UNICOM™ III Probe

PG42-1008C
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1 Introduction

The UNICOM III probe is a portable optical [infrared] communications device that transfers digital information between Elster electronic meters, EMF registers, and other reader/programmer equipment. Two basic configurations of probes are available: one is compatible with the mechanical and optical specifications of the ANSI C12.18 standard and the other is compatible with the IEC–1107 FLAG port.

Elster offers the standard DB-9 serial connector or a USB (universal serial bus) connector as well as connectors for third party hardware such as DAP MICROFLEX (LEMO), Itron FS/2 and FS/3 (AMPHENOL), and Itron G5 (HIROSE). Contact Elster for details.

Elster's UNICOM III probe supports up to 57,600 bps communication with electricity meters equipped with ANSI C12.18 or IEC 61107 FLAG–compliant optical ports. The UNICOM III probe does not use a battery pack, special power connector, or AC adapter. Its state–of–the–art circuits are powered directly from the computer's RS-232 DB-9 serial port, USB port, or other third party hardware port.

The UNICOM III probe has the following additional features:

- operates over wide temperature range -40 °C to +85 °C
- uses a sunlight filter to enhance infrared (IR) communications in bright sunlight
- probe molded from lightweight, durable polycarbonate plastic
- cable jacket molded from high–endurance polyurethane
- equipped with a super powerful rare earth retention magnet for attaching to a metal port plate on a meter
- equipped with a removable retention spring for attaching to the plastic port under the cover of an Elster meter
- optional optical port adapter available for using ANSI style probes with IEC 61107 FLAG–compliant meters
- RS-232 models support true RS-232 ± electrical signal levels
- USB models support USB 1.1 and USB 2.0 standards

Common optical probe styles

The following table lists the most common Elster probe styles.

<table>
<thead>
<tr>
<th>ANSI probes (connector type)</th>
<th>Style number</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 ft (3 m) retractile coil cable (DB-9)</td>
<td>5D25274G01</td>
</tr>
<tr>
<td>6 ft (2 m) retractile coil cable (DB-9)</td>
<td>5D25274G02</td>
</tr>
<tr>
<td>10 ft (3 m) retractile coil cable with calibration pulse output via RCA connector NPN Transistor rated 15 mA Max (DB-9)</td>
<td>5D25274G96</td>
</tr>
<tr>
<td>Adapter for ANSI probes to accommodate IEC 61107 FLAG port</td>
<td>3A34485G01</td>
</tr>
<tr>
<td>6 ft (2 m) straight cable (USB)</td>
<td>5D25334G01</td>
</tr>
</tbody>
</table>

Note: Other configurations are available, including probes with different connectors (such as LEMO, AMPHENOL, and HIROSE) and cables.
Introduction

1. Introduction

Probes for ANSI Type 1 port

The patented optical communications technology used for certain EMF electronic registers (Westinghouse and ABB Types EMF-1A, EMF-1B, EMF-2, and EMF-2110) have a Type 1 communications port. Consult Elster Sales Support for availability of the Type 1-compliant probe.

Supported software

The UNICOM III probe has been tested and works with the following Elster meter support software products:

<table>
<thead>
<tr>
<th>Meter Support Software</th>
<th>Meters</th>
</tr>
</thead>
<tbody>
<tr>
<td>AlphaPlus™ 1.30 or higher</td>
<td>ALPHA®, ALPHA Plus®, and AIN ALPHA meters</td>
</tr>
<tr>
<td>(domestic and international)</td>
<td></td>
</tr>
<tr>
<td>Metercat™ meter support software</td>
<td>A3 ALPHA meters, A1800 ALPHA meters, REX™</td>
</tr>
<tr>
<td></td>
<td>and REX2 meters</td>
</tr>
<tr>
<td>A1200 ALPHA Meter Support Software</td>
<td>A1200 ALPHA meters</td>
</tr>
</tbody>
</table>

Note: For UNICOM III probes with the standard DB-9 connector, the meter support software must turn on either the RTS or DTR RS-232 signal prior to initiating communications. This is the source of power for the probe. Do not turn on both control signals as this signals the probe to support a variant to the standard protocol that inverts the digital logic of the Tx LED.

The UNICOM III probe also supports meters (for example, certain meters from Landis+Gyr) that use a variant to the ANSI C12.18 Tx signal. To communicate with these meters, the meter support software uses RTS to signal the probe to turn on and DTR to signal the probe to invert the Tx digital logic for the optical signal. In this situation only, both RTS and DTR should be turned on.

