



IMPAC Pyrometers

IS 6-TV Advanced • IGA 6-TV Advanced • IGA 6/23-TV Advanced
ISR 6-TV Advanced • IGAR 6-TV Advanced



MANUAL

*Addendum to IS 6 Advanced, IGA 6 Advanced, IGA 6/23 Advanced,
ISR 6 Advanced and IGAR 6 Advanced Manuals*

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2 Introduction

2.1 Technical Data

(Different from IS 6 Advanced, IGA 6 Advanced, IGA 6/23 Advanced, ISR 6 Advanced, or IGAR 6 Advanced)

Video-Signal:	FBAS-Signal ca. 1 VSS at 75 Ohms, PAL (B), 50 Hz, CCIR656 video output galvanically isolated from power supply, analog output and digital interface
Date/Time:	Real time clock with about 14 days buffer (GoldCap)
Connection of Video-Signal:	Separate triaxial socket to support double shielded signal transmission (at pyrometer) BNC connector (on user side - BNC-RCA adapter included) Video signal can be switched off via software
Operating ambient temperature:	0 to 60 °C on the housing



Note: During operation the instruments will warm up and might reach an intrinsic temperature of up to 58 °C.

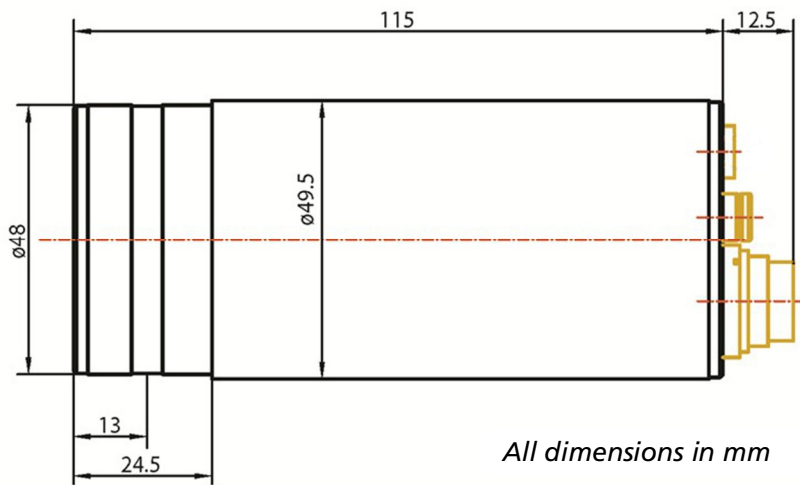
Optics

Superimposed text elements:	Circular target marker, user text, time, date, measured temperature Additional: device temperature or distance or serial no. or intensity (only ISR)
Field of view:	approx. 11.6% x 8.4% of the adjusted measuring distance
Resolution:	768 x 576 Pixel video chip 768 x 520 Pixel displayed on screen
Brightness control:	Automatic or manual (via software)



Note: The calibration / adjustment of this pyrometer is carried out in accordance with VDI/VDE 3511, Part 4.4. See <http://info.lumasenseinc.com/calibration> for more information.

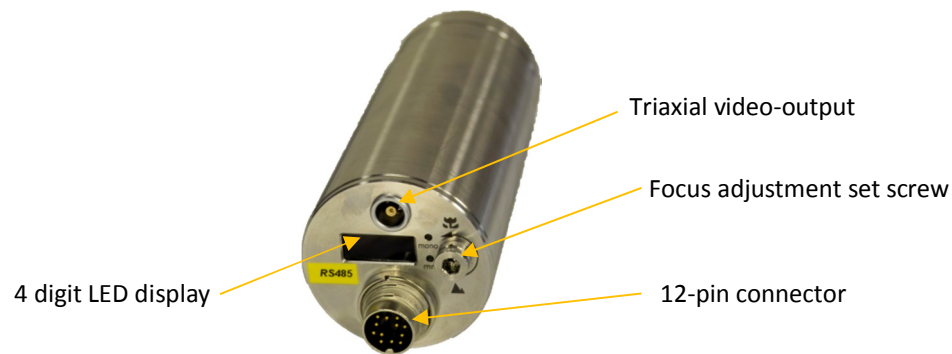
2.2 Dimensions



3 Electrical Installation

3.1 Video Output Electrical Connection

On the back cover of Series 6-TV Advanced pyrometers, there is an additional coaxial connector for the video output. LumaSense offers ready-made video connection cables in various lengths, which are fitted with a BNC connector and a BNC-RCA adapter to connect to a monitor or video grabber.

