

NORTHROP GRUMMAN
Commercial Information Services
3910 Sorrento Valley Boulevard, Suite A
San Diego, CA 92121
1-800-453-0661

VersaProbe™

Meter Reader

USER'S GUIDE

July 18, 2002

TABLE OF CONTENTS

<u>TITLE</u>	<u>PAGE</u>
1.0 VersaProbe™ Environmental Considerations	3
2.0 VersaProbe™ Operations.....	3
3.0 Selecting VersaProbe™ Encoder Protocols.....	4
4.0 AutoSense Mode Selection	6
5.0 Reading Meters with the VersaProbe™	7
5.1 The Reading Procedure.....	7
5.2 Stored Readings.....	8
6.0 Recharging the VersaProbe™ Battery Pack.....	10
7.0 Sensus SmartGun™ Emulation Mode	10

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications to the VersaProbe not expressly approved by Northrop Grumman could void the user's authority to operate the equipment as a Class B device under Part 15 of the FCC rules.

1.0 VersaProbe™ Environmental Considerations

The VersaProbe is designed to operate from -20 to +50 deg C (0-130 deg F), but note that the display may be darker than normal at high temperatures and that the display response may be slower than normal at low temperatures. These changes in display characteristics are normal.

Caution: Reasonable care should be taken not to subject the VersaProbe to Electrostatic Discharge (ESD). While normal human-body ESD will not cause physical damage to the VersaProbe, it may cause the probe to switch operating modes or change configuration parameters. When no communication or charging cable is attached to the VersaProbe's connector, the supplied cap should be attached to the connector to prevent accidental discharge from reaching the connector contacts.

2.0 VersaProbe™ Operations

The VersaProbe is designed for the sole purpose of reading commercially-available direct-connect and inductively coupled utility meter register/encoders. The VersaProbe will display the ID and reading of the register on its built-in LCD display and optionally record and/or transmit the data to an external device via an RS-232 data cable. During normal use a VersaProbe operator can perform six primary functions:

1. Select a register/encoder protocol manually.
2. Change between AutoSense and manual modes.
3. Read a meter register/encoder.
4. Transfer collected data from the VersaProbe to an external device.
5. Recharge the VersaProbe battery pack.
6. Enable or disable internal data storage.

Each of the first three functions is initiated solely by the operator pressing the trigger button, as will be described later. The last three functions require connection of a data cable or recharging cable to the VersaProbe.

Shielded cables are not required for use with the VersaProbe, but any cable connected to the VersaTerm must be less than 2 meters in length to ensure compliance with Part 15 of the FCC rules for Class B devices.

3.0 Selecting VersaProbe™ Encoder Protocols

The VersaProbe is capable of reading data from different types of encoder using their respective data transfer protocols. The list of register type protocols include:

1. Master Meter (or Badger) Dialog protocol for single encoders connected to a single meter (not on a network)
2. Master Meter (or Badger) Dialog protocol for multiple encoders connected to multiple meters on a network.
3. Schlumberger ProRead ARB-6 (ProRead) protocol.
4. ABB Water Meters (Kent) ScanCoder protocol.
5. Sensus (Invensys) TouchRead protocol.
6. Schlumberger (Neptune) ARB-1 through ARB-5
7. Hexagram protocol (includes Hersey Touchless)
8. Fusion (SystemEquity) protocol
9. GWF (IEC 1107) protocol
10. CICASA Scanpro protocol

11-15 Reserved for future expansion

To select a protocol using the VersaProbe, press and hold the trigger button. If AutoSense is not enabled, the VersaProbe display will initially (for the first second that the trigger button is held down) look something like the example below. DIALOG indicates the current protocol selection. The dash (–) indicates that data storage is turned off, and the 100 indicates that 100% of the VersaProbe's internal memory is empty (available for storage of meter readings).

-100 DIALOG

If AutoSense is enabled the display may initially look something like this instead, where the added A indicates that AutoSense is active. Also in this example the + indicates that data storage is turned on and the 091 indicates that 91% of the data storage memory is still empty (available).

