

PRINCO™

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with the user in mind*

Programming Instructions
Princo Eview and Eview Light
HART® Configuration Software

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EView and EView Light

HART® Configuration Software

Programming Instructions

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1. General

1.1 The HART Signal

HART ("Highway Addressable Remote Transducer") is a popular digital communication protocol designed for industrial process measurement applications. The special feature is that it uses a low-level modulation superimposed on the standard 4-20 mA current loop, which is now widely used for such measurements. Because the HART signal is small, and composed of sine waves, its average value is zero and does not significantly affect the accuracy of the analog current signal, which can therefore still be used. This provides compatibility with existing systems, while allowing simultaneous digital communication for device configuration, status checking, diagnostics and so forth.

1.2 HART Networks – Point-to-Point, Multidrop & Multiplexed

HART devices can operate in one of two network configurations – point-to-point or multidrop.

In point-to-point mode, the traditional 4-20 mA signal is used to communicate one process variable, while additional process variables, configuration parameters, and other device data are transferred digitally using the HART protocol. The 4-20 mA signal is not affected by the HART signal and can be used for control in the normal way. The HART communications digital signal gives access to secondary variables and other data that can be used for operations, commissioning, maintenance, and diagnostic purposes. In point-to-point mode the device polling address must be 0.

The multidrop mode of operation requires only a single pair of wires and, if applicable, safety barriers and an auxiliary power supply for up to 15 field devices. All process values are transmitted digitally. In multidrop mode, all field device polling addresses are >0, and the current through each device is fixed to a minimum value (typically 4 mA).

HART-compatible multiplexers are ideal for users who want to interface with a large number of HART devices. Multiplexers can be modular and are capable of supporting both point-to-point and multidrop communication modes. Multiplexers may be employed in situations where it is necessary to communicate with a number of HART devices and still maintain the 4-20 mA output control capabilities of each unit. This type of setup loses the advantage of being able to wire a group of devices on a single pair of wires.

For in depth descriptions of HART capabilities, visit the HART Communications Foundation website: www.hartcomm.org. Refer to HART Application Guide, HCF LIT 34.

1.3 EView and EView Light Software

EView and EView Light software have been designed for detection, polling and viewing data, and remote programming of Princo's ultrasonic compact SmartSonic level transmitters. Models L4660-S__ - 3__ -3, -4, and -8 are provided with HART interface. EView Light software, provided at no extra cost with each HART SmartSonic unit, is used only for point-to-point communications mode (for remote programming and viewing of one SmartSonic). EView multidrop mode communications software (part no. SAS-302) is available from Princo at additional cost.

Installed in a PC, the software allows menu-driven remote programming (device parameters + HART commands) with the exception of access to the simulation functions of the SmartSonic. The software supports cyclic polling, i.e. collecting data from the SmartSonic unit detected (identified) and viewing of the measurement data.

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The functions in detail:

- Detection of the SmartSonic
- Universal HART commands – for viewing of primary measurement data of field devices other than SmartSonic
- SmartSonic device specific commands:
 - Parameter: downloading from field device
 - Parameter: editing, uploading into the field device
 - Parameter: saving on hard disc
 - Linearization table: downloading from field device
 - Linearization table: editing, uploading into the field device
 - Linearization table: saving on hard disc
 - Viewing Echo Map
 - Viewing informational parameters
 - Resetting aggregated value totalizer TOT1
 - Use of the secret code

EView cannot be applied for data logging.

EView is acting as primary master on the network. While running the program, the use of an active secondary (handheld) master unit is forbidden.

2. Network arrangement

PC	Modem	SmartSonic Models
IBM PC/AT compatible, with Windows 98 or higher and with 5MB hard disk capacity for EView only	Princo Model SAT-304 or any Hart-RS232 converter available in the market	L4660-S__ - 3__ -3, L4660-S__ - 3__ -4, L4660-S__ - 3__ -8

