MACTek® Corporation

USB HART$^{\text{Ò}}$ Interface

Users' Manual

LIMITED WARRANTY
VIATOR® **Interface for HART**

MACTek Corporation warrants this Interface and all of its component against defects in materials or workmanship for a period of one year from the date of purchase. This warranty only extends to the original consumer of this product.

If the Interface or a component does not function because of defects in material or workmanship during the warranty period, *MACTek* will either repair the defective product or replace it with a new or remanufactured functionally equivalent product of equal value. The original consumer must send proof of purchase along with the defective product as provided below. To obtain service under this warranty, first call the *MACTek* Support Center to obtain a Return Merchandise Authorization (RMA) number from *MACTek*; then deliver the product, shipment pre-paid, to *MACTek* addressed as follows:

> *MACTek Engineering Dept.*
> Attn: RMA # _____
> 2112 Case Parkway South
> Twinsburg, OH 44087
> USA

Call the *MACTek* Support Center at (216) 283-2010 to obtain an RMA number, or for further product or service information under this warranty.

MACTek has no obligation to repair or replace any defective product that has been subject to misuse, neglect, accident, or abuse, or subject to alteration or repair by persons other than *MACTek* or its authorized repair agents. This warranty does not cover normal wear and tear.

REPAIR OR REPLACEMENT AS PROVIDED UNDER THIS WARRANTY IS THE SOLE AND EXCLUSIVE REMEDY OF THE CONSUMER. *MACTek* SHALL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES OR FOR BREACH OF ANY EXPRESS OR IMPLIED WARRANTY ON THIS PRODUCT. EXCEPT TO THE EXTENT PROHIBITED BY APPLICABLE LAW, *MACTek* SPECIFICALLY DISCLAIMS ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Some state or countries do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. In addition, some states or countries do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation may not apply to you.

This warranty gives you specific legal rights, you may also have other rights which vary from state to state and country to country.

No terms in any purchase order or other sales agreement shall alter or replace the terms contained in this Limited Warranty

VIATOR USB HART Interface

Overview

Congratulations on purchasing the VIATOR USB HART Interface. The Interface allows you to communicate with HART instruments using a personal computer, the computer's USB port, and HART communication software.

The Interface operates on low power, is isolated, and fully HART compliant. It draws power from the USB port and requires no external power supply. The Interface operates on as little as 30 mA of USB supplied power, well within the capabilities of all PCs. The Interface adheres to the USB 2.0 standard. The VIATOR USB HART Interface Software Driver included on the VIATOR Interface Installation CD provides the link between the USB port and the HART communication software, by generating a virtual communications port.

The Interface is enclosed in a small, rugged plastic case, suitable for the industrial environment. You connect the interface to your computer with a short integral cable terminating in a USB A connector, and connect to field devices with an integral 6 foot cable terminating in two Minigrabber® test clips.

For the most recent version of this document, go to the MACTek web site http://www.mactekcorp.com/

Getting Started

Hardware and Software Requirements:

- VIATOR USB HART Interface, Model 010031
- Computer with one or more USB ports
- Windows operating system software:
  - Windows 98 second edition
  - Windows ME
  - Windows 2000
  - Windows XP
- VIATOR Interface Installation CD with VIATOR USB HART Interface Software Driver, software utilities and documentation
- HART application software for communication with HART instruments

HART Communication Software

HART communication software must be capable of recognizing virtual Com ports to work with the Interface,

DOS and Windows NT based applications do not recognize USB virtual com ports and are therefore not supported.

Check Your VIATOR USB HART Interface Package:

Your Interface package contains the following items:

- VIATOR USB HART Interface
- VIATOR Interface Installation CD

If any of these items is missing or damaged, please contact MACTek Corporation.

Connecting to a HART Device

The Interface has an integral USB cable with a male A plug for connection to the computer and an integral, 6-foot cable with two test clips.