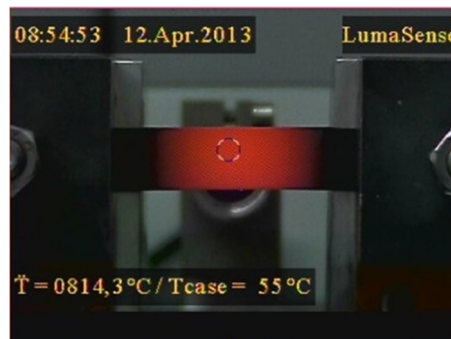


Rear View of the Pyrometer

3.1.1 Video Image

The video image is used for aligning the pyrometer to the measuring object and shows the following information:

- The measuring object and its surroundings
- Target marking circle (The size of the circle corresponds to the measuring target size)
- Current temperature reading
- In addition to the measuring temperature, one of the following parameters is displayed:
 - Internal temperature of the pyrometer (Tcase)
 - Measuring distance (a = xxxxx)
 - Serial number (SNo: xxx)
 - Signal intensity (I = xxx.x% only ISR 6-TV Advanced and IGAR 6-TV Advanced)
- Current Time and Date
- User text (e.g. "LumaSense")

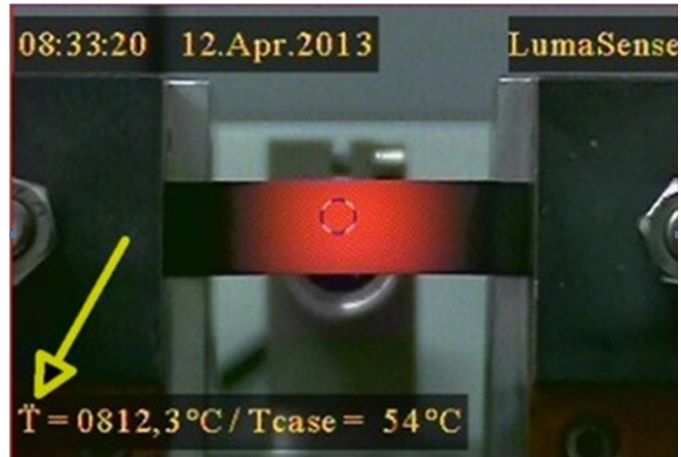


Example of a video image

Operating Mode

The two dots above the letter "T" show the selected operating mode (ISR 6-TV Advanced and IGAR 6-TV Advanced only).

- 2-channel mode: 2 dots displayed. If the signal falls below the set Relative Signal (see "Relative Signal" in ISR 6 Advanced or IGAR 6 Advanced Manual), the temperature displayed on the image will be flashing.
- 1-channel mode: only the left dot is displayed.
- Metal mode: the left dot is displayed continuously, the right dot flashes.
- Smart-Mode (IGAR 6-TV Advanced only): both dots flash.