For probes with special connectors for third party hardware, the Tx digital logic is inverted when DTR is asserted regardless of the state of RTS. These probes are directly powered by the third party hardware power supply.

The UNICOM III probe has an internal wire jumper between DTR and DCD. This connection is the probe signature. Some meter support software use this jumper to determine which COM port has the connected probe. Also, the UNICOM III probe asserts the DSR signal which some meter support software uses to determine that the probe is powered.

Note: To aid in development of custom applications, the UNICOM III probe equipped with the standard DB-9 connector may be powered by applying a 5-15 VDC source at Pin 9.

Connecting the probe to a computer

A UNICOM III probe can be purchased that supports a variety of connection types. The standard probe has a DB-9 serial connector that fits on a computer’s serial port. If the computer uses Windows 2000/XP and has a USB port, you can use a USB-to-serial adapter or you can purchase the UNICOM III probe for USB connections. Depending on the type of connector your probe uses, install the probe using the appropriate procedure for your probe.

<table>
<thead>
<tr>
<th>IEC 61107 probes</th>
<th>Style number</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 m (10 ft) retractile coil cable (DB-9)</td>
<td>5D25274G03</td>
</tr>
<tr>
<td>2 m (6 ft) retractile coil cable (DB-9)</td>
<td>5D25274G04</td>
</tr>
<tr>
<td>2 m (6 ft) straight cable (USB)</td>
<td>5D25334G04</td>
</tr>
</tbody>
</table>

Use authorized utility procedures to read metering equipment. Dangerous voltages are present. Equipment damage, personal injury, or death can result if safety precautions are not followed.

Never use UNICOM probes in high voltage equipment compartments or where dangerous voltages may be exposed in open connections and terminals. The electrical insulation on UNICOM probes is for low voltage signaling only. Probe insulation is not designed for power line distribution or higher voltages! Equipment damage, personal injury, or death can result if these instructions are not observed and if probe or connecting cord comes into contact with high voltage terminals or bus bars.

Non-USB connector probe
To begin using the UNICOM III probe (non-USB connector), plug the connector into the appropriate COM port on your computer.

*Note: You may need to configure your software to use the correct COM port. See "Configuring support software to use the COM port" on page 29 for details.*

USB connector probe
See "Installing the USB device drivers" on page 10 for details on installing the device drivers for the UNICOM III probe with a USB connector.

Connecting the probe to a meter
Both ANSI and IEC probes are equipped with retention magnets. The magnet provides positive attachment to the various optical ports. The optical, mechanical, and magnetic interfaces between the ANSI and IEC UNICOM probes are similar. The ANSI–compliant probe may be used on both ANSI and IEC meter types provided that the orientation of the elements is correct. To operate the ANSI probe on an IEC meter the elements must be inverted 180° to properly communicate (Figure 1-2). To ensure proper orientation, Elster recommends using the IEC Adapter for ANSI optical probes. See "IEC adapter for ANSI optical probe" on page 8 for more details on the probe adapter.

ANSI optical probe
The ANSI probe uses a keyed mounting hole suitable for ANSI ports.
Figure 1-1. A3 ALPHA meter with ANSI optical probe

IEC optical probe

The IEC probe contains a flat, magnetic mounting plate. The IEC probe has the LED and phototransistor rotated 180° from the required position for the same elements in the ANSI port (see Figure 1-3).
IEC adapter for ANSI optical probe

When meters of both types are to be used in common locations, a probe adapter (see Figure 1-4) for the ANSI probe can be used to make connecting to the IEC port easier (see Figure 1-2).

The IEC adapter provides the mechanical interface between the UNICOM III ANSI probe and IEC electricity meters equipped with the IEC 61107 FLAG-compliant optical port.

The adapter's ANSI side is held in place on the probe by the probe's magnetic and spring retention features. The IEC 61107 FLAG side is equipped with a ring retention magnet that holds the probe-adapter combination in place on the IEC 61107 FLAG port of the meter.

Although the center-to-center spacing between optical elements is compatible between the ANSI CI2.18 and IEC 61107 standards, placement of the Rx and Tx elements is reversed. Therefore, when using an ANSI probe and an IEC adapter with IEC 61107 FLAG-compliant meters, attach the probe with the cable oriented up (Figure 1-2). This reverses the probe's Rx and Tx elements to match the reversed Rx and Tx elements of the IEC 61107 FLAG port of the meter.
ANSI optical probe retention spring

The ANSI probe has a retention spring (Figure 1-5) clip that allows the probe to be clipped onto an ALPHA, REX, type 3110, or type 3410 electronic register.