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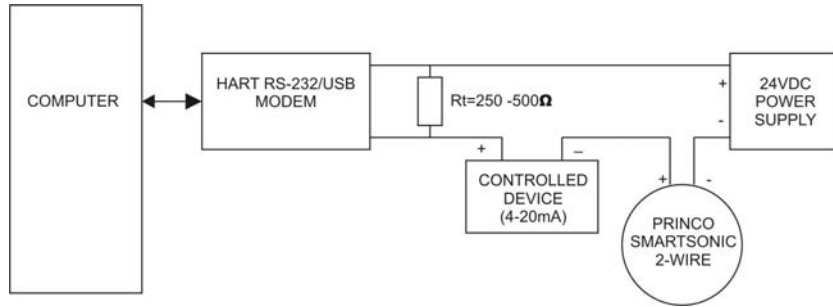


Figure 1: Point-to-Point Wiring Diagram for 2-Wire (loop-powered) Units

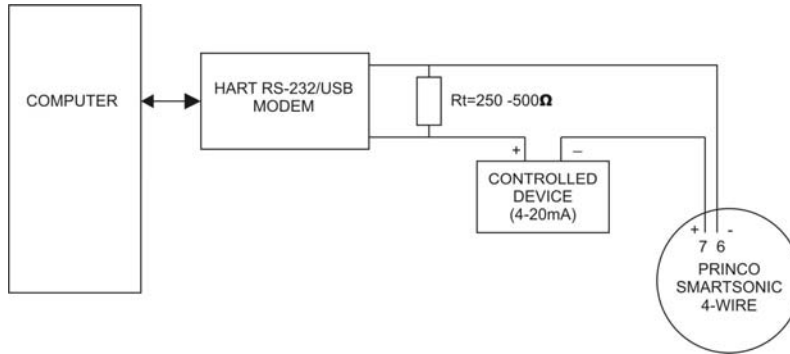


Figure 2: Point-to-Point Wiring Diagram for 4-Wire Units

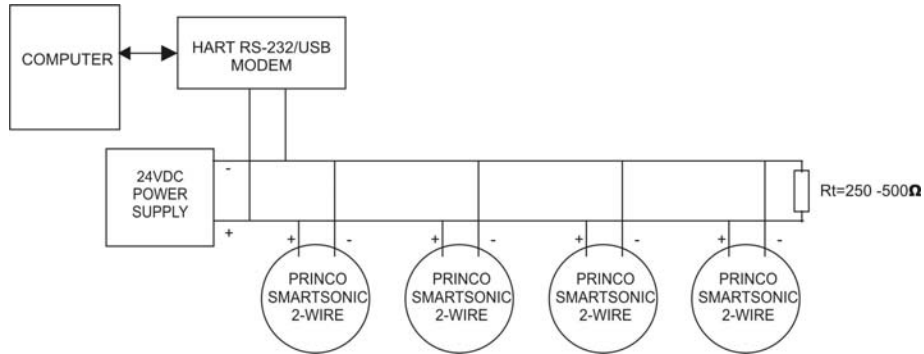


Figure 3: Multidrop Wiring Diagram for 2-Wire (loop-powered) Units

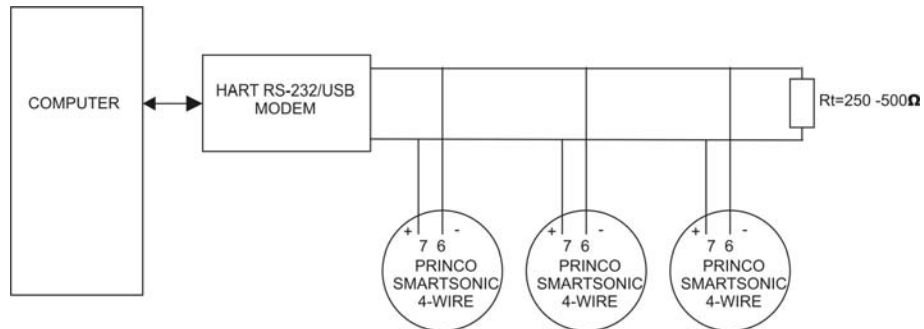


Figure 4: Multidrop Wiring Diagram for 4-Wire Units

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3. Installation of the software

Put EView Light CD in computer CD drive. Follow the instructions on the display for installing EView Light. (If given a choice of "run" or "save", choose "run".)

Note! For correct operation of the HART modem, the software will change the windows serial driver called "serial.vxd". The original driver will be renamed to "serial.vx". The new driver handles the RS232 serial port handshake line (RTS) differently from standard applications. If you have any problem with this serial port in another application, then change back the serial driver to the original one and restart your windows.