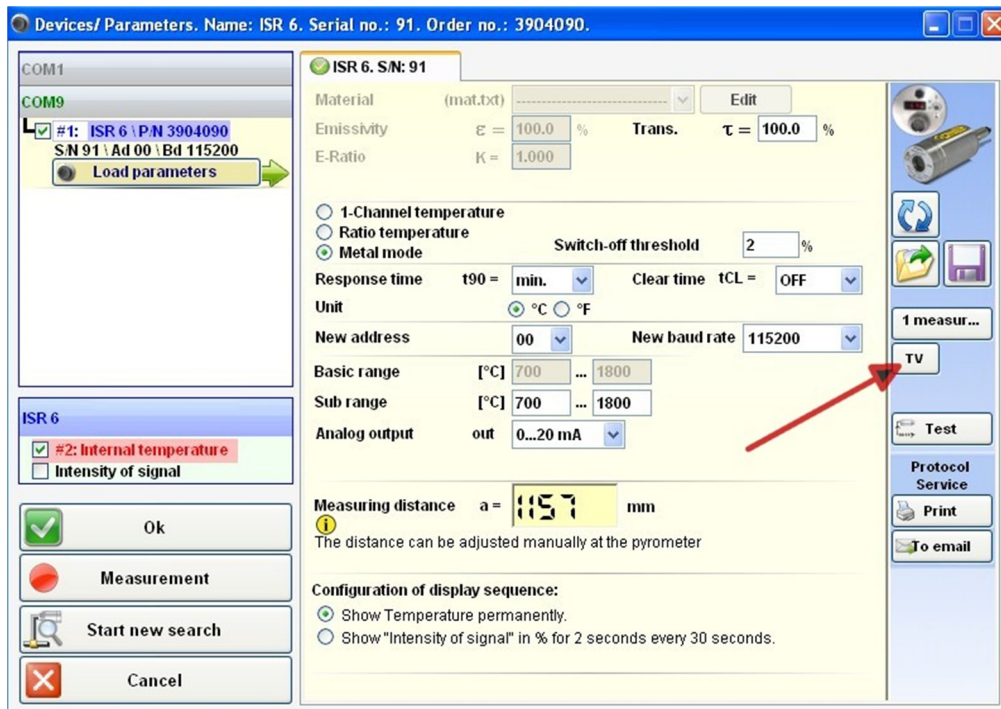


4 Software InfraWin

You can configure the video image and display options using a PC and the InfraWin 5 software (included in scope of delivery).

4.1 Set Video Mode Parameters

1. Choose **TV** for setting the parameters of the video module.



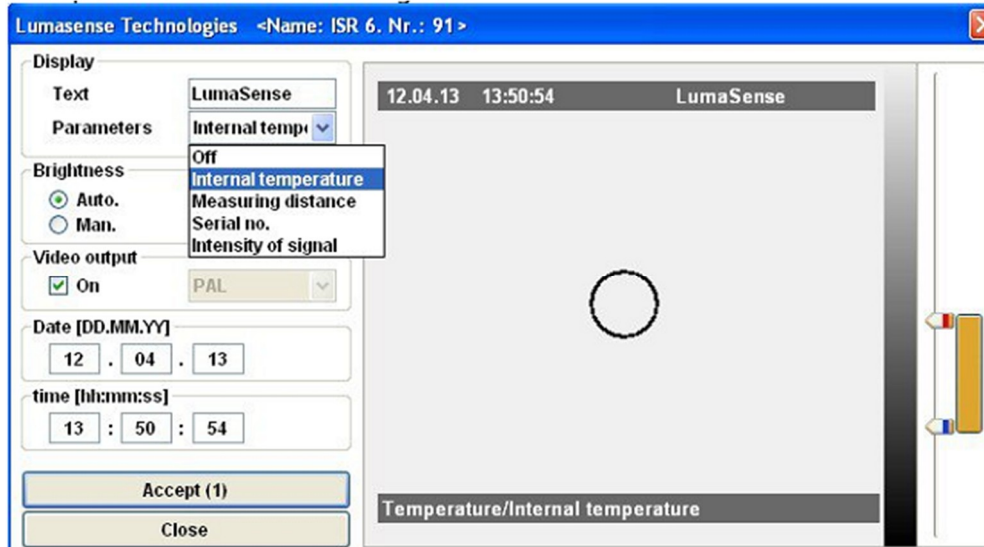
2. Complete the following fields on the screen:
 - **Text:** Enter user text (e.g. "LumaSense")
 - **Parameters:** Display in addition to measuring temperature
 - Off (no parameter is displayed)
 - Device temperature
 - Measuring distance
 - Serial number
 - Signal intensity (ISR 6-TV Advanced and IGAR 6-TV Advanced only)
 - **Brightness:** Selects the brightness adjustment mode of the video image: automatic or manual
 - **Video Output:** To turn on/off the video output (high impedance=off)
 - **Date and Time Settings:** Set the current time and date
3. Click the **Accept** button to save the settings.

4.2 Adjusting Brightness

You can set the brightness control to Manual (Man.) or Automatic (Auto) using the InfraWin 5 software.