+091 A DIALOG

After the trigger button is held pressed for more than one second, asterisks will begin to appear on the display, from left to right, in the second line of the display. The display screen will look something like this:

```
-100  DIALOG
****  _____
```

If the trigger button is released at any time before the asterisks completely fill the second line of the display, the VersaProbe will begin reading using the currently-selected communication protocol. If the trigger button is held pressed until asterisks have filled the entire second line of the display (about four seconds total), the VersaProbe screen will change to will show a list of its enabled protocols. The screen will look something like this:

```
0 - 2 3 4 - - 7 -9A-----
RELEASE BUTTON
```

This protocol list screen will remain displayed for as long as the trigger button is held pressed. The numbers and letters in this display indicate which protocols that this VersaProbe has been configured to use. The letters A through F are used to indicate protocols 10 through 15 respectively and the digit 0 is used to indicate that AutoSense control is available (i.e. AutoSense was not locked on or off during configuration). The dashes indicate protocols (and/or AutoSense control) that have been disabled. In this example AutoSense control is available, and Dialog Network, ProRead, ABB, Hexagram, GWF and Scanpro protocols are available.

The VersaProbe's trigger should be released at this time. After the trigger is released the VersaProbe will begin to display the available protocols for operator selection, one at a time, at approximately one-second intervals. The display screen will look something like this for any given protocol display:

```
P4          ABB
PRESS TO SELECT
```

Each protocol will remain on the screen for approximately one second. After that time the next available protocol will be displayed, which in this example will be P7 HEXAGRAM. This

process will repeatedly cycle through the list of available protocols for about 30 seconds, or until the trigger is pressed to select the protocol being displayed. If no selection is made within 30 seconds, the selection display will stop cycling and the current protocol will remain unchanged.

To make a protocol selection, press and release the VersaProbe trigger when the desired protocol number is displayed. For example, to select the Dialog Network protocol, wait until the display shows “P2 DLOG NET”, then quickly press and release the VersaProbe trigger. The VersaProbe is now ready to read Dialog Network. The VersaProbe will acknowledge the change with a display similar to the following:

P2 DLOG NET SELECTED

4.0 AutoSense Mode Selection

Note: This section is not applicable if AutoSense has been locked in the “ON” or “OFF” state during configuration, or if only one protocol is available.

When AutoSense is off, it can be turned on in the same manner that a meter protocol is selected (reference Section 2). Press and hold the VersaProbe trigger for approximately four (4) seconds.

At the end of the four-second period, the VersaProbe display will change, showing the protocols that are available to be read. Release the trigger. Each enabled protocol will now be displayed one at a time for approximately one (1) second. After the last enabled protocol has been displayed, and before the first enabled protocol is displayed, this screen will appear:

P0 AUTO ON PRESS TO SELECT

To turn AutoSense ON, press and release the trigger while this screen is being displayed. The VersaProbe will acknowledge the change with a display similar to the following:

P4 AUTO DLOG NET SELECTED

When attempting to read a meter, the AutoSense sequence always starts with the last protocol successfully read. This helps to minimize read time on routes where there is a concentration of one specific meter type.

Protocols that are never used on any given route can be disabled during configuration; either using a VersaTerm hand-held computer in the field, or requesting that NORTHROP GRUMMAN disable certain protocols while the VersaProbe is at our manufacturing/repair facilities. Fewer protocols means faster AutoSense time. Protocols can be re-enabled in the same manner if they are needed at some future date. Call Customer Support at 1-800-453-0661 if you need assistance.

When AutoSense is on, it can be turned off in the same manner that it is turned on (as described above). Press and hold the VersaProbe trigger for approximately four (4) seconds. After the last enabled protocol has been displayed this screen will appear:

P0	AUTO OFF
PRESS TO SELECT	

To turn AutoSense OFF, press and release the trigger while this screen is showing. The VersaProbe will acknowledge the change with a display similar to the following:

P4	DLOG NET
SELECTED	

5.0 Reading Meters With the VersaProbe™

5.1 The Reading Procedure

Once the desired protocol is selected in the VersaProbe, simply hold the VersaProbe up to the meter, press the trigger button, and then release it within less than four seconds.