4. Introduction of the software

4.1 Start running:

For starting, click on the EView Light Configurator icon on the Windows desktop or follow the standard Windows procedure: Start/ Programs/ Nivelco/ EView Light Configurator

Setting COM port: Choose Setup/ Preferences on the Menu bar and set to the proper COM port number. A modem with an RS-232 connector connects directly to a COM port on the computer. When using a modem with a USB connection, the computer assigns a COM port number to the USB port. If you are not sure which COM port you are connected to, you may use trial and error, or go to: My Computer/ View System Information/ Hardware/ Device Manager/ Port (COM & LPT)/ USB Serial Port (COM #) on Windows XP. If the program is not set up for the same COM port or USB port which your modem is plugged into, the program will fail to detect a device when *Detect* is clicked.

4.2 Main window - arrangement and information

After start up the following screen (Figure 5) will appear.

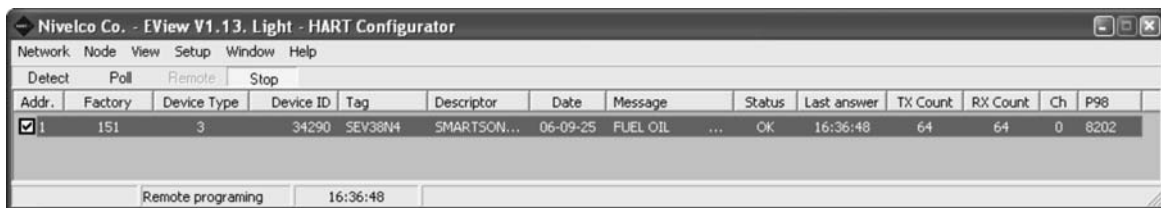


Figure 5: EView Light Main Window

4.2.1 Fields of the main window

- Menu bar (Network, Node, View, Setup, Window, Help)
- Speed buttons (Detect, Poll, Remote, Stop)
- Network node list (Addr. Factory, Device type, etc.)
- Status bar (Status program, time, etc.)

4.2.2 Information of the node list

- **Address:** of the field device, "0" for single device, 1 to 15 for network with more than one device
- **Factory:** code assigned to Princo by HART Communication Foundation (fixed: 151)

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- **Device type:** Princo's device number with HART communication
- **Device ID:** electronic serial number of the device type (assigned by the factory)
- **Tag:** 8 byte field provided for the user to identify device within the process
- **Descriptor:** 16 byte field provided for the user to identify the process medium
- **Date:** Timestamp of the last change of Tag or Descriptor
- **Message:** 32 byte field provided for the user to formulate any message
- **Status:** Result of the last device query
- **Last answer:** Timestamp of the last device query

Note: The relevant data of the node list are stored in the field device.

Operation modes, menus, speed buttons:

Menu	Speed Button	Function
<i>Network / Detect</i>	<i>Detect</i>	Scanning and detection of SmartSonic by address
<i>Network / Poll</i>	<i>Poll</i>	Continuous polling checked devices
<i>Network / Stop</i>	<i>Stop</i>	Stop
<i>Node / Remote Programming</i>	<i>Remote</i>	Remote programming highlighted device
<i>View / Log</i>	none	Displays Communication Log
<i>Setup / Preferences</i>	none	COM port setting

5. Operation of the network

5.1 Addressing devices

Units are sent from the factory with a polling address of "0". If the unit is to be used in point-to-point operation (only one unit in the network), then no change of address is necessary.

When establishing a new network, devices have to be addressed first in Parameter P19 of the SmartSonic. This parameter can be accessed with the appropriate plug-in programming module (SAP-100 or SAP-200), or by initially setting up each unit in point-to-point mode. Once set up in multidrop mode, polling addresses can only be changed using the programmer.

Up to 15 devices can be integrated in the network with addresses from 0 to 15.

It is recommended to assign address "0" to a single device (if using one SmartSonic and EView Light) and not assign "0" in the network with more than one device, because if the program finds a unit with address "0" first, it will be considered as the only one and detection as completed.

The analog signal of a device with address "0" provides output information (4-20mA signal) while the analog signal of devices with addresses other than "0" will be fixed at 4 mA.

Note! Do not assign the same address to more than one device!