- **Manual** - the brightness of the video image can be set manually using the slider at the right side of the video image.
- **Automatic** - the brightness of the video image is automatically controlled. Using the two sliders (red and blue) at the right side of the video image, a range of brightness can be set where the automatic control should work. With the yellow button, the selected range can be moved.

If the circle (representing the current brightness) is within the chosen range, automatic brightness control is not active. Once the circle is outside of the chosen range, automatic brightness control activates and automatically adjusts the brightness until the circle returns to the chosen range.

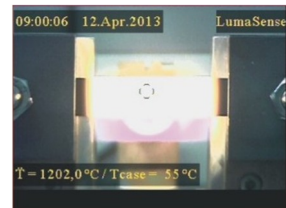
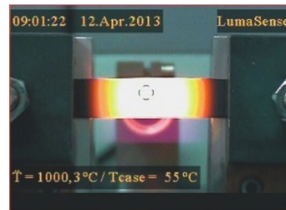
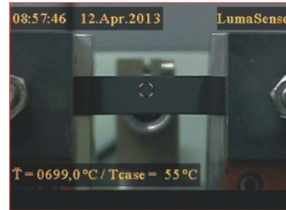


These settings affect the video chip in the pyrometer. By pressing the **Accept** button, the settings are stored in the pyrometer.

Comparison between manual and automatic control of brightness:

The measuring temperature was changed for the image recording from the beginning of the measuring range to 1200 °C.

Manual brightness control



Automatic brightness control



5 Accessory (optional)

5.1 Video Grabber (Converts Analog TV to USB)

Using the video grabber (optional accessory) in conjunction with the software InfraWin 5, it is possible to see the video image on the PC screen together with the temperature graph.

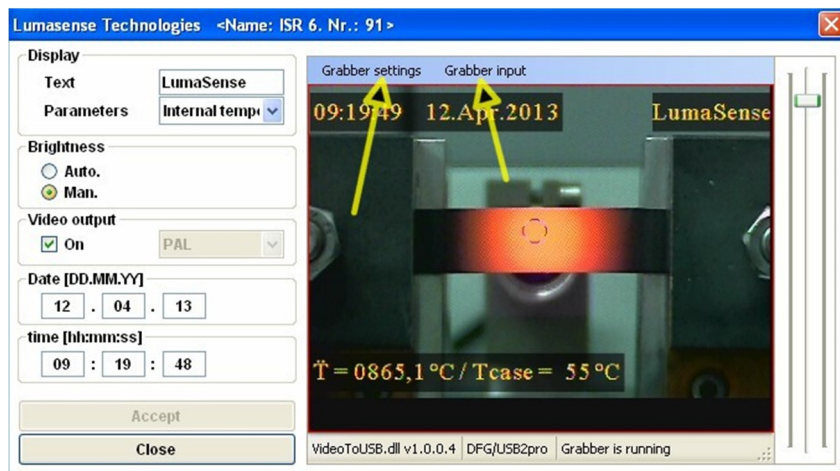
The video image can be size adjusted and positioned at any place of the screen. The properties of the pyro's video chip as well as properties of the video grabber can be adjusted with InfraWin 5.



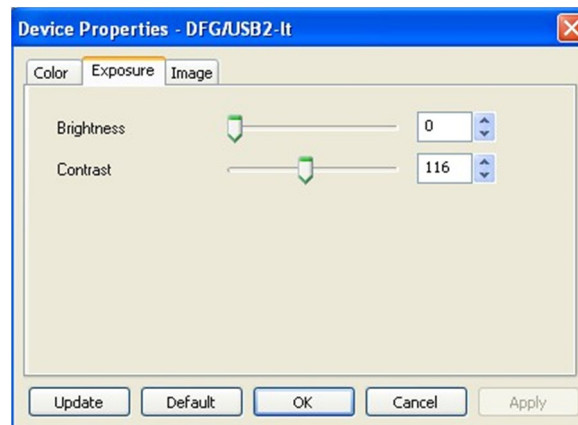
5.1.1 Adjusting Grabber Settings

On top of the video image there is a menu labeled **Grabber settings**. Set the properties of the video image by changing the parameters of the video grabber (works like the controlling knobs of a monitor).