The Interface connection to the HART network is transformer-isolated and polarity-insensitive. Transformer isolation allows you to connect the Interface across the load-resistor or across the HART device. Polarity insensitivity means that you may attach either test clip to either side of the HART device or load Resistor.
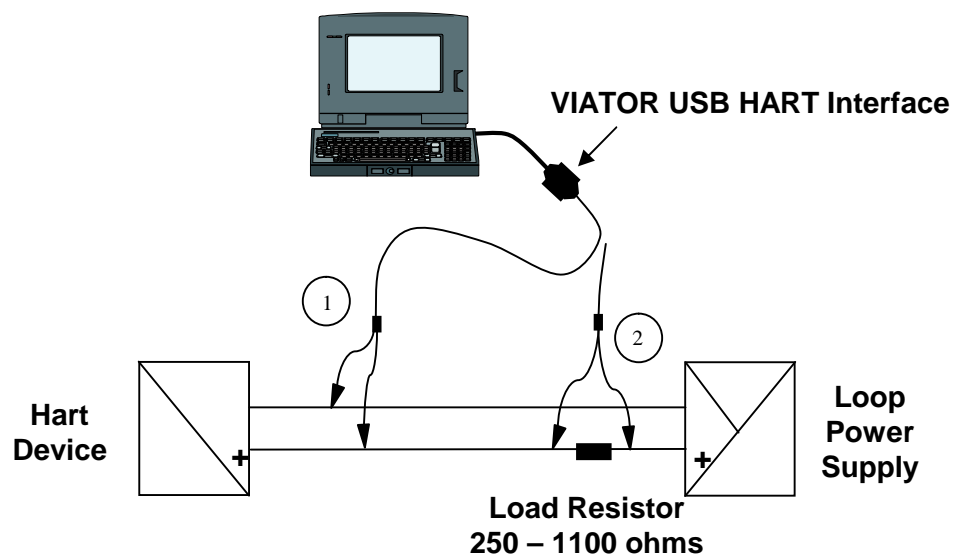
Connect the test clips   (1) across the HART device, or
                                (2) across the load resistor.

Do not connect the Interface across the power supply. You will not damage the Interface, but communication with the HART device cannot occur.

Standby and Hibernate Power Saving Modes

The VIATOR USB Interface driver supports all portable computer power saving modes. However, interruption of HART communication software by a Standby or Hibernate mode may necessitate restarting that HART communication software to continue HART communications.
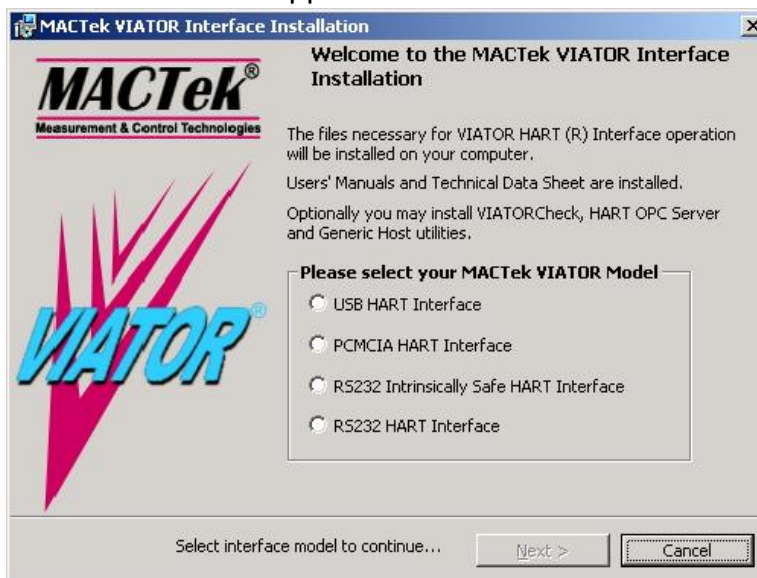
Software First Installation
### *(Inserting CD before plugging in VIATOR Interface - Recomended)*

Inserting the VIATOR Interface Installation CD into the PC's CD drive will automatically start the installation of the MACTek driver (viator.sys) and information (viator.inf) files. Screens will appear, prompting the user to install documentation, test utilities and HART communications software. All documentation and utilities are optionally installed. Only the MACTek drivers are necessary for the proper operation of the VIATOR USB HART Interface.

