LEADER

LE 8682

VIDEO MEASURING BOX

INSTRUCTION MANUAL

LEADER
ELECTRONIC MEASURING INSTRUMENTS

TABLE OF CONTENTS

GENERAL SAFETY SUMMARY

■ Read This before Using the Instrument

This instrument should only be used by persons with sufficient knowledge of electronics who thoroughly understand the contents of this manual.

This instrument is not designed or manufactured for households or ordinary consumers.
If unqualified personnel are to use the instrument, be sure the instrument is handled under the supervision of qualified personnel (those who have electrical knowledge). This is to prevent the possibility of personal injury or damage to the instrument.

■ Note about Reading This Manual

The contents of this manual contain specialized terminology and may be difficult to understand. If you have any questions about the contents of this manual, please contact your local LEADER agent.

■ Symbols and Terms

The following symbols and terms are used in this instruction manual and on the instrument to indicate important warnings and notes.

<Symbol> ⚠	This symbol appears in this instruction manual and on the instrument to indicate an area where improper handling could result in personal injury, damage to the instrument, or malfunction of the instrument or devices connected to it. When you encounter this symbol on the instrument, be sure to refer to the information in this instruction manual that corresponds to the area that the symbol marks.
<Term> ⚠ WARNING	Ignoring the precautions that this term indicates could lead to death or serious injury.
<Term> ⚠ CAUTION	Ignoring the precautions that this term indicates could lead to personal injury or damage to the instrument.

GENERAL SAFETY SUMMARY

Read the warnings and information below thoroughly to avoid death, personal injury, and damage and deterioration of the instrument.

 WARNING

■ Warnings Concerning the Case and Panels

Do not remove the instrument's case or panels for any reason. Touching the internal components of the instrument could lead to fire or electric shock.
Also, do not allow foreign materials, such as liquids, combustible matter, and metal, to enter the instrument. Turning the instrument on when such materials are inside it could lead to fire, electric shock, damage to the instrument, or some other accident.

■ Installation Environment

• Operating Temperature Range
Use this instrument in a 0 to 40 °C environment. Using the instrument with its vents blocked or in a high temperature environment could lead to fire.
Drastic changes in temperature, such as might be caused by moving the instrument between two rooms with different temperatures, can damage the instrument by causing condensation to form within it. If there is a possibility that the instrument has condensation within it, wait for approximately 30 minutes before turning on the power.

• Operating Humidity Range
Use this instrument in an environment whose relative humidity is 85 %RH or less where there is no threat of condensation forming.
Also, do not operate this instrument with wet hands. Doing so could lead to electric shock or fire.

• Do Not Operate in an Explosive Atmosphere
Using this instrument in an environment where flammable gasses, explosive gasses, or steam is emitted or stored could lead to an explosion or fire. Do not use the instrument in such an environment.

• Do Not Insert Foreign Materials
Do not insert foreign materials, such as metal and flammable objects, through the vents or allow liquid to enter the instrument. Such acts can lead to fire, electric shock, damage to the instrument, or some other accident.

■ If You Notice Something Wrong during Operation

If you notice smoke, fire, a strange smell, or something else that is wrong with the instrument while you are operating it, stop operation immediately. Failing to do so could lead to fire. Turn OFF the power switch, and remove the power cord from the outlet. After making sure that fire has not spread anywhere, contact your local LEADER agent.

GENERAL SAFETY SUMMARY

⚠ WARNING

■ Warnings Concerning the Power Source

Do not use a power source with a voltage other than the rated power source voltage for the instrument. Doing so could lead to fire.
Confirm the voltage of the power source before you connect the power cord to it.
Only use a power source whose frequency is 50/60 Hz.

Use a power cord that is appropriate for the voltage of the power source. Also, use a power cord that meets the safety standards of the country that you are using it in.
Using a power cord that does not meet the standards could lead to fire. If the power cord is damaged, stop using it, and contact your local LEADER agent. Using a damaged power cord could lead to electrical shock or fire.
When removing the plug from the power outlet, do not pull on the cord. Pull from the plug.

■ Warnings Concerning Grounding

The instrument has a ground terminal to protect the user and the instrument from electric shock. Ensure that the product is properly grounded for safe operation.

⚠ CAUTION

■ Cautions Concerning the Input and Output Connectors

To avoid damaging the instrument, only apply signals to the input connectors that conform to the specifications in this instruction manual. Do not short or apply external voltage to the output connectors.
Doing so could damage the instrument.

■ Cautions Concerning the AC Adapter

Only use the specified type of AC adapter. Using a non-specified type of adapter could damage the instrument and lead to fire.
We recommend you replace the AC adapter at least once every five years.

■ If You Will Not Use the Instrument for an Extended Period of Time

If you will not use the instrument for an extended period of time, remove the power plug from the outlet.

GENERAL SAFETY SUMMARY

■ Calibration and Repairs

This instrument has been carefully examined at the factory to ensure that its performance is in accordance with the standards. However, because of factors such as parts wearing out over time, the performance of the instrument may degrade. To ensure stable performance, we recommend that you have the instrument calibrated regularly. Also, if the instrument malfunctions, repairs are necessary. For repairs and calibration, contact your local LEADER agent.

■ Routine Maintenance

When you clean the instrument, remove the power plug from the outlet.
Do not use thinner or benzene when you clean the instrument's case, panels, or knobs. Doing so could lead to paint chipping and the corrosion of plastic components. To clean the case, panels, and knobs, use a soft cloth with mild detergent, and wipe gently. While cleaning, make sure that foreign materials, such as water and detergent, do not enter the product. If liquid or a metal object enters into the instrument, fire or electric shock may result.

■ About the European WEEE Directive

This instrument and its accessories are subject to the European WEEE Directive.
Follow the applicable regulations of your country or region when discarding this instrument or its accessories. Follow the EU Battery Directive when discarding the batteries that you removed from this instrument.
(WEEE stands for Waste Electrical and Electronic Equipment.)

Follow the warnings and precautions that have been listed in this section to use the instrument correctly and safely. Precautions are also contained in various other sections of this instruction manual. To use the instrument correctly, be sure to follow those precautions as well.

If you have any questions or comments about this instruction manual, please contact your local LEADER agent.

1. INTRODUCTION

Thank you for purchasing this LEADER instrument. To use this instrument safely, read this instruction manual thoroughly, and make sure that you know how to use the instrument properly.

If some point about the operation of this instrument is still unclear after you have read this instruction manual, refer to the contact information on the back cover of the manual to contact LEADER, or contact your local LEADER agent.
After you have finished reading this manual, keep it in a convenient place so that you can refer to it when necessary.

