN	[int]index	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GZVV		[int]index [float]ratio

Example:

```
SZVN 4
OK
GZVV
4 3.000000
```

#### 5.10.4.1 Get list of possible thermal camera zooms

command	answer
GZVL	{[int]index [float]ratio}

Example:

```
GZVL
0 1.000000
1 1.200000
2 1.500000
3 2.000000
4 3.000000
5 4.000000
6 5.000000
7 6.000000
8 8.000000
9 10.000000
10 12.000000
11 16.000000
12 20.000000
13 25.000000
14 30.000000
```

## 5.11 GIS 320 specific settings

### 5.11.1 Autofocus

command	answer
SGFA	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>

Example:

```
SGFA
OK
```

### 5.11.2 Focus to infinity

command	answer
SGFI	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>

Example:

```
SGFI
OK
```

### 5.11.3 Get remaining cooling time

command	answer
GCDT	[int]estimate of remaining time to cool down (in seconds)

Example:

```
GCDT
60
```

### 5.11.4 Differential gas mode

Note: Differential gas mode and High sensitivity mode can not be combined

command	1st parameter	answer
SDGM	<ul style="list-style-type: none"> <li>■ TRUE</li> <li>■ FALSE</li> </ul>	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GDGM		<ul style="list-style-type: none"> <li>■ TRUE</li> <li>■ FALSE</li> </ul>

Example:

```
SDGM TRUE
OK
GDGM
TRUE
```

### 5.11.5 High sensitivity mode

Note: Differential gas mode and High sensitivity mode can not be combined

command	1st parameter	answer
SHSM	<ul style="list-style-type: none"> <li>■ TRUE</li> <li>■ FALSE</li> </ul>	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GHSM		<ul style="list-style-type: none"> <li>■ TRUE</li> <li>■ FALSE</li> </ul>

Example:

```
SHSM TRUE
OK
GHSM
TRUE
```

### 5.12 Palettes of thermal video stream

Note: These in this section are not valid for WIRIS AGRO

Note: Only palettes returned by get palette list command (5.12.1) can be set

command	1st parameter	answer
GPTE		[int] current palette index [string]current palette name
SPTE	[string] palette name	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
SPTI	[int]palette index	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>

Example:

```
SPTE GRAY
OK
GPTE
9 GRAY
```

#### 5.12.1 Get camera palettes

command	answer
GPTL	{ [int]palette index [string]palette name }

Example:

```
GPTL
0 BLACKRED
1 BLUERED
2 BWIRON
3 BWIRONI
4 BWRAINBOW
```

#### 5.12.2 Get palette Look-up table

Color palette is a look-up table of 8-bit RGB values for 8-bit normalized one channel image (temperature intensity). It is possible to download the currently used look-up table from the camera using following command. The first line is representing the color for the hottest pixels, the last the coldest ones. There are 256 lines of the answer.

command	answer
GPLV	{ [int]R [int]G [int]B }

Example:

```
GPLV
0 0 0
2 0 2
4 0 4
...
```

## 5.13 Colourmap

Note: These commands work only for WIRIS AGRO

Note: Only palettes returned by get colourmap list command (5.13.1) can be set

command	1st parameter	answer
GCMP		[int] current palette index [string]current palette name
SCMP	[int]colourmap index	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>

Example:

```
SCMP 1
OK
GCMP
CROPSTEP_MAP
```

### 5.13.1 Get colourmap list

Get all available colourmap in list.

command	answer
GCML	{ [int]colourmap index [string]colourmap index }

Example:

```
GCML
1 CROPSTEP_MAP
2 WATER_MAP
3 WATERSTEP_MAP
```

## 5.14 Capture and record

### 5.14.1 Record and capture

The commands returns an acknowledgement right away, but the capture itself can take up to several seconds depending on the settings. Returns NOT\_READY in the case the capture cannot be initiated due to the last one not being finished yet.

command	answer
CPTR	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ NOT_READY</li> </ul>

Example:

```
CPTR
OK
```

### 5.14.2 Is capturing

command	answer
ICPT	<ul style="list-style-type: none"> <li>■ TRUE</li> <li>■ FALSE</li> </ul>

Example:

```
ICPT
FALSE
```

### 5.14.3 Recording start

Start recording thermal and visible video according to settings. The acknowledgement is returned right away, however the recording takes place until RCRF (5.14.4) is received or the memory is full. If recording is already taking place, "NOT\_READY" answer is returned.

command	answer
RCRS	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ NOT_READY</li> </ul>