1) Insert the VIATOR Interface Installation CD into your PC's CD drive. The preliminary screen will appear:
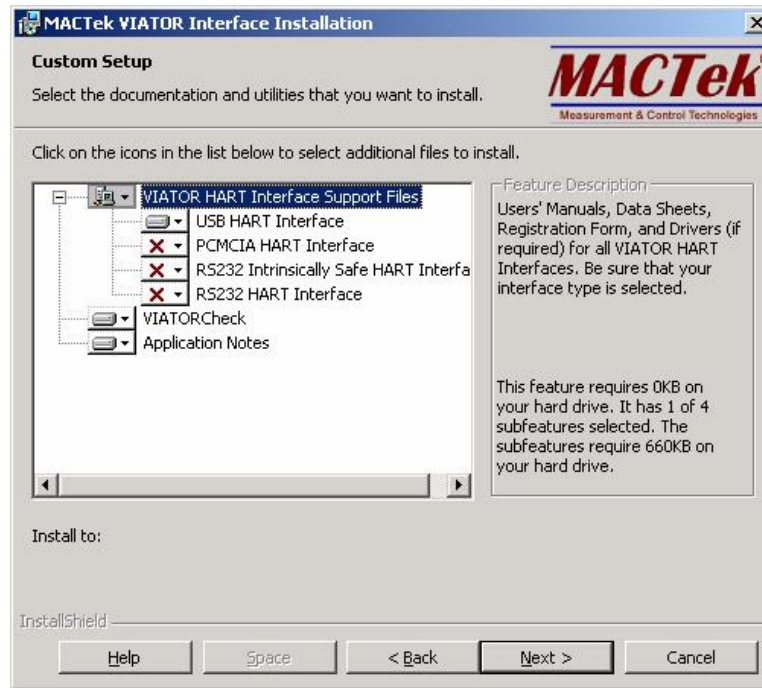
Then a Welcome window will appear:


Select the USB HART Interface:
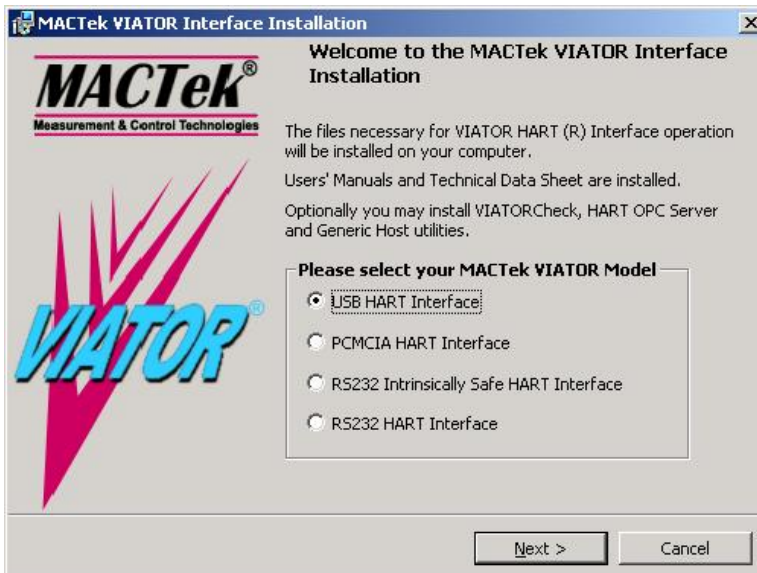
Click **Next>**

The Custom Setup screen will appear. Installation of the VIATOR USB Interface documentation, drivers, and utility software will be the default condition.


Highlighting an item will display its description and size in the area to the right of the item list. Clicking on the icons will present the option of installing (default) or not installing that item. The USB HART Interface must be selected for the drivers to be installed.