1.1 Scope of Warranty

This LEADER instrument has been manufactured under the strictest quality control guidelines.
LEADER shall not be obligated to furnish the following free services during the warranty period.

1. Repair of malfunction or damages resulting from fire, natural calamity, or improper voltage applied by the user.
2. Repair of a product that has been improperly repaired, adjusted, or modified by personnel other than a factory-trained LEADER representative.
3. Repair of malfunctions or damages resulting from improper use.
4. Repair of malfunctions caused by devices other than this instrument.
5. Repair of malfunctions or damages without the presentation of a proof of purchase or receipt bill for the instrument.

1.2   Operating Precautions

1.2.1   Maximum Allowable Input Voltage

⚠ CAUTION

The maximum signal voltage that can be applied to the input connectors is indicated below. Do not apply excessive voltage to the connectors. Doing so may damage the device or lead to injury.

Input Connector	Maximum Allowable Input Voltage
INPUT	±5 V (DC + peak AC)

1.2.2   Mechanical Shock

This instrument contains sensitive components, so it may be damaged if it is dropped or otherwise exposed to a strong shock.

1.2.3   Electrostatic Damage

Electronic components can be damaged by static discharge. Static electricity can build up in the core wire of a coaxial cable. Before connecting a coaxial cable to the instrument, short the core wire of the cable with the external conductor.

1.2.4   Warming Up

To ensure more accurate measurements, turn ON the instrument approximately 30 minutes before you intend to use it to allow its internal temperature to stabilize.

1.3   Trademark Acknowledgments

The company and product names in this document are trademarks or registered trademarks of their respective holders.

2. SPECIFICATIONS

2.1 General

The LE 8682 can take waveform measurements of NTSC/PAL composite video signals. The measured values can be retrieved using an application installed on a PC or using remote commands.

2.2 Features

● **Measurement of NTSC or PAL composite video signals**

The LE 8682 can measure the burst level, burst frequency, and so on of NTSC or PAL composite video signals.

● **Automatic self check**

The LE 8682 has a feature for calibrating its own measurement levels in the waveform measurement section.

2.3 Specifications

2.3.1 Waveform Input

Input Signal	NTSC or PAL composite video signal
Input Connector	1 BNC connector
Input Impedance	75 Ω
Maximum Input Voltage	±5 V (DC + peak AC)
Maximum Measurement Input Voltage	
	±3 V (DC + peak AC)
Number of Ranges	3
Measurement Range	
Range 1	±3 V (DC + peak AC)
Range 2	±1.5 V (DC + peak AC)
Range 3	±0.75 V (DC + peak AC)
Voltage Measurement Accuracy	
Range 1	
340 mV to 3 V or 340 mVp-p to 6 Vp-p	
	±3 %
≤340 mV or ≤340 mVp-p	±10 mV
Ranges 2 and 3	
170 mV to 1.5 V or 170 mVp-p to 3 Vp-p	
	±3 %
≤170 mV or ≤170 mVp-p	±5 mV
Frequency Measurement Accuracy	
	±0.1 % (25±5 °C)
A/D Converter	12 bit, 60 MHz sampling

2.3.2 Waveform Output

Output Format

Range 1	Outputs half the input signal
Range 2	Active through output
Range 3	Active through output
Output Connectors	2 BNC connectors
Output Impedance	75 Ω
Maximum Output Voltage	±1.5 V (DC + peak AC, at 75 Ω termination)
Output Voltage Accuracy	±2 % (DC)
Frequency Response	±5 % (DC to 5 MHz)

2.3.3 Control Connectors

PC Interface

Specifications	USB 1.1
Port	Type B
Function	Transmits settings and measured data
Camera Control	Custom order feature

2.3.4 Automatic Self Check

Offset Calibration

Calibration Voltage	0 mV
Criterion	
Range 1	±10 mV
Range 2	±5 mV
Range 3	±2.5 mV

DC Voltage Calibration

Calibration Voltage	
Range 1	±2 V
Range 2	±1 V
Range 3	±0.5 V
Criterion	
Range 1	±60 mV
Range 2	±30 mV
Range 3	±15 mV

AC Voltage Calibration (Level Calibration Only)

Calibration Voltage	
Range 1	2 Vp-p
Range 2	2 Vp-p
Range 3	1 Vp-p
Frequency	3.6 MHz ± 0.5 %
Criterion	
Range 1	±60 mV
Range 2	±60 mV
Range 3	±30 mV

2.3.5   Measurable Items

Measurement Signal   NTSC or PAL composite video signal

V-Sync Frequency
  Description   Measures the frequency of the vertical sync signal
  Measurement Range   10 to 100 Hz
  Measurement Accuracy   ±0.1 %

H-Sync Frequency
  Description   Measures the frequency of the horizontal sync signal
  Measurement Range   10 to 20 kHz
  Measurement Accuracy   ±0.1 %

Sync Level
  Description   Measures the amplitude of the horizontal sync signal
  Measurement Range   100 to 500 mV
  Measurement Accuracy   See "Voltage Measurement Accuracy" in section 2.3.1, "Waveform Input."

Burst Frequency
  Description   Measures the frequency of the color burst signal
  Measurement Range   3 to 4 MHz
  Measurement Accuracy   ±0.1 % (25±5 °C)

Burst Level
  Description   Measures the maximum amplitude of the color burst signal
  Measurement Range   100 to 500 mV
  Measurement Accuracy   See "Voltage Measurement Accuracy" in section 2.3.1, "Waveform Input."

Luminance level
  Description   Measures over the specified range the amplitude of the luminance signal (Y signal) after separating Y and C components in reference to the pedestal level
  Measurement Range
    Range 1   ±3 V
    Range 2   ±1.5 V
    Range 3   ±0.75 V
  Measurement Accuracy   See "Voltage Measurement Accuracy" in section 2.3.1, "Waveform Input."

Color Level
    Description   Measures over the specified range the amplitude of the color signal (Y signal) after separating Y and C components in reference to the pedestal level

    Measurement Range
        Range 1   ±3 V
        Range 2   ±1.5 V
        Range 3   ±0.75 V
    Measurement Accuracy   See "Voltage Measurement Accuracy" in section 2.3.1, "Waveform Input."

Peak Level
    Description   Measures over the specified range the maximum value of the video signal

    Measurement Range
        Range 1   ±3 V
        Range 2   ±1.5 V
        Range 3   ±0.75 V
    Measurement Accuracy   See "Voltage Measurement Accuracy" in section 2.3.1, "Waveform Input."