You are ready to communicate with a meter using Elster’s meter support software.
2 Installing the drivers

Supported software

The UNICOM III USB-connected optical probe and its device drivers have been tested and function on computers using Windows® 2000, Windows XP, Windows Vista, and Windows 7 with Elster's meter support software.

In 2011, Elster certified the UNICOM III optical probe with USB connection with Microsoft. The updated device drivers are included on the Metercat software installation CD in the \UNICOM III Probe USB drivers folder.

Installing the USB device drivers

Installing the UNICOM III probe device drivers is a two phase process:

1. Install the UNICOM III Optical Probe device driver.
2. Install the USB Serial Port device driver.

*Note: You will be guided through the processes by the New Hardware Wizard.*

The installation process depends on the operating system you have installed on your computer. Use the appropriate procedure for your operating system:

- Windows 2000
- Windows XP
- Windows 7

*Note: If you are currently using your USB port for another application (for example, HotSync Manager for Palm OS devices) you may receive a message about a conflict with an application that has a lock on the port when no hardware is connected. See “Port Conflict in Port Usage” on page 29 for details on correcting this problem.*

Windows 2000

To begin installing the device drivers:

1. Plug the USB connector of the UNICOM probe into the USB port on the computer.
2. Windows should automatically recognize the new device and display the *New Hardware Wizard* dialog (on some systems this may take some time).
   
   If Windows does not start the *New Hardware Wizard*, from the Windows Start menu, select Settings > Control Panel > Add/Remove Hardware.
3. Click Next.

The Hardware Wizard prompts you to search for the suitable driver for the Elster UNICOM III Optical Probe.

4. Select Search for a suitable driver for my device.

5. Click Next.
6. Uncheck Microsoft Windows Update (if it is checked).
7. Check Specify a location.
8. Click Next.

9. Navigate to the location of the uncompressed driver installation files.
10. Select FTDIBUS.INF in the folder where the drivers are located.
11. Click Open.
12. Click Next.

13. If you see a message that the software does not contain a digital signature, click Yes to continue with the installation.
14. Click Finish to complete the installation of the first device driver and begin installing the second device driver.

The *New Hardware Wizard* prompts you to search for the suitable driver for the USB Serial Port.

15. Select *Search for a suitable driver for my device (recommended)*.

16. Click Next.
17. Uncheck Microsoft Windows Update (if it is checked).
18. Check Specify a location.
19. Click Next.
    The New Hardware Wizard remembers the location of the previous device driver.
20. Select FTDIPORT.INF in the folder where the drivers are located.
21. Click Open.

22. Click Next.
23. If you see a message that the software does not contain a digital signature, click Yes to continue with the installation.

24. Click Finish to complete the installation of the UNICOM III USB Optical Probe device drivers.

You are now ready to begin using the optical probe. See "Configuring support software to use the COM port" on page 29 for details on configuring the software to use the correct COM port.

Windows XP

To begin installing the device drivers:

1. Plug the USB connector of the UNICOM probe into the USB port on the computer.
Windows should automatically recognize the new device and display the *New Hardware Wizard* dialog (it may take up to a minute on some systems).

The *New Hardware Wizard* prompts you to search for the suitable driver for the UNICOM III Optical Probe.

2. Select *No, not this time*.
3. Click *Next*.

*Figure 2-18.*

*Figure 2-19. Begin the driver installation*
4. Select Install from a list or specific location to proceed with the installation of the probe drivers.
5. Click Next.

Figure 2-20. Search for the suitable driver

6. Select Search for the best driver in these locations.
7. Depending on the location of the device drivers, select the appropriate option:
   - If you have the Metercat installation CD, check the Search removable media.
   - Or —
   - If the Metercat installation files are on a network, check Include this location in the search and browse to the location of the installation files and select the UNICOM III Probe USB drivers folder.
8. Click Next.

   If you selected the CD option, the wizard will search the removable media for the drivers.

   If you selected a location, the wizard will search the location specified for the driver.

   The wizard should then load the files and complete installation.
9. Click Finish to complete the installation of the first device driver and begin installing the second device driver. The New Hardware Wizard prompts you to search for the software for the USB Optical Probe.
10. Select Install from a list or specific location to proceed with the installation of the probe drivers.