The following screen will be displayed while files are copied:
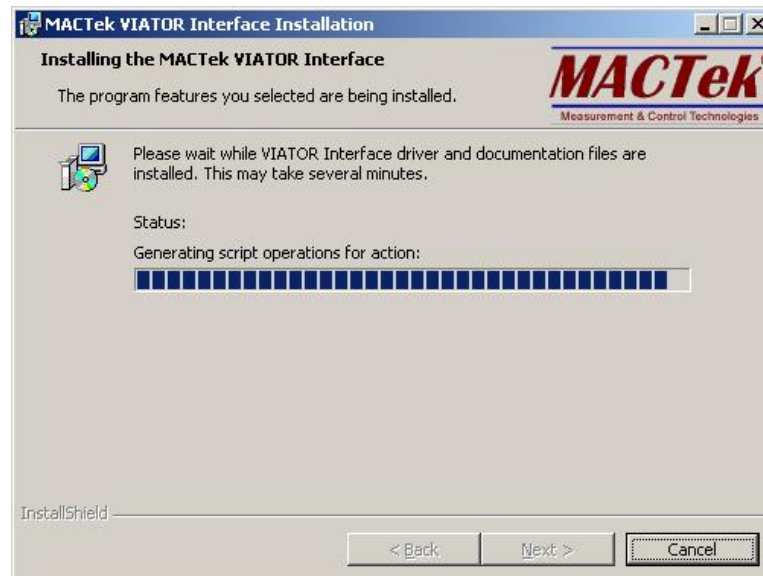
MACTek in agreement with the HART Communications Foundation (HCF) provides a 30 day evaluation copy of the HART OPC Server. Clicking on the pushbutton will install this software. The Generic Host is also from HCF and must have the HART OPC Server installed to function.