Notice the display while briefly holding the trigger button pressed:

-100	DIALOG
------	--------

After the trigger is released, the screen will appear as shown:

READING DIALOG

This indicates that the VersaProbe is in the process of reading the meter. For networks and compound registers the display will also show a sequence number or character to indicate which unit is being read, for example:

READING DLOG NET NETWORK NODE 1

After a read process completes (which includes reading all registers in compound meter or network), the ID and READING of the first register are displayed on the VersaProbe screen for several seconds if the VersaProbe is not in communication with a local route computer. If the VersaTerm is in communication with a local route computer, then all acquired register data will be immediately transferred to that computer and the last ID and READING transferred are displayed on the VersaProbe screen. The VersaProbe can be removed from the meter at this time. For a register with an ID of 1234567890 and reading of 654321, the display screen will look something like this:

ID	1234567890
RDG	654321

When the VersaTerm is not connected to a local route computer, the data for additional registers in a network or compound installation can be displayed by quickly pressing and releasing the trigger button again before the display time expires. The ID and reading data will be displayed in the order that they were collected. After all available data has been displayed, a row of dashes will appear across the screen to signify that no more data is available.

5.2 Stored Readings

Note: This section is not applicable to users with memory locked in the “OFF” position.

The VersaProbe has an internal memory, which, if turned ON, allows readings to be stored internally when no route computer is attached. Depending upon the mix of meter types being read, the VersaProbe memory will hold between 500 and 1100 register readings. You can determine the remaining memory capacity by observing the VersaProbe display when the trigger is initially pressed. The memory remaining is 83% in the screen sample below:

+083	DIALOG
------	--------

With no readings stored, the display will show 100%. If the display reads 000, memory is full and the VersaProbe cannot collect any additional readings.

To unload stored readings into NORTHROP GRUMMAN's VersaTerm hand-held, connect the VersaProbe to the VersaTerm and readings will be transferred and inserted into the correct accounts based upon a Meter ID search. **Other hand-helds may or may not support the "stored reading" function. Consult with your hand-held vendor before attempting to take readings without the hand-held attached to the VersaProbe.**

To turn memory ON or OFF, connect the VersaProbe to the battery charger. The VersaProbe model, serial number, firmware version, and memory status are displayed during the first three seconds of charging. For example:

VP1X-10126	MEM
V10.07	ON

To change the memory status from OFF to ON or vice versa, simply press and release the trigger while this screen is displayed. After memory has been turned off the display will look like this:

VP1X-10126	MEM
V10.07	OFF

If memory is accidentally turned ON when not needed and the VersaProbe stops collecting readings because memory is full, follow the above procedure for turning memory OFF. Once memory is OFF, press and release the trigger. The VersaProbe will attempt (and fail) a read process, then display an error message indicating no meter was detected. When the error message disappears and the screen goes blank, memory will be emptied and reading capability will be restored.

6.0 Recharging the VersaProbe™ Battery Pack

It is good practice to keep the batteries charged and in good condition. Immediately after connecting the VersaProbe to a wall charger, the display will show the VersaProbe's serial and memory status. The display screen will look something like this:

VP1X-10126	MEM
V10.07	ON

After three seconds, the VersaProbe will display the accumulated charging time in hours, minutes and seconds. The display screen will look something like this:

AC CHARGE
01 23 45.0

In this example, the VersaProbe has been charging for 1 hour, 23 minutes and 45 seconds.

Generally, VersaProbe batteries should be charged every evening after a full day's usage. If the probe has only been used for a short time, it is probably not necessary to charge the battery that evening. Leaving the battery on charge for long periods of time will significantly reduce battery life. NORTHROP GRUMMAN recommends limiting charging periods to over-night (15 hours) whenever possible, but over a weekend is acceptable once per week.

7.0 Sensus SmartGun™ Emulation Mode

The VersaProbe serial output data format can be configured to emulate a Sensus SmartGun's data format. In this mode the VersaProbe's output data is always in the variable record length format regardless of the actual data format of the register that was read. Data from a MultiRead register multiplexer is presented as multiple independent variable-format data records. The default emulation mode operates at 300 baud but an optional 9600 baud mode is also offered. When a VersaProbe is configured for emulation mode, the firmware version number display is altered accordingly. In the 300 baud emulation mode, -3 is appended to the version number, while in the 9600 baud emulation mode -96 is appended to the version number. An example is shown below. **SmartGun™** is a trademark of Invensys plc.

VP1X-10126	MEM
V10.07-3	ON