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5.2 Programming and access to the features of operation:

After addressing, the device(s) can be identified by clicking on the speed button *Detect* or pressing key F5. Once successfully detected, the node list of all field devices will appear in the window. For programming, select the field device to be programmed and the Remote Programming window by clicking on the relevant node list and the speed button *Remote*. The following groups, called by pressing the relevant tabs, are used for programming and viewing. All, with the exception of HART Standard, access parameters as defined in the L4660 instruction manual. Refer to the appropriate manual for a complete description of each parameter.

- HART Standard: data of the actual application (Figure 6)
- Parameters: setting parameters of the field devices (Figures 7 and 8)
- Linearisation Table (Figure 9)
- Echo Map viewing (Figure 10)
- Informational parameters (viewing), reset totalizer TOT1, using Secret Code (Figure 11)
- Special: Quick calibration shortcuts (Figure 12)

5.2.1 Hart Standard

Chose *Hart Standard* by pressing the relevant tab (Figure 6). *Polling address*, *Tag*, *Descriptor*, *Date* and *Message* may be read and overwritten as desired. Refer to section 5.1 regarding polling addresses. Since these data are part of the node list, they will be sent to and stored in the field device. ("Refer to Information of the node list", Section 4.2)

The two *Read* buttons are useful for checking whether the proper text/data have been saved in the field device.

5.2.2 Parameters

The *Parameter* tab allows programming of parameters 1 through 47 as defined in the L4660 Instruction Manuals. Refer to the appropriate manual for a complete description of each parameter.

Parameters may be set according to parameter number as listed in the *Parameter* window (Figure 7), or by a descriptive, user-friendly mode as laid out in the *Profiler* window (Figure 8).

In the *Parameter* window, the current value of an individual parameters can be retrieved by selecting the boxes to the left of the parameters, then clicking on *Get*. (All parameters may be selected at once by



Figure 6. HART Standard Window

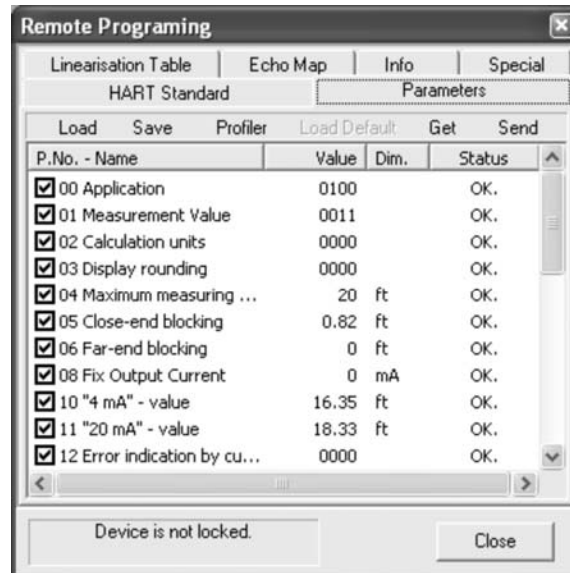


Figure 7. Parameters Window

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right-clicking the mouse and clicking “Select All” and then clicking on *Get*.) To change the value of a parameter, double left-click the parameter, put values into the *Edit parameter* window, and click OK to send to unit. When entering parameter values which require whole numbers such as P00, P01, etc., ignore the digits to the right of the decimal place. For example, enter “110” as “110.00”.

If the attempt to change a parameter is refused (due to value being out of the range or invalid code for the parameter) “Error” will appear under *Status* and the previous value will not be changed.

The *Profiler* windows (Figure 8) provide descriptive access to the parameters, and thus a more user-friendly means of setting them. By the use of the five tabs (representing parameter groups) parameters can be accessed and modified. Closing the *Profiler* window, parameters can be viewed (and possibly checked) in the *Parameters* window (Figure 7) before sending to the field devices by pressing the speed button *Send*. If the attempt is refused (due to a value being out of the range or invalid code for the parameter) *Error* appears under *Status* and the previous value will not be modified.