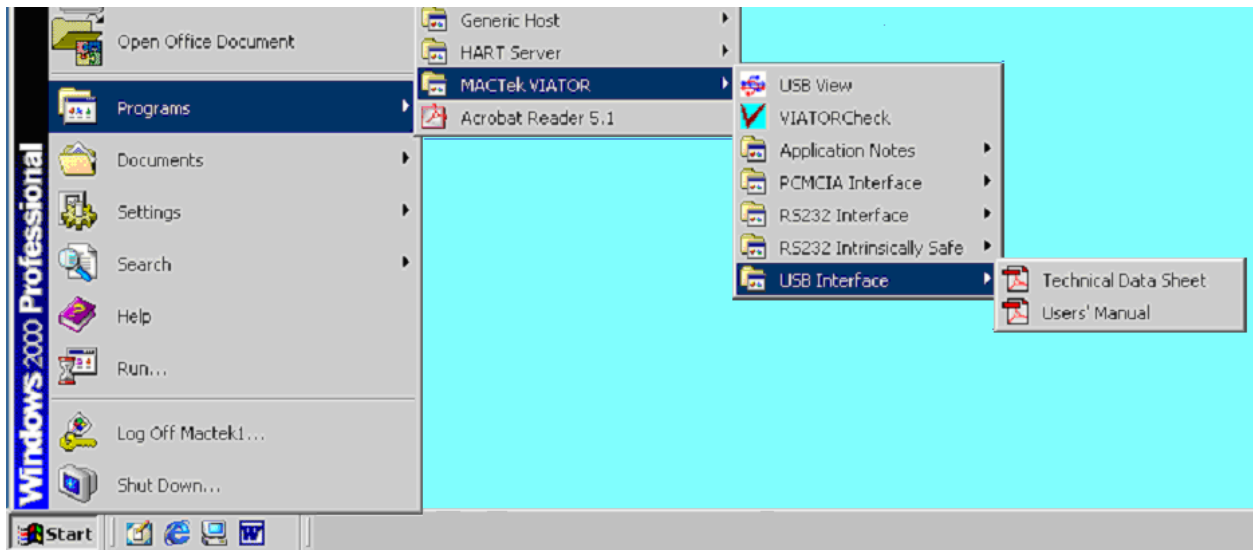Adobe Reader is necessary to read the documentation copied to the PC's hard drive.
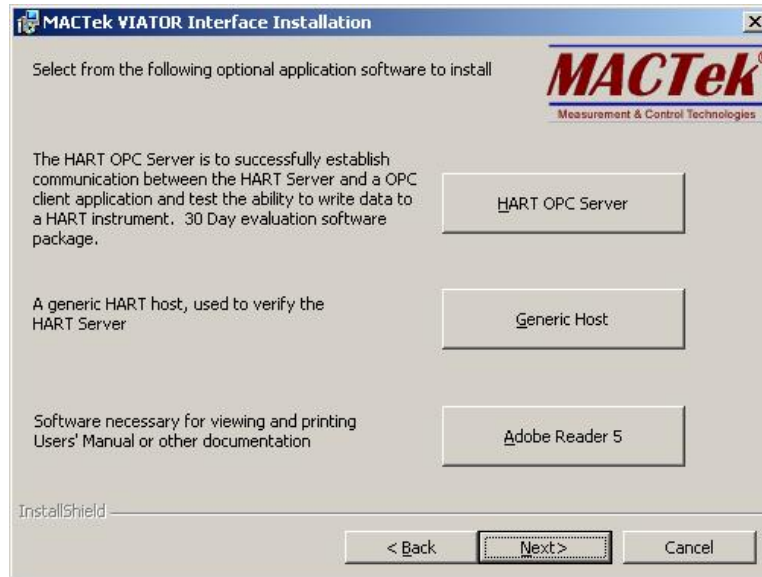
The final screen is:
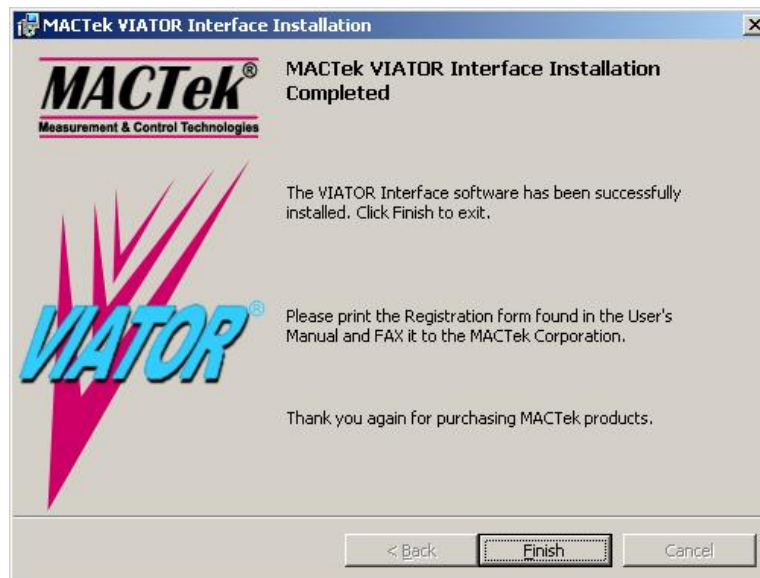
Please complete and FAX the Registration form found at the back of this manual.

Shortcuts to the VIATOR Interface documentation are automatically generated by the Installation CD.