2.3.6   General Specifications

Environmental Conditions
    Operating Temperature   0 to 40 °C
    Operating Humidity Range   85 %RH or less (no condensation)
    Optimal Temperature   10 to 35 °C
    Operating Environment   Indoors
    Elevation   Up to 2,000 m
    Overvoltage Category   II
    Pollution Degree   2
Power Requirements
    Voltage   24 VDC
    Power Consumption   60 W max.
Dimensions   205 (W) × 35 (H) × 125 (D) mm (excluding protrusions)
Weight   0.9 kg
Accessories   CD-ROM (PC application, instruction manual) 1
Sold Separately   AC adapter

3.   PANEL DESCRIPTION

● **Front Panel**
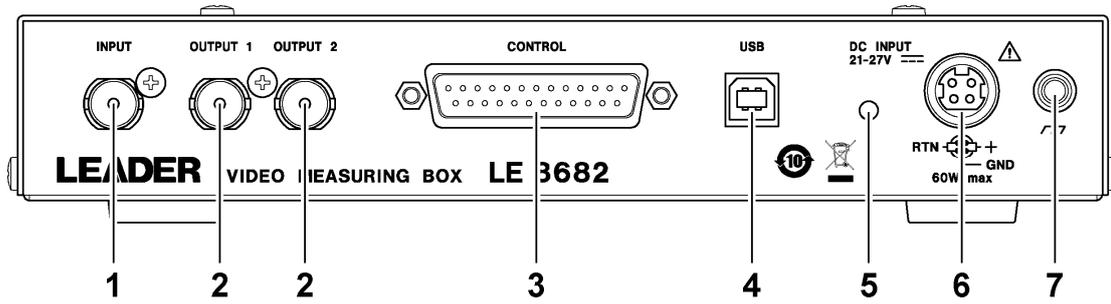
● **Rear Panel**

● **Panel Description**

No.	Name	Description
1	INPUT	Receives NTSC or PAL composite video signals.
2	OUTPUT 1 OUTPUT 2	Transmits the signal that is received through INPUT (active through).
3	CONTROL (custom order feature)	Controls a camera and supplies power. For details, contact your nearest LEADER agent.
4	USB	Connects to a PC and receives LE 8682 settings and measured values from the PC.
5	Power LED	Lights in green when the power is on.
6	DC INPUT	Connect the AC adapter sold separately.
7	Ground terminal	Used to connect the instrument to an external ground.
8	Serial number label	The serial number is printed on this label.

4. BEFORE YOU BEGIN MEASURING

4.1 System Overview

The LE 8682 measures the NTSC/PAL composite video signal received through INPUT. You can retrieve the measured values from a PC that is connected to the LE 8682 through USB. OUTPUT 1 and 2 provide active through output of the signal received through INPUT. Connect image processing boards and the like to these connectors.
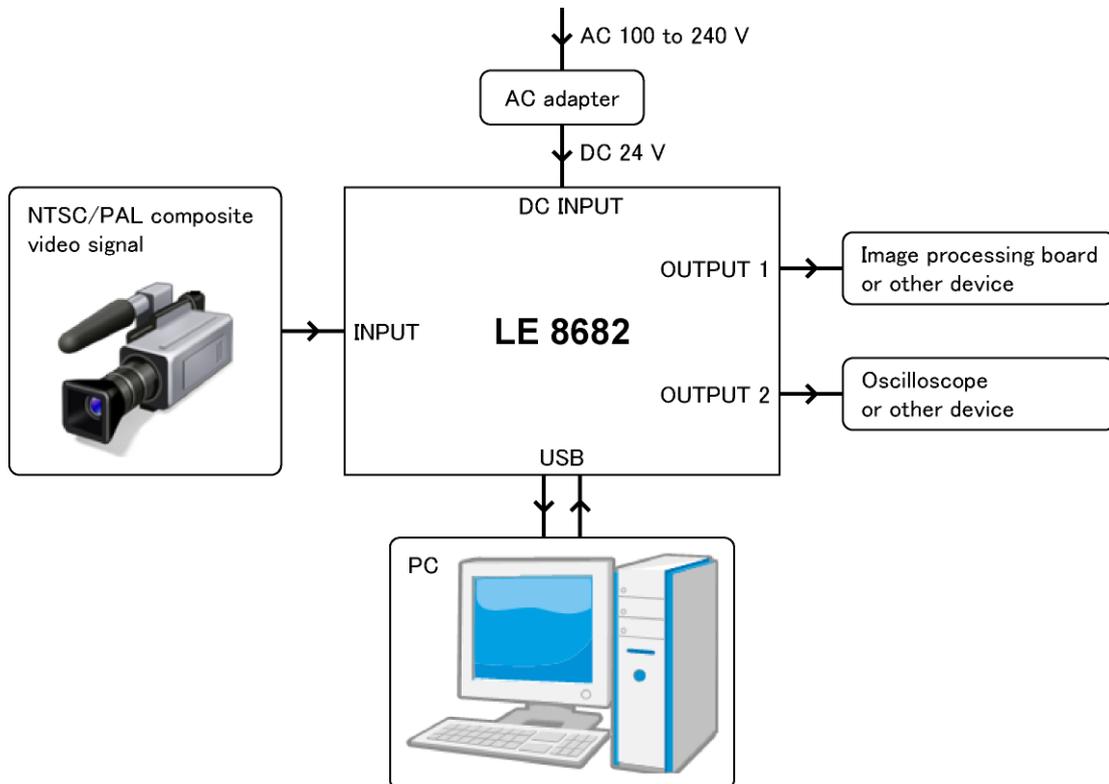
● **PC System Requirements**

OS: Windows XP (SP2 and later), Windows 7, Windows 8
Required software: .NET Framework Client Profile

4.2 Installing the USB Driver

Follow the procedure below to install the USB driver in your PC.

For the USB driver, use LE9280_04B_CommClass_32.inf or LE9280_04B_CommClass_64.inf in the supplied CD-ROM.

```
⊚ CD-ROM
├ ▢ DRIVER
|  └ ▢ USB_CommClass_INF
|       ├ ▢ LE9280_04B_CommClass_32.inf...........USB driver (32 bit version)
|       └ ▢ LE9280_04B_CommClass_64.inf...........USB driver (64 bit version)
├ ▢ Instruction_Manual_for_LE_8682
└ ▢ PC_SOFT
```
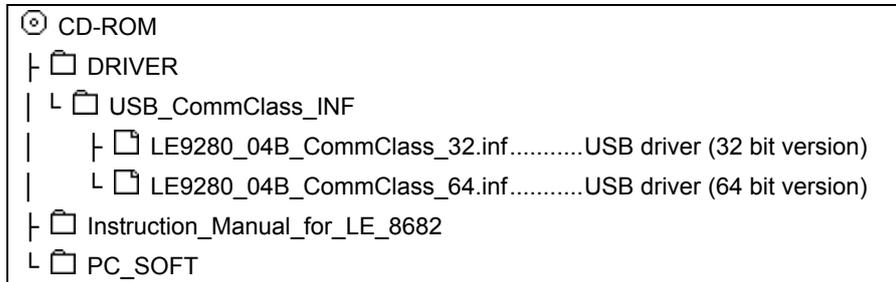
1. **Load the supplied CD-ROM in your PC.**

2. **Connect the AC adapter to the LE 8682 to turn it on.**

   The LE 8682 does not have a power switch. The power turns on when you connect the AC adapter.