1. Select **Grabber settings**.



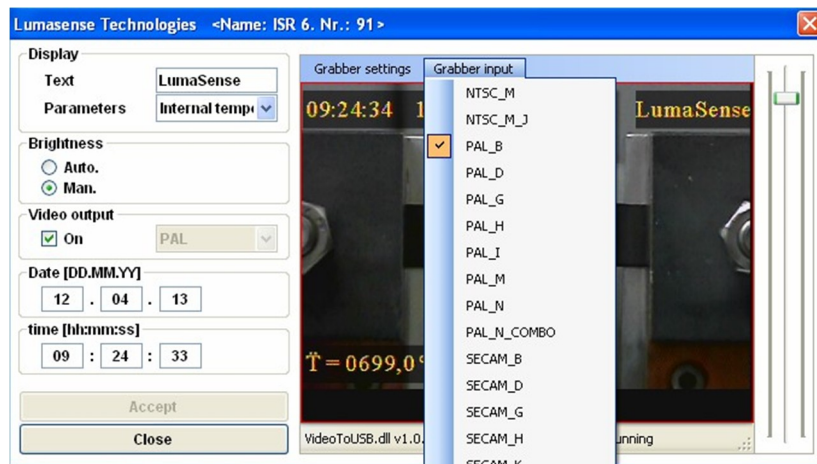
2. Configure the desired settings.



3. Save the configured settings by pressing **OK**.

5.1.2 Adjusting Video Output Settings

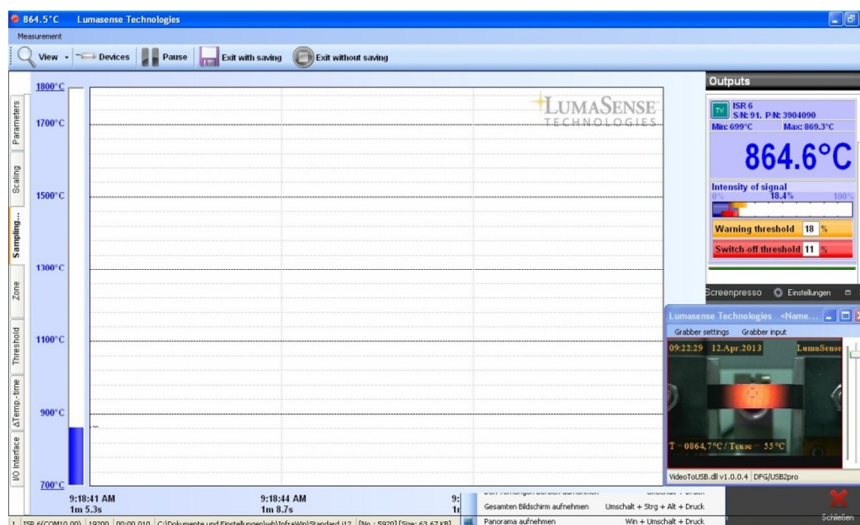
1. Select **Grabber input**.
2. Currently, only **"PAL_B"** is supported.



5.1.3 Viewing the Video Image

During a temperature measurement of the pyrometer, the video image can be displayed on the screen by pressing the **TV** button.

The video image can be positioned anywhere on the screen. Use the slider to change the brightness of the image during the measurement.



6 Data format Universal Pyrometer Protocol (UPP): Extended for Video Module

Software commands can be exchanged directly with the pyrometer through an interface using suitable communication software or by using the **Test** function located in the **Pyrometer Parameters** window of the InfraWin software package.

The data exchange occurs in ASCII format with the following transmission parameters:

- The data format is: 8 data bits, 1 stop bit, even parity (8,1,e) no handshake;
- The device responds to the entry of a command with output (such as the measuring value) + CR (Carriage Return, ASCII 13), to pure entry commands with **ok + CR**, or **no + CR**.
- Every command starts with the 2-digit device address AA (e. g. "00"). This is followed by 1 lower case command letter and 2 numbers finished with CR.

Example Read Command: Entry: "00v08" + <CR>

Selectable parameter that is additionally shown to the measuring temperature

Read selection: Answer: 2-digit, hex

e.g. "02" + <CR> The measured distance is displayed in addition to temperature.

- The ASCII parameter "X" indicates a change to be made in a parameter. When used, the command contains the new value.