Example:

RCRS
OK

#### 5.14.4 Recording finish

Stops recording of thermal and visible video. If no recording is currently running the "NOT\_READY" answer is returned.

command	answer
RCRF	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ NOT_READY</li> </ul>

Example:

RCRS
OK

#### 5.14.5 Is recording

Returns whether any video is being recorded.

command	answer
IRCR	<ul style="list-style-type: none"> <li>■ TRUE</li> <li>■ FALSE</li> </ul>

Example:

IRCR
FALSE

#### 5.14.6 Periodic image capture settings

command	1st parameter	answer
SPIC	[int]<0s-60s>period <sup>1</sup>	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GPICT		<ul style="list-style-type: none"> <li>■ OFF</li> <li>■ [int]&lt;1s-60s&gt;period</li> </ul>

<sup>1</sup> 0 denotes periodic capturing OFF

Example:

```
SPIC 0
OK
GPIC
OFF
```

#### 5.14.7 Geofencing trigger settings

command	1st parameter	answer
GGFT		<ul style="list-style-type: none"> <li>■ ON</li> <li>■ OFF</li> </ul>
SGFT	<ul style="list-style-type: none"> <li>■ ON</li> <li>■ OFF</li> </ul>	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
SBFL <sup>1</sup>	[float]<40m-400m> <sup>2</sup> maximum altitude	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GBFL <sup>1</sup>		[float]maximum altitude in meters
SEFL <sup>1</sup>	[float]<0m-400m> <sup>2</sup> minimum altitude	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GEFL <sup>1</sup>		[float]minimum altitude in meters
SCSB <sup>1</sup>	[float]<0,1m/s-10m/s>maximum capture speed	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GCSB <sup>1</sup>		[float]maximum capture speed

<sup>1</sup>Works only if geofencing trigger is ON

<sup>2</sup> minimum can not be set above maximum

Example:

```
SGFT ON
OK
SBFL 50
OK
SEFL 100
OK
SCSB 5
OK
```

## 5.15 Temperature values

### 5.15.1 Alarm mode settings

command	1st parameter	answer
SALM	<ul style="list-style-type: none"> <li>■ ABOVE</li> <li>■ BELOW</li> <li>■ BETWEEN</li> <li>■ OUTSIDE</li> <li>■ OFF</li> </ul>	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GALM		<ul style="list-style-type: none"> <li>■ ABOVE</li> <li>■ BELOW</li> <li>■ BETWEEN</li> <li>■ OUTSIDE</li> <li>■ OFF</li> </ul>

Example:

```
SALM OFF
OK
GALM
OFF
```

### 5.15.2 Alarm values settings

command	1st parameter	2nd parameter	answer
SALV	[float]Above value	[float]below value	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GALV		[float]Above value	[float]below value

Example:

```
SALV 40.0 50.0
OK
GALV
40.0 50.0
```

### 5.15.3 Alarm color settings

command	1st parameter	answer
SALC	<ul style="list-style-type: none"> <li>■ RED</li> <li>■ GREEN</li> <li>■ BLUE</li> </ul>	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GALC		<ul style="list-style-type: none"> <li>■ RED</li> <li>■ GREEN</li> <li>■ BLUE</li> </ul>

Example:

```
SALC GREEN
OK
GALC
GREEN
```

### 5.15.4 Get extremes

Return the current thermal camera extremes. The extreme consists out of value designation (MIN/MAX/CENTER), coordinates X and Y and the extreme value in set units ( $^{\circ}C$ ,  $K$ ,  $^{\circ}F$ ). Each extreme takes one line like:

```
MAXIMUM X Y VALUE
MINIMUM 300 100 10.000
CENTER 320 256 25.555
```

command	answer
GTEX	[string]image values

Note: This command works for all cameras, on Wiris Security the temperature value is not present in the answer

Example:

```
GTEX
MAXIMUM 572 90 49.575001
MINIMUM 384 193 23.650000
CENTER 320 256 25.850000
```

### 5.15.5 Get ROI temperature

Gets statistical values from rectangular region of interest (ROI) defined by its coordinates ( $x_{start}, y_{start}, x_{end}, y_{end}$ ; coordinate (0,0) is upper left corner). The result consists out of value designation (MIN/MAX/AREA AVG), coordinates

X and Y for min and max, and the temperature value.