3. **Using a USB cable, connect the LE 8682 USB port to the PC's USB port.**

   Found New Hardware Wizard appears.

4. **Select "No,..." and click Next.**

5.　Select "Install from a list..." and click Next.
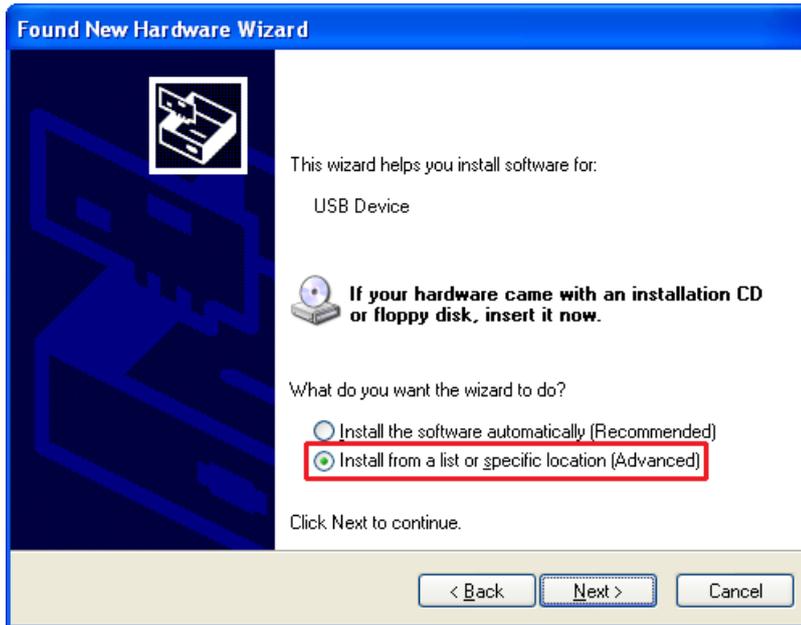
6.　Select "Search removable media..." and click Next.

7. Select the appropriate version (32 bit or 64 bit), and click Next.
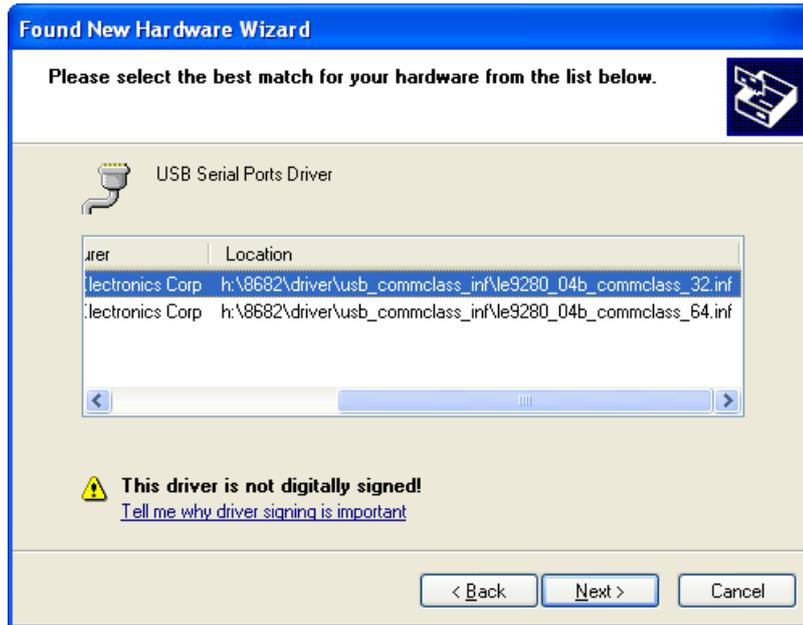
8. When the following window appears, click Next.

11

9. **When the following window appears, the installation is complete. Click Finish.**
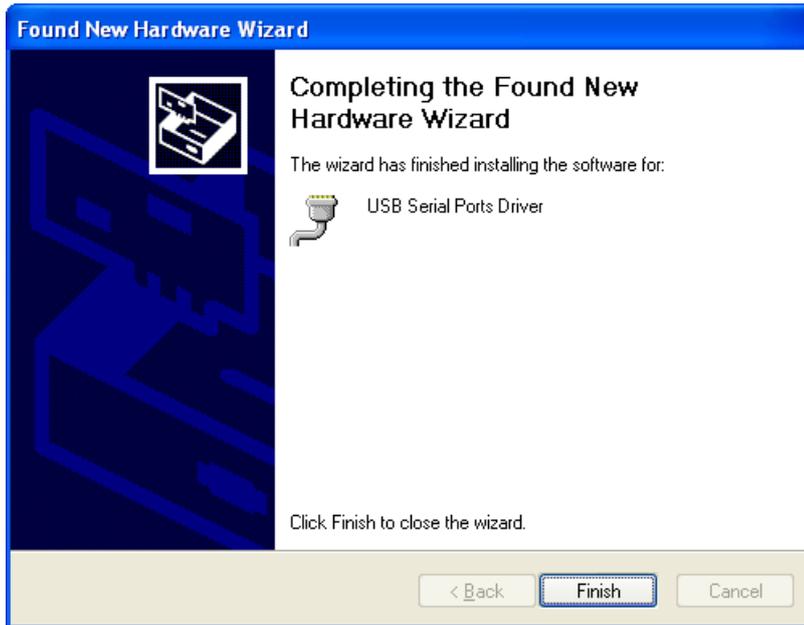
You can check the installed USB driver under Ports in Device Manager.
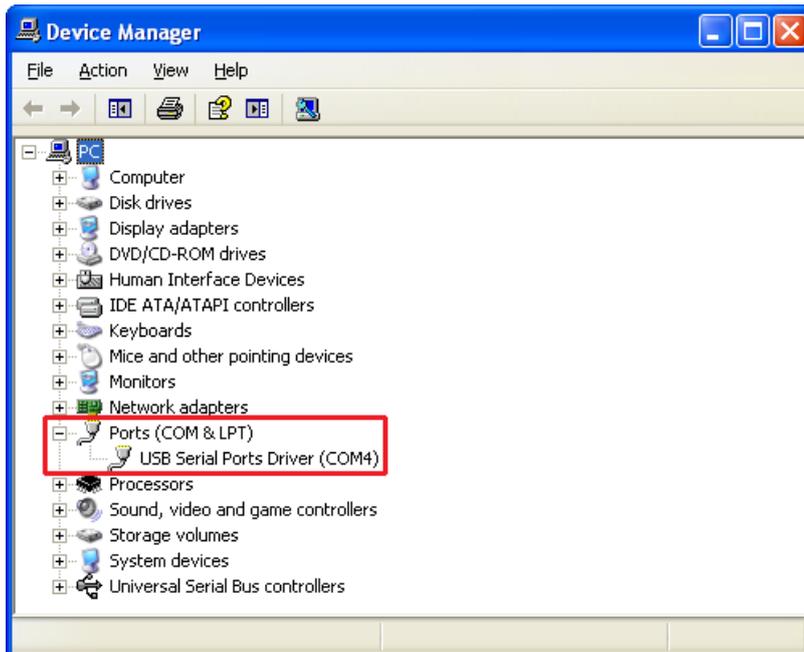
4.3 Starting the PC Application