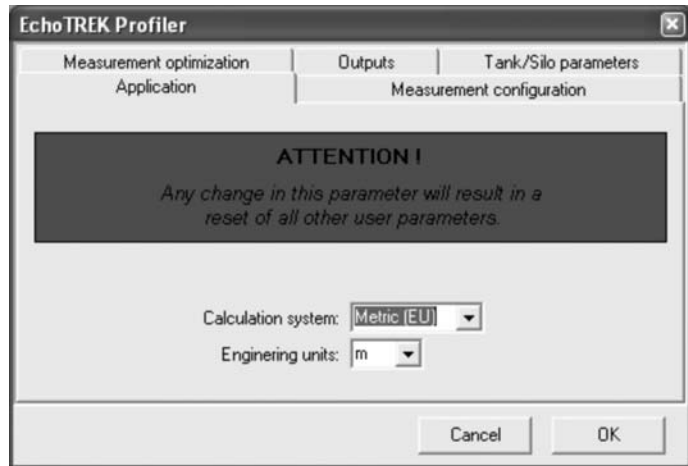


Figure 8. Profiler Window

Note: Setting Parameter P00 represents a special situation since changing of this parameter will result in loading the factory default with the corresponding engineering units.

Parameters set in the *Parameter* window can be saved in a file, so that they can be used for sending the entire parameter table to other field devices with the same application. For the speed buttons *Load*, *Save*, *Profiler*, *Get* and *Send* and their functions see table below.

Button	Function
<i>Load</i>	Loading a parameter table from a file
<i>Save</i>	Saving a parameter table to a file
<i>Profiler</i>	Series of user-friendly forms for setting parameters
<i>Get</i>	Loading parameter values from a field device
<i>Send</i>	Sending a parameter table to a field device

5.2.3 Linearisation table

The *Linearisation Table* tab allows programming of parameter 48 as defined in the L4660 Instruction Manuals. Refer to the appropriate manual for a complete description of this parameter.

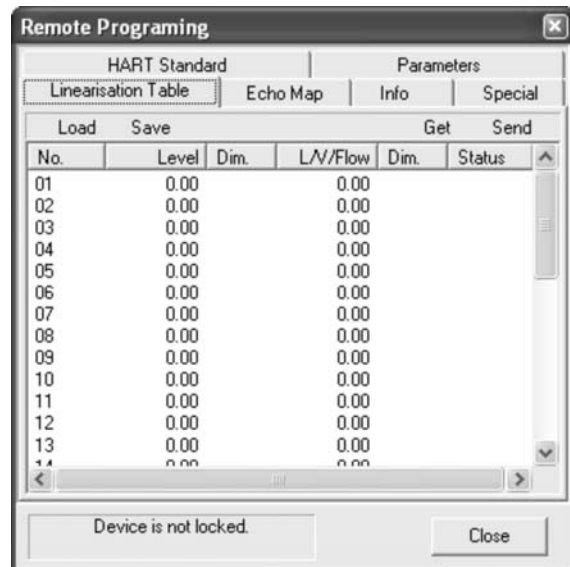


Figure 9. Linearisation Table Window

Left or right values of data pairs can be accessed by

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clicking twice on the appropriate row. Modified values may be sent to the field device by clicking *Send*, which checks modifications for correctness. If the modification not correct, *Error* appears under *Status* and the previous value will not be changed. If the modification correct, OK appears under *Status*. As with other parameter values, the linearisation table may be saved in a file for further use and uploaded to another field device (*Save* and *Load*).

For linearisation table speed buttons *Load*, *Save*, *Get* and *Send* and their functions see table below

Button	Function
<i>Load</i>	Loading a linearisation table from a file
<i>Save</i>	Saving a linearisation table to a file
<i>Get</i>	Loading a linearisation table from a field device
<i>Send</i>	Sending a linearisation table to a field device

5.2.4 Echo Map

The *Echo Map* tab allows access to parameter 70 as defined in the L4660 Instruction Manuals. Refer to the appropriate manual for a complete description of this parameter.

Clicking on the *Echo Map* tab reveals the blank Echo Map table (Figure 10). For viewing the Echo Map data of the relevant field device click on *Get* speed button. The data may be saved to a file by clicking the *Save* button.