Note: This message can be queried with maximal frequency of 3Hz

WWS does not support this message.

command	1st parameter	2nd parameter	3rd parameter	4th parameter	answer
GROT	[int]column <sup>1</sup> start	[int]line start	[int]column end	[int]line end	[string]ROI statistic

Coordinates starts from upper left corner ([0, 0]) and ends in left down corner ([width-1, height-1]) of the image.

Example:

```
GROT 0 0 200 200
AREA AVG 30.573807
MAXIMUM 0 0 31.750000
MINIMUM 10 12 29.500000
```

#### 5.15.6 Get one pixel temperature

Return the measured value of a pixel on given coordinates (coordinate (0,0) is upper left corner) in set temperature units. This message can be queried with maximal frequency of 3Hz.

WWS does not support this message.

command	1st parameter	2nd parameter	answer
GOPT	[int]column <sup>1</sup>	[int]line	[float]temperature

Coordinates starts from upper left corner ([0, 0]) and ends in left down corner ([width-1, height-1]) of the image.

Example:

```
GOPT 120 200
38.1
```

#### 5.16 Update

The update file needs to be uploaded to the camera by physically connecting memory with it (SD card), or using the FTP acces to the camera (see chapter ??).

command	answer
CUPD <sup>1</sup>	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
IUPD <sup>2</sup>	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>

<sup>1</sup>Searches for the update file, might take several minutes to answer

<sup>2</sup> only accessible if CUPD was send and returned OK on given telnet instance. Reboots the camera and install the update

Note: In case of update commands the answer is immediately followed by more information (hints) as to what is the status of the update

Example:

```
CUPD
OK: UPDATE FILE WITH THE NEWER VERSION FOUND.
IUPD
OK: Installing update.
```

## 5.17 Thermal camera parameters

Commands in this section are not valid for Wiris Security devices. Any other device-specific changes to the commands

### 5.17.1 Environment variables

command	1st parameter	answer
STEM <sup>1</sup>	[float]<0.5-1> emissivity	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GTEM <sup>1</sup>		[float]emissivity
STRT <sup>1</sup>	[float] <sup>2</sup> reflected temperature	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GTRT <sup>1</sup>		[float]reflected temperature
STAT <sup>1</sup>	[float] <sup>2</sup> atmospheric temperature	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GTAT <sup>1</sup>		[float]atmospheric temperature

<sup>1</sup> not valid for Wiris Agro

<sup>2</sup> settings is passed in set units (see 5.5), valid range is from  $-40^{\circ}\text{C}$  to  $100^{\circ}\text{C}$

Example:

```
STEM 0.6
OK
GTEM
0.600000
```

### 5.17.2 Image interpolation

command	1st parameter	answer
STII	<ul style="list-style-type: none"> <li>■ TRUE</li> <li>■ FALSE</li> </ul>	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GTII		<ul style="list-style-type: none"> <li>■ TRUE</li> <li>■ FALSE</li> </ul>

Example:

```
STII TRUE
OK
GTII
TRUE
```

### 5.17.3 Shutter

#### 5.17.4 Synchronous shutter settings

command	1st parameter	answer
STSC <sup>1</sup> <sup>2</sup>	<ul style="list-style-type: none"> <li>■ TRUE</li> <li>■ FALSE</li> </ul>	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GTSC <sup>1</sup> <sup>2</sup>		<ul style="list-style-type: none"> <li>■ TRUE</li> <li>■ FALSE</li> </ul>
STCP <sup>1</sup>	[int]<120s-1800s>shutter period (synchronous shutter)	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GTCP <sup>1</sup>		[int]camera shutter period
GTSL		[int]seconds elapsed from last shutter
GTSN <sup>1</sup>		<ul style="list-style-type: none"> <li>■ [int]seconds to next shutter (synchronous shutter)</li> <li>■ N/A (asynchronous shutter)</li> </ul>

<sup>1</sup> not valid for GIS 320

<sup>2</sup> TRUE denotes the synchronous shutter settings, FALSE asynchronous

Example:

```
STSC FALSE
OK
GTSC
FALSE
```

### 5.17.5 Perform thermal camera shutter

Performs the thermal camera shutter immediately. On GIS 320 shutter must be placed in front of the lens when sending this command for the GIS 320 camera (cap of the lens). GIS 320 does not have integrated shutter.

command	answer
IMCR	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>

Example:

```
IMCR
```

OK

### 5.17.6 Current lens

Note: Camera can be calibrated for more than one thermal lens. If so, following parameters are valid

command	1st parameter	answer
SLEN	[int]Lens index	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GLEN		[int]Lens index
GLEL		{[string] lens}

Example:

```
GLEL
640P-45D-13MM
640P-32D-19MM
OK
SLEN 0
GLEN
0
```

## 5.18 Image and video settings

Each WIRIS and GIS device only support a subset of the mentioned image formats. Please refer to your device user manual.