Copy the entire Release_*** folder on the supplied CD-ROM to your PC in the location of your choice.
To start the PC application, click LE8682Soft.exe.

```
⊘ CD-ROM
├ 🗀 DRIVER
├ 🗀 Instruction_Manual_for_LE_8682
└ 🗀 PC_SOFT
    └ 🗀 Release_*** ..............................Copy to the PC.
        ├ 🗀 LE8682Soft.exe  ..................PC application
        ├ 🗀 LE8682Soft.exe.config
        └ 🗀 LE8682Soft.pdb
```
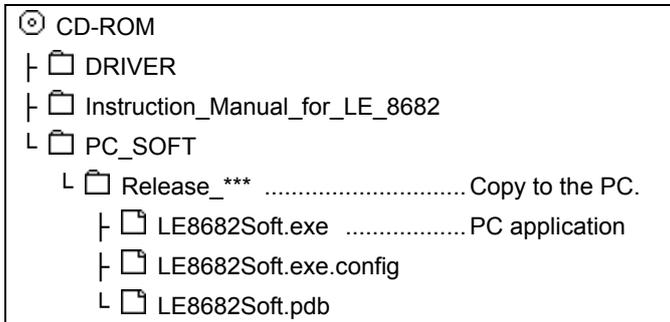
*   To start the PC application, .NET Framework Client Profile must be installed in your PC. Install it from Microsoft Website.

5.   HOW TO USE

5.1   Measurement Procedure

1. **Connect the AC adapter to the LE 8682 to turn it on.**

    The LE 8682 does not have a power switch. The power turns on when you connect the AC adapter.

2. **Using a USB cable, connect the LE 8682 USB port to the PC's USB port.**

3. **Start the PC application.**

4. **Select the COM port, and click Open.**

    "COM* OPEN" appears at the lower left of the window.
    If you cannot select the COM port, close the PC application, and remove the USB cable. Reconnect the cable, and restart the PC application.
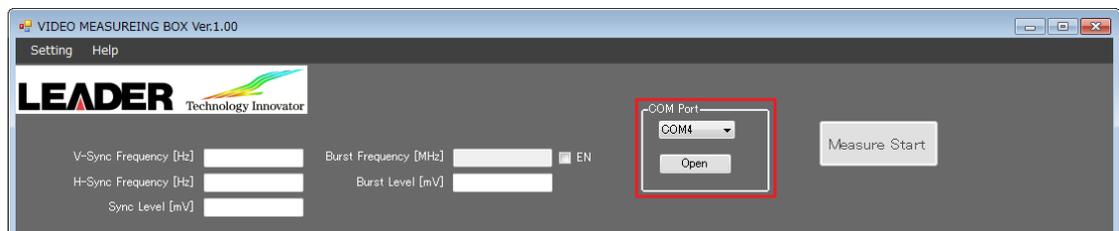
5. **On the Setting menu, click Window Setting. Set the measurement ranges, and close the window.**

    The settings specified here will be cleared when the LE 8682 is turned off. You must set them every time you turn the LE 8682 on.
    You can set up to 32 measurement ranges. On the measurement window, eight ranges that you select are displayed.
    Reference   5.2.2, "Window Setting"
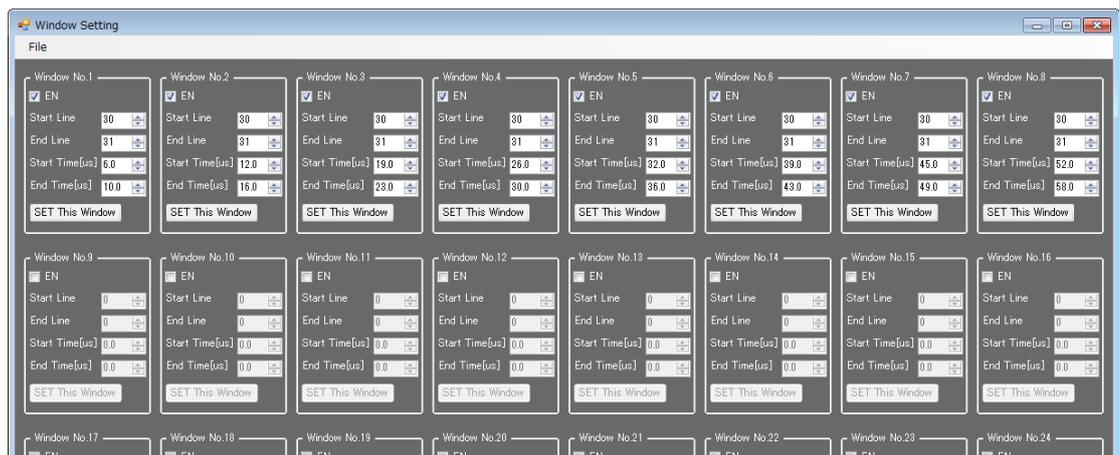
6. **Select the window number.**