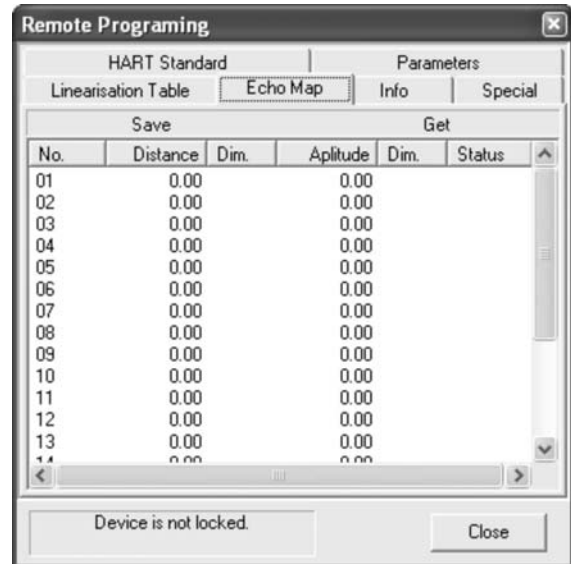


Figure 10. Echo Map Window

5.2.5 Info

The *Info* tab allows access to parameters 60 through 98 as defined in the L4660 Instruction Manuals. Refer to the appropriate manual for a complete description of these parameters.

Clicking on the *Info* tab (Figure 11) accesses the informational parameters as well as resetting of Totalizer 1 (P77) and of the Secret Code (P99). For viewing the actual information of the relevant field device, click on the *Refresh* button.

Clicking on box *Clear TOT1* will reset the aggregate value to 0.

The use of the window appearing after clicking on box *Change Password* is self-explanatory.

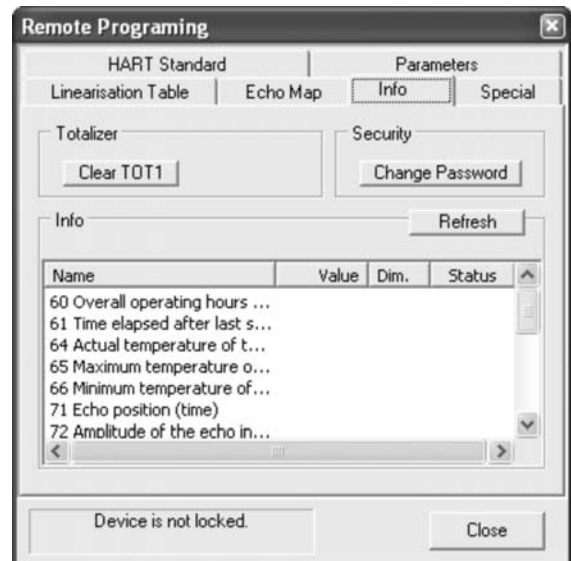


Figure 11. Info Window

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5.2.6 Special

The *Special* tab allows access to parameters 10 and 11 as defined in the L4660 Instruction Manuals. It allows the 4mA - **Lower Range (ZERO)** – and 20mA – **Upper Range (SPAN)** – points to be set relative to the actual process levels. Clicking the appropriate tab measures the actual distance to the level and sets that as the 4 or 20mA point. Refer to the appropriate manual for a complete description of these parameters.

5.2.7 Measuring

Measurement results can be accessed in the Main window (Figure 5). Let the device(s) be identified by clicking on the speed button *Detect* or pressing key F5. If detection is successful, node list of all field devices will appear in the Main window.

Each device has a measurement window for viewing the main data of the measurement (Figure 13). Placing a check mark in the box at the left end of the node list (see Figure 5) will result in the measurement window appearing on the screen. Clicking speed button *Poll* will result in cyclical polling of the measurement data from the chosen device being displayed in the *Measurement Window*. Choosing *Log* under *View* on the *Menu Bar* will result in a time log of communication queries appearing on the display.



Figure 12. Special Window

Number on Fig. 13	Explanation
1	Analog signal with bargraph
2	Level measured (LEV) with bargraph
3	Button for switch over between TOT1 and TOT2 in operation mode FLOW
4	Operation mode selected
5	Relay status (4-wire units only)
6	Place for warning of <i>Pt Error</i>
7	Measured value

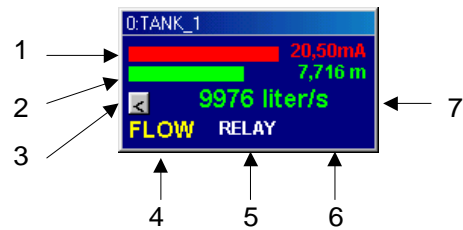


Figure 13. Measurement Window