### 5.18.1 Images

Whether to save given image type

#### 5.18.1.1 Radiometric JPEG

command	1st parameter	answer
SIRJ	<ul style="list-style-type: none"> <li>■ TRUE</li> <li>■ FALSE</li> </ul>	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GIRJ		<ul style="list-style-type: none"> <li>■ TRUE</li> <li>■ FALSE</li> </ul>

Example:

```
SIRJ FALSE
OK
GIRJ
FALSE
```

#### 5.18.1.2 Radiometric TIFF

command	1st parameter	answer
SIRT	<ul style="list-style-type: none"> <li>■ TRUE</li> <li>■ FALSE</li> </ul>	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GIRT		<ul style="list-style-type: none"> <li>■ TRUE</li> <li>■ FALSE</li> </ul>

Example:

```
GIRT FALSE
OK
SIRT
FALSE
```

#### 5.18.1.3 CWSI TIFF

command	1st parameter	answer
SICT	<ul style="list-style-type: none"> <li>■ TRUE</li> <li>■ FALSE</li> </ul>	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GICT		<ul style="list-style-type: none"> <li>■ TRUE</li> <li>■ FALSE</li> </ul>

Example:

```
SICT FALSE
OK
GICT
FALSE
```

### 5.18.1.4 Super-resolution

command	1st parameter	answer
SISR	<ul style="list-style-type: none"> <li>■ TRUE</li> <li>■ FALSE</li> </ul>	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GISR		<ul style="list-style-type: none"> <li>■ TRUE</li> <li>■ FALSE</li> </ul>

Example:

```
SISR FALSE
OK
GISR
FALSE
```

### 5.18.1.5 Screenshot

command	1st parameter	answer
SISS	<ul style="list-style-type: none"> <li>■ TRUE</li> <li>■ FALSE</li> </ul>	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GISS		<ul style="list-style-type: none"> <li>■ TRUE</li> <li>■ FALSE</li> </ul>

Example:

```
SISS FALSE
OK
GISS
FALSE
```

### 5.18.1.6 Visible (OZ) image

Note: Resolution of image 1920 x 1080

command	1st parameter	answer
SIVI	<ul style="list-style-type: none"> <li>■ TRUE</li> <li>■ FALSE</li> </ul>	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GIVI		<ul style="list-style-type: none"> <li>■ TRUE</li> <li>■ FALSE</li> </ul>

Example:

```
SIVI FALSE
OK
GIVI
FALSE
```

### 5.18.2 Visible High Resolution image

Note: Resolution of image depends on Wiris Enterprise settings

command	1st parameter	answer
SIHR	<ul style="list-style-type: none"> <li>■ TRUE</li> <li>■ FALSE</li> </ul>	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GIHR		<ul style="list-style-type: none"> <li>■ TRUE</li> <li>■ FALSE</li> </ul>

Example:

```
SIHR FALSE
OK
GIHR
FALSE
```

### 5.18.3 Videos

#### 5.18.3.1 Radiometric video

Also known as sequence.

Note: It is not possible to record Radiometric Video and Thermal encoded video at the same time

command	1st parameter	answer
SVTH	<ul style="list-style-type: none"> <li>■ TRUE</li> <li>■ FALSE</li> </ul>	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GVTH		<ul style="list-style-type: none"> <li>■ TRUE</li> <li>■ FALSE</li> </ul>

Example:

SVHR FALSE  
OK  
GVHR  
FALSE

#### 5.18.3.2 Thermal encoded video

Note: It is not possible to record Radiometric Video and Thermal encoded video at the same time

command	1st parameter	answer
SVTH	<ul style="list-style-type: none"> <li>■ TRUE</li> <li>■ FALSE</li> </ul>	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GVTH		<ul style="list-style-type: none"> <li>■ TRUE</li> <li>■ FALSE</li> </ul>

Example:

SVHR FALSE  
OK  
GVHR  
FALSE

#### 5.18.3.3 Visible (OZ) video

Note: Resolution of video 1280x720

command	1st parameter	answer
SVVI	<ul style="list-style-type: none"> <li>■ TRUE</li> <li>■ FALSE</li> </ul>	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GVVI		<ul style="list-style-type: none"> <li>■ TRUE</li> <li>■ FALSE</li> </ul>