   On the PC application, up to eight ranges can be measured simultaneously.
   The available window numbers are those whose EN check boxes have been selected in
   the Window Setting window.
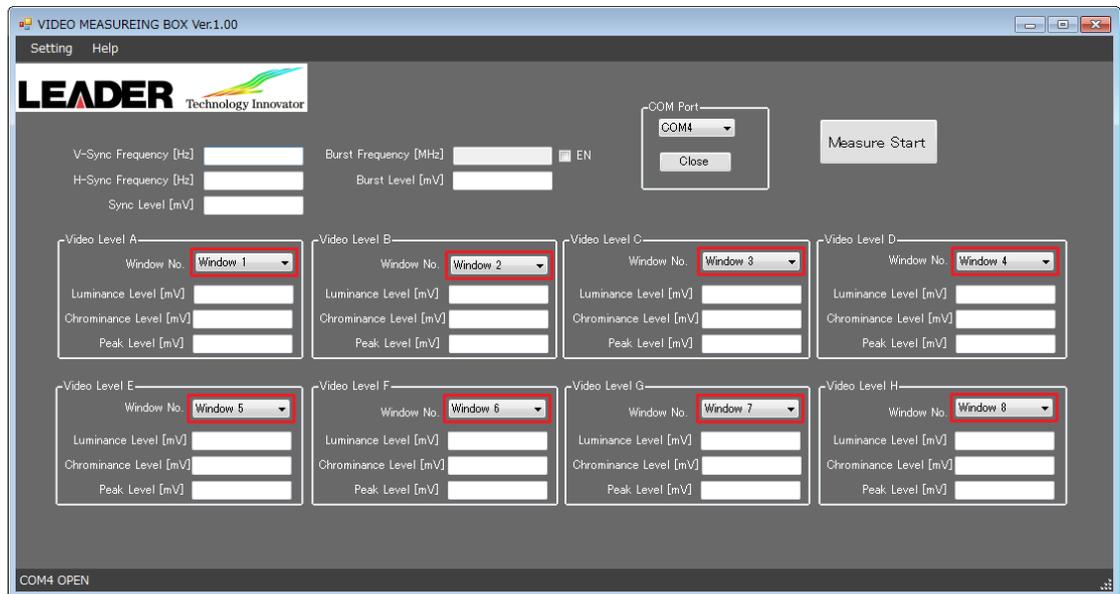
7. **Apply an NTSC/PAL composite video signal to the INPUT connector of the LE 8682.**

8. **Click Measure Start.**

   The measurement is repeated at approximately 600 ms intervals.
   To stop measurement, click Measure End.

15
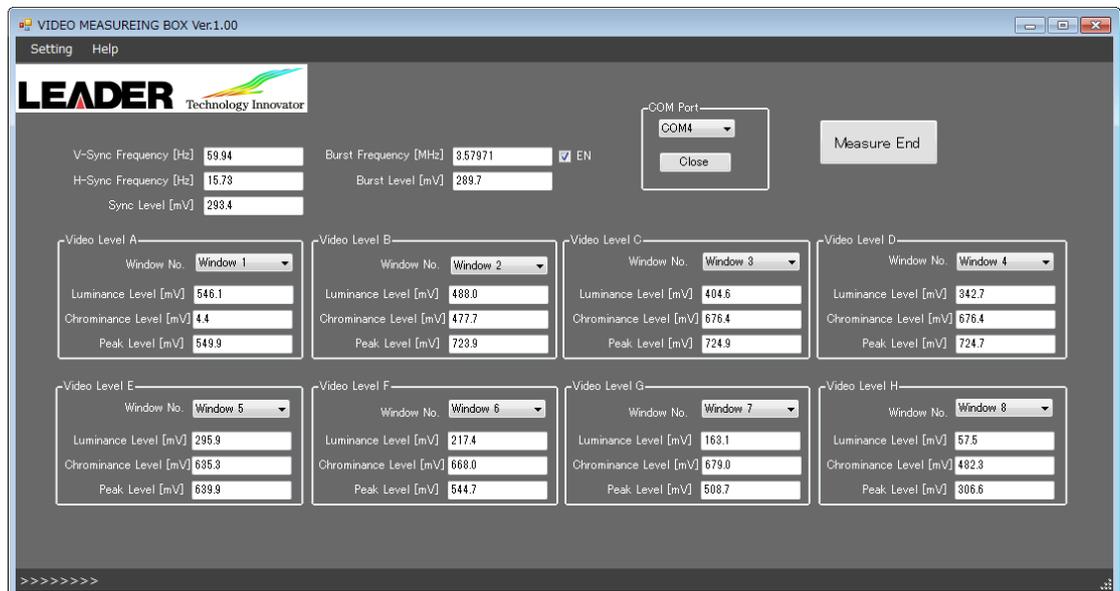
5.2 PC Application Description

5.2.1 Measurement Window

The measurement window appears when the PC application starts.

1. **Menu**

Menu		Description
Setting	Window Setting	Set the measurement range. Reference 5.2.2, "Window Setting"
	Level unit	Set the level display unit to mV or IRE.
Help	Version Inf.	Displays the following information in order. • PC application version • LE 8682 serial number • LE 8682 CPU version • LE 8682 FPGA version

2. **COM Port**

   Selecting a port and clicking Open connects the PC to the LE 8682.
   To disconnect, click Close.

3. **Measure Start ⁄ Measure End**

   Starts or stops measurement.

4. **Measured values**

   Displays the input signal frequency, level, etc.
   The burst frequency is measured only when the EN check box is selected. The value
   is obtained by averaging the previous 10 measurements. Therefore, no value will
   appear until 10 measurements have been made.

5. **Signal Level A to H**

   Displays the input signal levels for the measurement range corresponding to the
   selected Window No.
   The available window numbers are those whose EN check boxes have been selected
   in Window Setting.

6. **Information display**

   COM* CLOSE

   Appears when the PC and LE 8682 are not connected.

   COM* OPEN

   Appears when the PC and LE 8682 are connected when measurement is stopped.

   >>>>>

   Appears when measurement is in progress. The ">" character is added each time a
   measurement is made.

5.2.2   Window Setting

The Window Setting window appears when you click Window Setting on the Setting menu of the measurement window. This window is used to set measurement ranges. Window Setting is not available when the PC and LE 8682 are not connected.