11. Click Next.

Figure 2-23. Locating the driver files

12. Select Search for the best driver in these locations.

13. Depending on the location of the device drivers, select the appropriate option:
   - If you have the Metercat installation CD, check the Search removable media.
   - Or —
   - If the Metercat installation files are on a network, check Include this location in the search and browse to the location of the installation files and select the UNICOM III Probe USB drivers folder.

14. Click Next.

   If you selected the CD option, the wizard will search the removable media for the drivers.

   If you selected a location, the wizard will search the location specified for the driver.

   The wizard should then load the files and complete installation.
15. Click Finish to complete the installation of the UNICOM III USB Optical Probe device drivers.
   Once the second set of drivers has been installed, you must restart your computer before using the probe.

16. From the Windows Start menu, select Shut Down > Restart.
   You are now ready to begin using the optical probe.
   See “Configuring support software to use the COM port” on page 29 for details on configuring the software to use the correct COM port.

**Windows 7**

To begin installing the device drivers:

1. Plug the USB connector of the UNICOM probe into the USB port on the computer.
   Windows should automatically recognize the new device and display the New Hardware Wizard dialog (it may take up to a minute on some systems).
The New Hardware Wizard prompts you to search for the suitable driver for the UNICOM III Optical Probe.

Figure 2-26.

2. Click Close.
3. To install the drivers manually, from the Windows Start menu, select Control Panel > System.
4. Select the Hardware tab.
5. Click Device Manager.
6. From the Other devices tree, double click to open Elster Unicom III Optical Probe. The Elster Unicom III Optical Probe Properties dialog displays.

Figure 2-27. Begin the driver installation

7. Click Update Driver.
8. If the computer has an internet connection, select Search automatically for updated driver software and Windows Update installs the proper drivers.

— Or —

Select Browse my computer for driver software and browse to the location of the Metercat installation CD or the installation files and select the \UNICOM III Probe USB drivers folder.

9. Click Close to complete the installation of the UNICOM III USB Optical Probe device drivers.

10. From the Windows Start menu, select Shut Down > Restart.

You are now ready to begin using the optical probe.
Upgrading the UNICOM III Probe device drivers

To begin installing the device drivers:

1. Plug the USB connector of the UNICOM probe into the USB port on the computer.
2. To upgrade the drivers manually, from the Windows Start menu, select Control Panel > System.
3. Select the Hardware tab.
4. Click Device Manager.
5. From the Other devices tree, double click to open Elster Unicom III Optical Probe.
The Elster Unicorn III Optical Probe Properties dialog displays.
6. Select the Driver tab.

7. Click Update Driver.
The Hardware Update Wizard displays.
8. Select Install from a list or specific location and click Next.
9. Browse to the location of the Metercat installation CD or the installation files and select the `UNICOM III Probe USB drivers` folder.
10. Click Next.
11. Click Finish to complete the installation of the UNICOM III USB Optical Probe device drivers.
12. Click Close to close the Properties dialog.
13. Exit the Device Manager.
14. From the Windows Start menu, select Shut Down > Restart.

You are now ready to begin using the optical probe.
3 Using the probe

Using the UNICOM III Probe (USB connector)

After you have installed the device drivers, you need to perform the following procedures before you can begin using the UNICOM III Probe (USB connector):

1. Before you begin using the probe, you must determine the COM port the probe is assigned to. See Determining COM Port Number (below) for details.

2. Once you have determined the assigned COM port, configure your meter support software to use the correct COM port. See the following sections for details:
   a. “Configuring Metercat software” on page 29
   b. “Configuring A1200 ALPHA Meter Support Software” on page 29
   c. “Configuring AlphaPlus software” on page 29

Determining COM Port Number

Before you can configure your meter support software to use the probe you must perform the following procedure to determine the COM port number Windows has assigned to the USB device.

Note: Figures are captured from a computer running Windows 2000; Windows XP dialogs may be slightly different.

1. From the Windows Start menu, select Settings > Control Panel > System.
2. Select the Hardware tab.
3. Click the Device Manager button.

   A list of devices is displayed.

4. Click to expand Ports (COM & LPT).
5. Note the COM port number assigned to the new USB device.

Configuring support software to use the COM port

During the installation of the USB device driver, Windows assigned the USB device to a COM port. Perform the procedure described in “Determining COM Port Number” on page 27 to determine the COM port number to use to configure the meter support software.

Configuring Metercat software

To configure Metercat to use the correct COM port for the USB connected probe:

1. From Metercat's Tools menu, select Machine Settings.
2. In the Connection Editor dialog, create or edit an optical probe connection to use the correct COM port.
3. Click OK.