Example:

SVVI FALSE  
OK  
GVVI  
FALSE

#### 5.18.4 Visible High Resolution video

Note: Resolution of video depends on Wiris Enterprise settings. To settings above 4000x3000 only images are available

command	1st parameter	answer
SVHR	<ul style="list-style-type: none"> <li>■ TRUE</li> <li>■ FALSE</li> </ul>	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GVHR		<ul style="list-style-type: none"> <li>■ TRUE</li> <li>■ FALSE</li> </ul>

Example:

```
SVHR FALSE
OK
GVHR
FALSE
```

#### 5.18.5 Image location

command	1st parameter	answer
SILC	<ul style="list-style-type: none"> <li>■ SSD</li> <li>■ SD_CARD</li> <li>■ FLASH_DRIVE</li> </ul>	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GILC		<ul style="list-style-type: none"> <li>■ SSD</li> <li>■ SD_CARD</li> <li>■ FLASH_DRIVE</li> </ul>

Example:

```
SILC SSD
OK
GILC
SSD
```

#### 5.18.6 Wiris Enterprise HR camera resolution

#### 5.18.7 Get HR camera resolution

Returns the current resolution setting of the HR camera. This command only works for WWE.

command	1st parameter	answer
SHRR <sup>1</sup>	<ul style="list-style-type: none"> <li>■ 4656x3496</li> <li>■ 2320x1744</li> <li>■ 1920x1080</li> </ul>	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GHRR		<ul style="list-style-type: none"> <li>■ 4656x3496@10</li> <li>■ 2320x1744@30</li> <li>■ 1920x1080@30</li> </ul>

<sup>1</sup> sets the resolution and reboots the device

Example:

```
SHRR 2320x1744
OK
GHRR
2320x1744@30
```

## 5.19 Laser rangefinder

Laser Range Finder is on demand option on Wiris Enterprise. These commands work only for certain models of WWE.

### 5.19.1 Show position on HDMI

command	1st parameter	answer
SLRF	<ul style="list-style-type: none"> <li>■ TRUE</li> <li>■ FALSE</li> </ul>	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GLRF		<ul style="list-style-type: none"> <li>■ TRUE</li> <li>■ FALSE</li> </ul>

Example:

```
SLRF TRUE
OK
GLRF
TRUE
```

## 5.20 Date and time

command	1st parameter	2nd parameter	answer
SDTI	[string]yyyy/MM/dd-hh:mm:ss		<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GDTI			[string]yyyy/MM/dd-hh:mm:ss
STUS <sup>1</sup>	[int]seconds since epoch <sup>2</sup>	[int]microseconds 1st parameter	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>

<sup>1</sup>Not saved across reboots

<sup>2</sup>1.1.1970 00:00

Example:

```
SDTI 2023/06/5 – 14:52:35
OK
GDTI
2023/06/5 – 14:52:38
```

## 5.21 Memory

There are three types of memory: SSD, SD\_CARD or FLASH\_DRIVE.

### 5.21.1 Memory status

The following commands returns the status of each memory on one line like:

SSD SOME\_STATUS

SD\_CARD SOME\_STATUS

FLASH\_DRIVE SOME\_STATUS

command	answer
GMST	<ul style="list-style-type: none"> <li>■ READY</li> <li>■ CONNECTED</li> <li>■ N/A</li> </ul>
GMSI	<ul style="list-style-type: none"> <li>■ [int]size in bytes</li> <li>■ N/A</li> </ul>
GMFR	<ul style="list-style-type: none"> <li>■ [float] percent free</li> <li>■ N/A</li> </ul>
GMCP	[int]captured images

Example:

```
GMSI
SSD 251599224832
FLASH_DRIVE N/A
SD_CARD 31784960000
GMCP
SSD 22
FLASH_DRIVE 0
SD_CARD 0
GMSI
```

#### 5.21.1.1 Recorded video

Video can only be saved into the internal (SSD) memory. These commands returns only the integer.

command	answer
GTRC	[int]seconds of thermal video
GMCP	[int]seconds of visible video

Example:

```
GTRC
689
GVRC
38
```

#### 5.21.2 Get saving time

Return the current estimated saving time in seconds.