You can set up to 32 measurement ranges. On the measurement window, eight ranges that you select are displayed.
The settings specified here will be cleared when the LE 8682 is turned off. You must set them every time you turn the LE 8682 on.
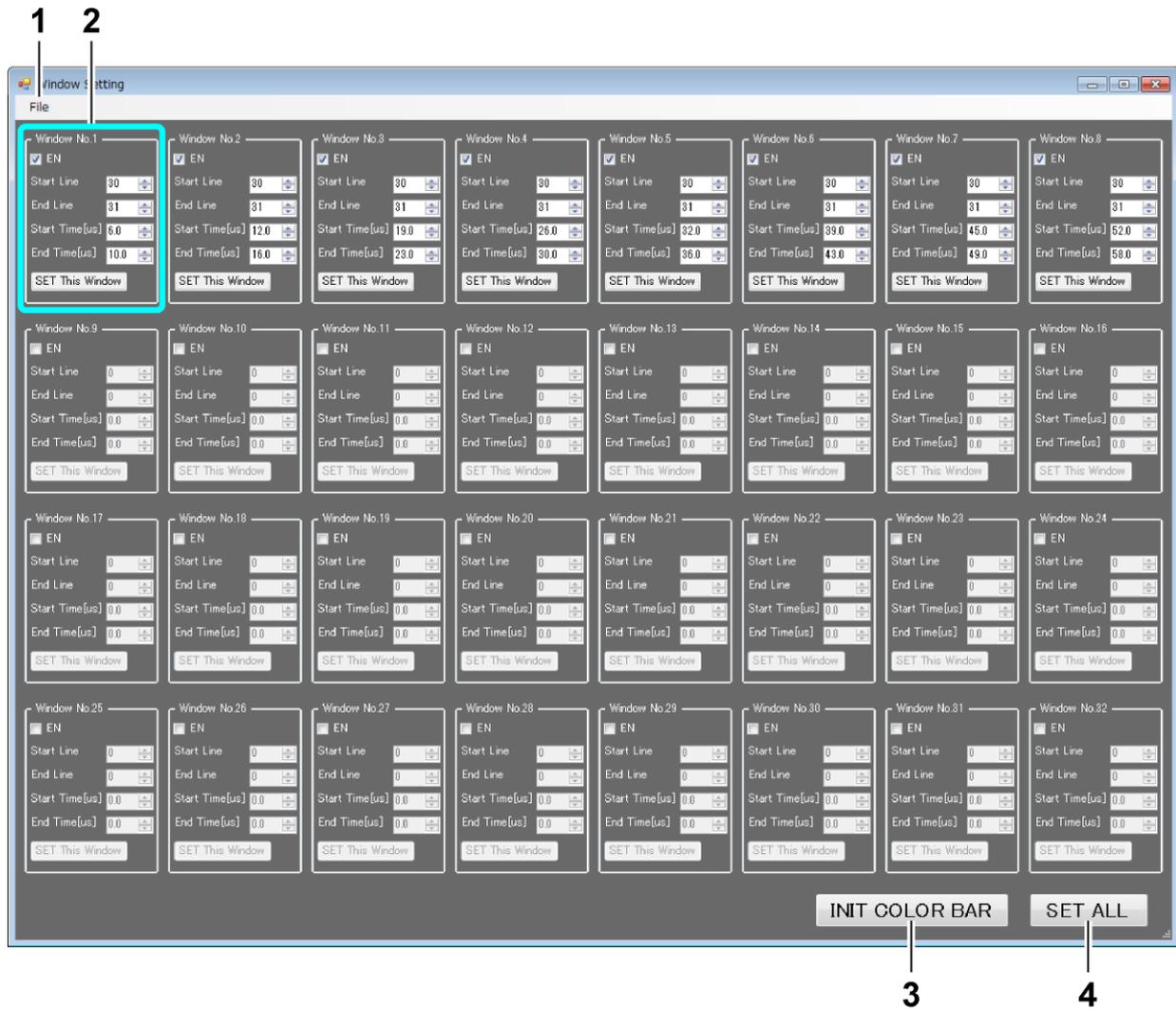
1. **File**

   Open

   Opens a setup file that has been saved.

   Save

   Saves the settings with a name.

2. **Window No.1 to 32**

   EN

   Select the check box to enable the measurement range and allow it to be selected with Window No. in the measurement window.

   Start Line ∕ End Line

   Enter the measurement start and end lines in the range of 21 to 263 and 283 to 525, respectively.
   Enter a larger number for End Line than Start Line. Also, set the difference between the start and end lines to 20 or less.

   Start Time ∕ End Time [us]

   Enter the measurement start and end times in the range of 5.0 to 63.5 assuming the rising edge of the horizontal sync signal to be 0 [us].
   Enter a larger number for End Time than Start Time.

   SET This Window

   Apply the settings for each window.

3. **INIT COLOR BAR**

   Sets Window No. 1 to 8 to the measurement ranges appropriate for the color bar.
   To apply the settings, click SET ALL.

4. **SET ALL**

   Applies the settings of all windows.

6. REMOTE CONTROL

By using remote control commands, you can configure the LE 8682 and retrieve measured values from a PC.

6.1 Command Structure

● **Send**

Tx commands are constructed from a command, parameters, and delimiters.

[Command] + [space] + [parameter 1] + [space] + [parameter 2] + [space] + . . . + [delimiter]

• **Command**

ASCII code. Enter a space code between the command and the parameters.

• **Parameters**

ASCII code. To specify multiple parameters, enter a space between them.

• **Delimiter**

LF (0x0A).

● **Response**

When the LE 8682 appropriately receives a Tx command, it returns "A" (ACK).
Depending on the command, the LE 8682 returns a setting when a question mark is specified for a parameter.
If an error occurs, the LE 8682 returns an error message.
The corresponding response messages are constructed in the same manner as the Tx commands.

The error message format is "ERR[error code]".

Error Code	Description
01	Invalid command.
11	Invalid parameter (value, range, etc.).
31	Not configured to make measurements.
51	Unable to retrieve measured values (timeout).
52	Measurement out of range (upper limit).
53	Measurement out of range (lower limit).
99	Other errors.

6.2 Commands

No.	Command	Tx Parameter		Description
1	RANGE	p1	1 to 3 / ?	Sets the input range
2	VFRQ	p1	?	Queries the V-sync frequency
3	HFRQ	p1	?	Queries the H-sync frequency
4	SNCLEV	p1	?	Queries the sync level
5	BSTFRQ	p1	?	Queries the burst frequency
6	BSTLEV	p1	?	Queries the burst level
7	VIDEOWIN			Sets the measurement range
		p1	1 to 32	Selects a window
		p2	300 to 3411 / ?	Sets or queries the start time
		p3	21 to 263 / 283 to 525	Sets the start line
		p4	300 to 3411	Sets the end time
		p5	21 to 263 / 283 to 525	Sets the end line
8	VIDEOSIG			Queries the video signal level
		p1	1 to 32	Selects a window
		p2	?	Query
9	CHECK	p1	?	Executes self check
10	VER	p1	?	Queries the version

6.3   Command Details

1. Sets the input range

   ● **Tx Command**

Command	Tx Parameter		Description
RANGE	p1	1	Range 1 (±3 V input)
		2	Range 2 (±1.5 V input)
		3	Range 3 (±0.75 V input)
		?	Query

   ● **Response Message**

   When p1 is 1 to 3 .... A (ACK)
   When p1 is ? .... 1 to 3 (range 1 to 3)

   ● **Example**

   [Tx] RANGE 1 .... Sets range 1
   [Response] A....................................... ACK
   [Tx] RANGE ? .... Queries the range
   [Response] RANGE 1 .... Range 1

2. Queries the V-sync frequency

   ● **Tx Command**

   VFRQ ?