Refer to the Metercat User Guide for more detailed information on configuring Metercat to use the correct COM port for the new device.

Configuring A1200 ALPHA Meter Support Software

To configure A1200 ALPHA Meter Support Software to use the correct COM port for the USB connected probe:

1. From A1200 ALPHA Meter Support Software's Tools menu, select User Preferences.
2. Select the Communications tab and select the correct COM port from the Serial Port drop list.

Refer to the A1200 ALPHA Meter Support Software User Guide for more detailed information on configuring A1200 ALPHA Meter Support Software to use the correct COM port for the new device.

Configuring AlphaPlus software

Note: AlphaPlus release 1.30 supports devices assigned to COM ports greater than 4.

To configure AlphaPlus software to use the correct COM port for the USB connected probe:

1. From the AlphaPlus Startup menu, select AlphaPlus System Setup.
2. Select AlphaPlus Options > Communication Options > Serial Probe Connector.
3. Press <F2> to access the drop list and select the correct COM port.
4. Press <F10> to save your changes.

Refer to AlphaPlus online help for more detailed information on configuring AlphaPlus software to use the correct COM port.

Troubleshooting

Port Conflict in Port Usage

Some hardware that uses the USB port (for example, a USB cradle for a Palm Pilot) can cause a conflict with a COM Port. The software used for accessing the hardware (for example, HotSync Manager) locks the port in the system even if no hardware is plugged into the port.

When the UNICOM III probe (USB connector) is installed, it may be assigned to the same port as the other device. This causes a port conflict to occur when trying to access the port from one of the meter support software applications.

To correct the port conflict:

1. Exit the application causing the conflict (such as HotSync Manager), then the port becomes available for the probe.
Caution: You cannot restart the conflicting application while the probe is using the port.

2. To change the port number assigned to the probe:
   a. Open the Device Manager using the procedure described in “Determining COM Port Number” on page 27.
   b. Select and expand Ports (COM & LPT) list.
   c. Select Elster Unicom III USB Optical Probe.
   d. Right-click and select Properties.
      The COM port Properties dialog displays.
   e. Select the Port Settings tab.

![Elster Unicom III USB Optical Probe (COM) Properties]

Figure 3-35. USB Optical Probe (COM) Properties

f. Click Advanced.
3. Using the probe

Figure 3-36. Advanced Settings for COM Port

g. Change the COM Port Number by selecting one of the unused COM Ports in the drop list.

h. Click OK.

i. Click OK to return to the Device Manager.

3. Record the COM port number selected and use this port number for the probe address in any meter support software you are using (see "Configuring support software to use the COM port" on page 29).

Multiple USB ports on a computer

If you insert the optical probe into a USB port different than the one it was originally installed on, the device drivers will be automatically loaded (Windows 2000) or you will be prompted to load the drivers (Windows XP).

A new COM port number is assigned for that USB port.
4 Installing the UNICOM III with USB-to-Serial Adapter

Follow the instructions provided by the adapter manufacturer. If no instructions are provided, perform the following procedure:

1. Plug the USB connector into the USB port on the computer.
   Windows should automatically recognize the new connection and display the New Hardware Wizard dialog (it may take some time on some systems).

2. If Windows does not start the New Hardware Wizard, from the Start menu, select Settings > Control Panel > Add/Remove Hardware.

3. Follow the installation instructions presented in the New Hardware Wizard.
   Windows may not automatically select the correct device driver; if you are presented with options for device drivers, select the driver for the Windows operating system and USB connector. To do this you may have to browse to a folder for the Windows operating system and USB device model you have.

Optionally, the latest device drivers can usually be downloaded from the manufacturer's web site.
4. Installing the UNICOM III with USB-to-Serial
About Elster

Elster (NYSE: ELT) is one of the world’s largest electricity, gas and water measurement and control providers. Its offerings include distribution monitoring and control, advanced smart metering, demand response, networking and software solutions, and numerous related communications and services - key components for enabling consumer choice, operational efficiency and conservation. Its products and solutions are widely used by utilities in the traditional and emerging Smart Grid markets.

Elster has one of the most extensive installed revenue measurement bases in the world, with more than 200 million metering devices deployed over the course of the last 10 years. It sells its products and services in more than 130 countries across electricity, gas, water and multi-utility applications for residential, commercial and industrial, and transmission and distribution applications.

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