VIATORCheck

VIATORCheck is a utility to help ensure that the VIATOR Interface hardware and driver are correctly installed
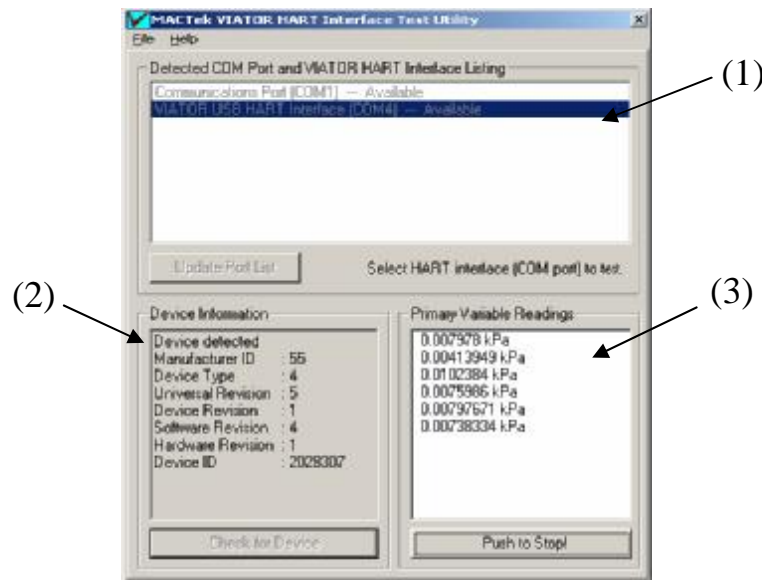
After connecting a HART Device (page 3: ***Connecting to a HART Device)***, start VIATORCheck and the VIATOR Interface will be listed in the top window (1). Clicking on "Check for Device" causes the device to be questioned and its information in to be displayed in window (2). Clicking on "Read Primary Variable" reads and displays the device's primary variable in window (3).

Hardware Wizard Installation
(plugging in VIATOR Interface before inserting CD)
Not Recommended. Please Follow Software First Installation.

The MACTek driver (viator.sys) and information file (viator.inf) are required for the proper operation of the Interface. They are installed automatically by the Hardware Wizard if the USB Interface is plugged into your PC before the installation CD has been inserted into the CD drive.

1) Plug in the Interface's USB A connector into your PC's USB socket (either socket if more than one is available) or USB hub.

2) The PC will detect and determine that a new USB device has been connected. You will be prompted by pop-up windows to insert the VIATOR Interface Installation CD.

Example pop-up windows for Windows 2000 follows. The pop-up windows for Windows 98, ME, and XP will differ only slightly from these.

> 2a) Plug in the Interface's USB cable into the host PC. The following windows will appear:

2b) Click **Next>**

2c) Click **Next>**

2d) Make sure that only the "CD-ROM drives", is checked,
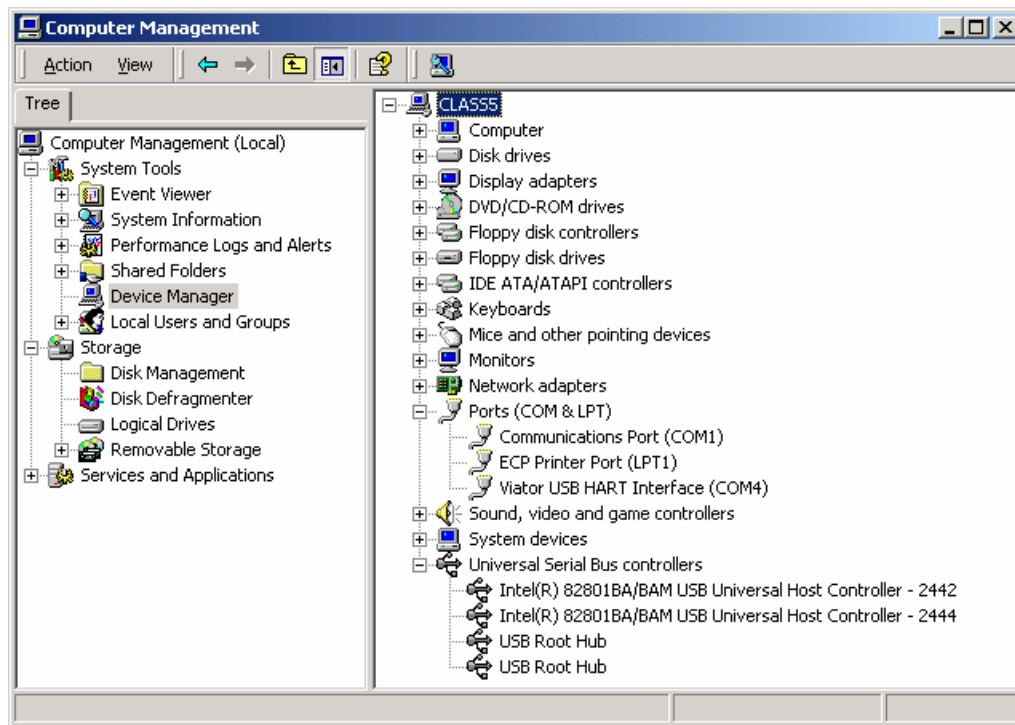
   Click **Next>**