Note: Saving time is affected by chosen memory for images and chosen formats to be saved.

command	answer
GEST	[float]seconds of estimate saving duration

Example:

```
GEST
1.2
```

### 5.21.3 Data transfer

#### 5.21.4 Copy data

Copy all data from SSD to other memory, either SD card, or USB flash disk. This operation can take a lot of time (up to hours in case of full SSD disk). Thus this command has two parts. Firstly, start the copying. Then periodically check the status. Please check that the memory has enough space, otherwise the ERROR answer is returned.

command	1st parameter	answer
CPST	<ul style="list-style-type: none"> <li>■ SD_CARD</li> <li>■ FLASH_DRIVE</li> </ul>	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> <li>■ N/A</li> </ul>
CPSS		<ul style="list-style-type: none"> <li>■ OK</li> <li>■ [int] progress percent</li> <li>■ ERR</li> </ul>

Example:

```
CPST FLASH_DRIVE
OK
CPSS
40
CPSS 60
CPSS
OK
```

## 5.22 Stream

### 5.22.1 Get thermal camera resolution

command	answer
GTRE	[int]width [int]height

Example:

```
GTRE
640 512
```

### 5.22.2 Encoder parameters settings

Note: The encoder settings will affect both recorded encoded videos and the RTSP streams

Note: it is not possible to change the encoder settings when encoded video is being saved. RTSP stream will be paused in order to change the settings, if running.

command	1st parameter	2nd parameter	answer
SEBR	<ul style="list-style-type: none"> <li>■ THERMO</li> <li>■ VISIBLE</li> </ul>	[int]<0-2 <sup>32</sup> – 1>encoder bitrate <sup>1</sup>	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GEBR	<ul style="list-style-type: none"> <li>■ THERMO</li> <li>■ VISIBLE</li> </ul>		[int]encoder bitrate <sup>1</sup>
SEGS	<ul style="list-style-type: none"> <li>■ THERMO</li> <li>■ VISIBLE</li> </ul>	[int]<0-32767>GOP size	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GEGS	<ul style="list-style-type: none"> <li>■ THERMO</li> <li>■ VISIBLE</li> </ul>		[int]GOP size
SEIR	<ul style="list-style-type: none"> <li>■ THERMO</li> <li>■ VISIBLE</li> </ul>	[int]<0-2 <sup>32</sup> – 1>IDR interval	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GEIR	<ul style="list-style-type: none"> <li>■ THERMO</li> <li>■ VISIBLE</li> </ul>		[int]IDR interval
SEQZ	<ul style="list-style-type: none"> <li>■ THERMO</li> <li>■ VISIBLE</li> </ul>	[int]<0-51> quantization quality parameter <sup>2</sup>	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GEOZ	<ul style="list-style-type: none"> <li>■ THERMO</li> <li>■ VISIBLE</li> </ul>		[int] quantization quality parameter

Table 5.1 – <sup>1</sup>0 = no bitrate control; constant quality mode is used

<sup>2</sup>ignored if bitrate set to non-zero value

Example:

```
SEBR VISIBLE 0
OK
GEBR VISIBLE
0
```

## 5.23 Trigger

command	1st parameter	answer
STRG	<ul style="list-style-type: none"> <li>■ CORRECTION</li> <li>■ CAPTURE</li> <li>■ RECORD</li> <li>■ NA</li> </ul>	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
GTRG		<ul style="list-style-type: none"> <li>■ CORRECTION</li> <li>■ CAPTURE</li> <li>■ RECORD</li> <li>■ NA</li> </ul>

Example:

```
STRG RECORD
OK
GTRG
RECORD
```

## 5.24 System

### 5.24.1 Default settings

Set the default settings, can take up to 10 seconds. This command will exit the Ethernet Mode and changes the IP..

command	answer
SDST	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>

Example:

```
SDST
OK
```

### 5.24.2 Shut down

command	answer
SHDW	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>

Example:

```
SHDW
OK
```

### 5.24.3 Reboot

command	answer
REBT	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>

Example:

```
REBT
OK
```

## 5.25 System

### 5.25.1 IP

Note: IP settings is changed and TELNET control disconnected as result

command	1st parameter	answer
STIP	[string]IPv4	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>
STMS	[string]IPv4 mask	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>

Example:

```
STIP 10.0.0.230
OK
```

### 5.25.2 Default settings

Set the default settings, can take up to 10 seconds. This command will exit the Ethernet Mode and changes the IP..

command	answer
SDST	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>

Example:

```
SDST
OK
```

### 5.25.3 Shut down

command	answer
SHDW	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>

Example:

```
SHDW
OK
```

### 5.25.4 Reboot

command	answer
REBT	<ul style="list-style-type: none"> <li>■ OK</li> <li>■ ERR</li> </ul>

Example:

```
REBT
OK
```



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