Example Write Command: Entry: "00v08XX " + CR

The case temperature is additionally shown to the measuring temperature. A „?" after the read command answers with the limits of the respective settings (only a setting command, not a query command).

- A "?" after the lower case command letters answers with the limits of the respective settings (only at setting commands, not at query commands).

Example Read Limits Command: Entry: "00v08?" + CR!

The answer is "00FF" + <CR>

Description	Command	Parameters
v00	v00XX	Text fade in, set value. XX=00..1F,hex Bit[0]: Overlay_0 -> parameter display (0: fade out; 1: fade in) Bit[1]: Overlay_1 -> Time/Date (0: fade out; 1: fade in) Bit[2]: Overlay_2 -> User-Text (0: fade out; 1: fade in) Bit[3]: Overlay_3 -> target circle (0: fade out; 1: fade in) Bit[4]: Firmware-Block Overlay-activation (0: Off →all ovl's off, resolution=768x576; 1: On →ovl's corresponding to Bit[3:0] Settings on and resolution=768x520)
v01	v01	Pixel Coordinates of top left corner of temperature display read. (Overlay_0) Answer = XXXYYY (6-digit, hex) XXX: X-Coordinate YYY: Y-Coordinate (000 = top)
	v01XXXXYY	Set Coordinates of temperature display. XXX: 000..300hex (X-Coordinate) YYY: 000..208hex (Y-Coordinate→Change only in multiples of 2)
	v01?	Coordinates of temperature display read limits. Answer: 000300000208 (PAL) Format xxxXXXyyyYYY xxx min X-Value, XXX max X-Value yyy min Y-Value, YYY max Y-Value
v02		description see „v01“ but Coordinates of time/Date (Overlay_1)
v03		description see „v01“ but Coordinates of UserText (Overlay_2)
v05	v05	store v01,v02,v03,v04 in flash memory
v06	v06	UserText read. Answer: ASCII-String
	v06nnS	UserText write. nn: 01..32hex (number of characters) S: ASCII-String (nn characters long)
	v06?	UserText read limit. Answer: 0132xy x: first character is blank (0x20) y: last character is 'ÿ' (0xff)
v07	v07	Store user-text in flash memory
v08	v08	Selectable parameter, selection read. Answer: 2-digit, hex
	v08XX	Selectable parameter, selection write. XX={00,01,80} 00: case temperature 02: measuring distance 03: Ser-No 80: Intensity (ISR 6-TV Advanced and IGAR 6-TV Advanced only); FF: no parameter
	v08?	Selectable parameter, read limits. Answer: 00FF
v09	v09	Selectable parameter, store selection in flash memory

Description	Command	Parameters
v10	v10	Text properties parameter, read. Answer 4-digit, hex.
	v10ABCD	Text properties parameter, write. A: text color (0..F) B: text transparency (0..7 → 0: transparent; 7: full opacity) C: background color (0..F) D: background transparency (0..7) <i>Color palette:</i> 0=black; 1=DarkRed; 2=Red; 3=Pink; 4=Teal; 5=Green; 6=BrightGreen; 7=Turquoise; 8=DarkBlue; 9=Violet; A=Blue; B=Grey 25%; C=Grey 50%; D=DarkYellow; E=Yellow; F=White <i>In cross faded colors →reduce opacity!!! (e.g. Yellow)</i>
	v10?	Text-properties parameter, read limits. Answer: 0F070F07
v11	v11 v11ABCD v11?	Text properties (date/time) description see „v10“
v12	v12 v12ABCD v12?	Text properties (User Text) description see „v10“
v13	v13 v13ABCD v13?	reserved (Overlay_3 used for pictures → LumasenseLogo, circle marker, AVG_rectangle) description see „v10“ however Text properties (Overlay_3)
v14	v14	store v10,v11,v12,v13 text properties in flash memory
v18	v18	Brightness control, settings read. Answer: 1-digit, hex.
	v18X	Brightness control, settings write. X=0..1 0: manual brightness control 1: automatic brightness control
	v18?	Brightness control, read limits. Answer: 01
v19	v19	Brightness, read. Answer: 3-digit, hex.
	v19XXX	Brightness, write. XXX=000..1A5
	v19?	Brightness, read limits. Answer: 0001A5
v20	v20	Brightness, store in flash memory.
v21	v21	AVG-Rectangle, properties read. Answer: AAABBBCCDDDD (12-digit, hex)
	v21 AAABBBCCDDDD	AVG-Rectangle, properties write. AAA: width (004..300hex) BBB: high (008..208hex → Change only in multiples of 2) CCC: X-Coordinate (000..2FChex) DDD: Y-Coordinate (000..200hex → Change only in multiples of 2) <ul style="list-style-type: none"> • <i>Coordinates-reference : corner top left</i> • <i>If AAA+CCC > 768 , Answer „no“</i> • <i>if BBB+DDD > 520 , Answer „no“</i>
	v21?	AVG-Rectangle, read limits. Answer: 0043000082080002FC000200
v22	v22	AVG-Rectangle, set to position and size of circle marker.
v23	v23	AVG-Rectangle, store in flash memory.