   ● **Response Message**

   1 digit integer + 3 digit decimal + 2 digit exponent [Hz]

   ● **Example**

   [Tx] VFRQ ?....................................... Queries the V-sync frequency
   [Response] VFRQ 5.994E+01 .... 59.94 Hz

3. Queries the H-sync frequency

   ● **Tx Command**

   HFRQ ?

   ● **Response Message**

   1 digit integer + 3 digit decimal + 2 digit exponent [Hz]

   ● **Example**

   [Tx] HFRQ ?....................................... Queries the H-sync frequency
   [Response] HFRQ 1.573E+04 .... 15.73 kHz

4. **Queries the sync level**

    ● **Tx Command**

    SNCLEV ?

    ● **Response Message**

    1 digit integer + 3 digit decimal + 2 digit exponent [mV]

    ● **Example**

    [Tx] SNCLEV ?...................................Queries the sync level
    [Response] 2.940E+02 ....294.0 mV

    *   Even if "IRE" is specified on the PC, the value is returned in millivolts.

5. **Queries the burst frequency**

    ● **Tx Command**

    BSTFRQ ?

    ● **Response Message**

    1 digit integer + 6 digit decimal + 2 digit exponent [Hz]

    ● **Example**

    [Tx] BSTFRQ ? ....Queries the burst frequency
    [Response] BSTFRQ 3.579919E+06 .. 3.5799 MHz

6. **Queries the burst level**

    ● **Tx Command**

    BSTLEV ?

    ● **Response Message**

    1 digit integer + 3 digit decimal + 2 digit exponent [mV]

    ● **Example**

    [Tx] BSTLEV ? ....Queries the burst level
    [Response] BSTLEV 2.921E+02.........292.1 mV

    *   Even if "IRE" is specified on the PC, the value is returned in millivolts.

7. Sets the measurement range

● **Tx Command**

Command		Tx Parameter	Description
VIDEOWIN	p1	1 to 32	Window number
	p2	300 to 3411	Measurement start time [ns] (1 = 16.67 ns)
		?	Query (parameters p3 to p5 are unnecessary)
	p3	21 to 263, 283 to 525	Measurement start line
	p4	300 to 3411	Measurement end time [ns] (1 = 16.67 ns)
	p5	21 to 263, 283 to 525	Measurement end line

● **Response Message**

When p1 to p5 are sent........................ A (ACK)
When p2 is ?....................................... p1 to p5

● **Example**

[Tx] VIDEOWIN 1 300 21 500 30 .... Sets the measurement range of window 1
[Response] A....................................... ACK
[Tx] VIDEOWIN 1 ?............................. Queries the measurement range of window 1
[Response] VIDEOWIN 1 300 21 500 30

　　　　　　　　　　　　　　　　　　　Returns the measurement range of window 1

8. Queries the video signal level

● **Tx Command**

Command		Tx Parameter	Description
VIDEOSIG	p1	1 to 32	Window number
	p2	?	Query

● **Response Message**

Command		Response Parameter	Description
VIDEOSIG	p1	1 to 32	Window number
	p2	Luminance level	1 digit integer + 3 digit decimal + 2 digit exponent [mV]
	p3	Color level	
	p4	Peak level	

● **Example**

[Tx] VIDEOSIG 1 ?............................. Queries the video signal level of window 1
[Response] VIDEOSIG 1 3.660E+02 4.875E+00 3.688E+02

　　　　　　　　　　　　　　　Luminance level:　366.0 mV
　　　　　　　　　　　　　　　Color level:　4.875 mV
　　　　　　　　　　　　　　　Peak level:　368.8 mV

*　　Even if "IRE" is specified on the PC, the value is returned in millivolts.

9. **Executes self check**

   ● **Tx Command**

   CHECK ?

   ● **Response Message**

   The response takes approximately 2 seconds.

Command	Response Parameter		Description
CHECK	p1	OK	Self check successful (no p2)
		NG	Self check failure
	p2	001 to 333	Range 1 result + Range 2 result + Range 3 0: Both DC calibration and AC calibration are within the specifications. 1: DC calibration is outside the specifications. AC calibration is within the specifications. 2: DC calibration is within the specifications. AC calibration is outside the specifications. 3: Both DC calibration and AC calibration are outside the specifications.

   ● **Example**

   [Tx] CHECK ? ....Executes self check
   [Response] CHECK NG 123 ....Self check failure
   Range 1:   DC calibration is outside the range.
   Range 2:   AC calibration is outside the range.
   Range 3:   Both DC calibration and AC calibration are outside the specifications.

10. **Queries the version**

    ● **Tx Command**

    VER ?

    ● **Response Message**

Command	Response Parameter		Description
IMES	p1	Serial number	7 digit integer
	p2	CPU Version	Integer + 2 digit decimal
	p3	FPGA version	Integer + 2 digit decimal
	p4	Hardware version	4 digit integer

    ● **Example**

    [Tx] VER ? ....Queries the version
    [Tx] VER 1234567 1.00 1.02 0000......Serial number: 1234567
    CPU version: 1.00
    FPGA version: 1.02
    Hardware version: 0000

所含有毒有害物质信息

部件号码：LE 8682

此标志适用于在中国销售的电子信息产品,依据2006年2月28日公布的
《电子信息产品污染控制管理办法》以及SJ/T11364-2006《电子信息产品污染
控制标识要求》，表示该产品在使用完结后可再利用。数字表示的是环境保护使
用期限，只要遵守与本产品有关的安全和使用上的注意事项，从制造日算起在数
字所表示的年限内，产品不会产生环境污染和对人体、财产的影响。
产品适当使用后报废的方法请遵从电子信息产品的回收、再利用相关法令。
详细请咨询各级政府主管部门。

产品中有毒有害物质或元素的名称及含量

部件名称 Parts	有毒有害物质或元素　Hazardous Substances in each Part					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
实装基板	×	○	×	○	○	○
主体部	×	○	○	○	○	○
外筐	×	○	○	○	○	○
线材料一套	×	○	○	○	○	○
包装材	○	○	○	○	○	○

备注）
　○：表示该有毒有害物质在该部件所有均质材料中的含量均在SJ/T11363-2006 规定的限量要求以下。
　×：表示该有毒有害物质或元素至少在该部件的某一均质材料中的含量超出SJ/T11363-2006
　　　标准规定的限量要求。

Ver.1