2e) Click **Next>**

2f) Click **Finish**

The virtual communications port that has been assigned to the Interface can be determined by viewing the Ports listing in Device Manager, as follows:

The assigned COM number (in this example COM4) may be different between each host PC and can depend upon which USB socket the Interface is plugged into.

Technical Specifications

Electrical Specifications:

Power Supply:	No external supply required. Interface is powered via the USB port.
Supply Current:	5V @ 30mA
Connections:	
Computer	Industry standard IBM-PC compatible USB A connector (see Table II.1).
HART	Two Mini-grabber test clips.
Output Level:	Fully HART compliant. 0.5 +/- .1Vpp trapezoidal wave @1200/2200 Hz.
Isolation Certification:	1500VDC isolation between instrument & computer.

Software Requirements:

Operating System:	Windows 98 (second edition), Windows ME, Windows 2000, and Windows XP (Windows NT is *not* supported as NT does not support USB)

HART Cable:

Cable:	Jacketed, twisted pair wire about 4.5 ft long, split into two independent test leads 1.5 ft long.
Connection	Mini-grabber test clips, with polarity insensitive termination.

USB Cable:

Cable:	Jacketed, Power 24AWG, Signal 28AWG twisted, Double shielded, 1 ft long.
Connector	USB A Male

Environmental Specifications:

Temperature:	Operating: 0° C to 50° C (32° F to 122° F)
	Storage: -40° C to 85° C (-40° F to 185° F)
Humidity:	0% to 95% relative humidity (non-condensing).

Physical Dimensions:

Enclosure	51 x 33 x 15 mm
	ABS enclosure suitable for industrial use.

FCC Class A

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CE Compliance, Emissions and Immunity:

The Equipment complies with the Emissions and Immunity requirements given in the EMC Directive 89/336/EEC. The VIATOR Interface was found it to be in compliance with the EMC standards:

         Emissions: EN 61326-1/1997
         Immunity: EN 61326-1/1997
                      EN 61326-1/A1/1998

USB Pin Connections

	Pin #	Description
Data D+	3	Differential full speed USB data at 12MHz, normally high
Data D-	2	Differential full speed USB data at 12MHz, normally low
VBUS	1	5V
GND	4	Ground

CUSTOMER REGISTRATION FAXBACK FORM

Dear VIATOR® Interface Customer:

To register your product, please provide the information requested below and fax this registration form to *MACTek Corporation* at (216) 283-2009. This information will enable us to serve you better with timely distribution of product updates and new product information.

Sincerely,
MACTek Corporation

TO: Customer Registration, *MACTek Corporation*
PHONE: (216) 283-2010
FAX: (216) 283-2009
EMAIL: tholmes@mactekcorp.com

NAME:

E-MAIL:

COMPANY:

STREET:

CITY: STATE: ____   ZIP: _____

COUNTRY:

PHONE: FAX:

DATE OF PURCHASE:

PURCHASED: VIATOR USB HART Interface   _____
               VIATOR RS232 HART Interface   _____
               VIATOR RS232 HART Reference Interface _____
               VIATOR RS232 HART [EEx ia] IIC Interface _____
               VIATOR PCMCIA HART Interface   _____

PURCHASED FROM WHOM?

COMMENTS:

VIATOR® and *MACTek*Ò are Trademarks of *MACTek Corporation*,
registered in the U.S. Patent and Trademark Office.

MACTek®

Measurement and Control Technologies