Description	Command	Parameters
v24	v24	Control limit, for automatic brightness read. Answer: XYY (4-digit, hex)
	v24XXYY	Control limit, for automatic brightness write. XX: bottom Control limit (00..FFhex) YY: top Control limit (00..FFhex) brightness of the image is changed by the OV7960 till the average value of the brightness, all pixels within the defined AVG rectangle, is in these control limits)
	v24?	Control limit, read limits. Answer: 00FF00FF
v25	v25	Control limit, store selection in flash memory
v26	v26	Time, read. Answer 6-digit, decimal
	v26hhmmss	Time, write. hh: hour (00..23) mm: minute (00..59) ss: second (00..59)
	v26?	Time, read limit. Answer: 002300590059
v27	v27	Date, read. Answer 6-digit, decimal
	v27DDMMYY	Date, write. DD: day (01..31) MM: month (01..12) YY: year (00..99)
	v27?	Date, read limits. Answer: 013101120099
v31	v31	Video-Out-Tristate read. Answer 1-digit, hex.
	v31x	Video-Out-Tristate write. x = 0..1 0: Disable 1: Enable
	v31?	Video-Out-Tristate, read limits Answer: 01
v32	v32	Video-Out-Tristate, store selection in flash memory

7 Reference Numbers

7.1 Reference numbers instrument

Type	Temperature Range	Reference Number
IS 6-TV Advanced (PAL / RS485)	600 to 1800 °C (MB 18)	3 914 570
	600 to 3000 °C (MB 30)	3 914 530
IGA 6-TV Advanced (PAL / RS485)	250 to 1800 °C (MB 18)	3 914 070
	250 to 2500 °C (MB 25)	3 914 030
IGA 6/23-TV Advanced (PAL / RS485)	50 to 1000 °C (MB 10)	3 914 230
	75 to 1300 °C (MB 13)	3 914 270
	150 to 1800 °C (MB 18)	3 914 310
ISR 6-TV Advanced (PAL / RS485)	600 to 1400 °C (MB 14)	3 904 030
	700 to 1800 °C (MB 18)	3 904 090
	800 to 2500 °C (MB 25)	3 904 160
	1000 to 3000 °C (MB 30)	3 904 230
IGAR 6-TV Advanced (PAL / RS495)	100 to 2000 °C (MB 20)	3 914 720

Ordering note: Connection and video cables are not included in scope of delivery and must be ordered separately.

7.2 Reference numbers accessories (video related)

- 3 920 600 Video cable BNC, 5 m long
- 3 920 610 Video cable BNC, 10 m long
- 3 920 620 Video cable BNC, 15 m long
- 3 920 630 Video cable BNC, 20 m long
- 3 920 640 Video cable BNC, 25 m long
- 3 920 650 Video cable BNC, 30 m long
- 3 920 660 Video cable BNC, 40 m long
- 3 920 670 Video cable BNC, 45 m long
- 3 920 680 Video cable BNC, 60 m long
- 3 920 690 Video cable BNC, 100 m long

All video cables include an adapter BNC-socket to RCA male (CINCH)

- 3 826 740 Passive Video Baluns with BNC connectors for transmitting video signals over standard inexpensive patch cable (eg CAT5 cable). Maximum cable length: 300 m with color video.

- 3 826 730 Video grabber (converts analog TV to USB)

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