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Digital Probe Calibration Programmer (#30010)

This product has multiple uses. It enables the storage of calibration data inside Networked Robotics' digital sensors. This capability enhances regulatory support for the Networked Robotics Tempurity™ System which is engineered for data collection and monitoring in FDA-regulated environments including the pharmaceutical, medical, and food industries. It also allows probe descriptive data, including electronically embedded unique IDs, and measured values such as temperature, relative humidity, voltage and other parameter types, to be elicited and transferred to other Windows applications such as Microsoft Excel®. It will be often used with laptops connected to Networked Robotics hardware in laboratories. The module is connected to a Windows® Computer via a USB port. It is used in association with the "Digital Probe Calibration

Programmer Wizard" software *which can be downloaded from our web site and run on Windows® computers.*
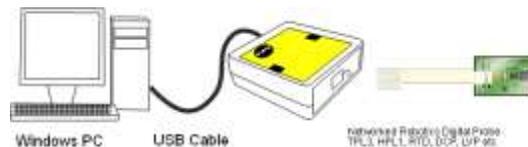
Description

This product supports all Networked Robotics digital sensors and electronic interfaces as described below but does not support Networked Robotic' direct connections to scientific instruments.

Calibration data can be stored inside and read from any Networked Robotics digital temperature probe manufactured since 2005 This product also works with some third-party digital temperature sensors manufactured by other vendors as described below.

About Networked Robotics' Unique IDs

Electronically embedded globally unique IDs are available in most of Networked Robotics' digital sensors. The IDs are assigned by different methods. This product supports the electronic reading of the following Networked Robotics probe types:

- TPL-3 series (Product #30001 and #300012) digital temperature probes - ID is assigned by Dallas-Maxim, the temperature-sensing chip manufacturer
- ACL/DCL-series (Product #30015 and others) digital power probe- ID is assigned by Dallas-Maxim
- HPL-1 (Product #30009) digital humidity and temperature probe – ID is assigned by NR

- DCP (Product #30008) dry contact probe – ID is NR-assigned
- RTD (Product #30014) resistance temperature detector probe – ID is NR-assigned
- LVP (Product #30019) low voltage probe – ID is NR-assigned
- PCU (Product #30010) digital probe calibration programmer– ID is NR-assigned
- MXQ (Product #30022) Thermo Fisher Scientific® MaxQ Incubator/Shaker interface– ID is NR-assigned

Networked Robotics' direct connection products to scientific instruments do not currently support electronically embedded unique IDs.

See the manual for each hardware product or interface for operational details.

Packing List

Included in the package are:

- (1) Digital Probe Calibration Programmer
- (1) USB Cable

Networked Robotics' probes for calibration or testing must be obtained separately.

Hardware Installation

The Digital Probe Calibration Programmer connects to a PC using a USB USB 1.1 / USB 2.0 interface. Probes are connected to the programmer via the standard RJ-45 jack as shown in the diagram above.

This module should only be connected to personal computers, and the probe port should only be connected to Networked Robotics measurement probes of any type. Do not attempt to connect the Probe Calibration Programmer to any Ethernet connection or to Networked Robotics' NTMS network hardware

You must download the "Digital Probe Calibration Program Wizard" software, a Windows® application, from our download page at http:\\www.networkedrobotics.com\download\ .

Installation of the USB driver is often an automatic process and is similar to the process of using other USB hardware.

If the Calibration program does not recognize the programmer, which could be the case on some Windows 8 and Windows 7 systems, attach the programmer via the USB port and reboot the computer and try again.

If it still doesn't connect see the Appendix for information on the right USB driver.

Networked Robotics' Digital Probe Calibration Programmer Wizard Software

Download the Software

Download the "Probe Calibration Programmer Wizard" software from the Networked Robotics web site at www.networkedrobotics.com/download and then click on the icon to download. Once downloaded double-click on the icon to run the wizard.

Using the Digital Probe Calibration Programmer Wizard Software
Connect one of your Networked Robotics sensors to the port labeled "probe" on the programmer. Some digital probes may require connections to their intended source in order for a valid ID to be read, for example the RTD probe requires a connection to a PT-100 RTD element. In general the probe must be ready for data acquisition in order for the ID, calibration data, and other information to be read.

The photo to the right shows CAT5 cable that is connected to a Networked Robotics RTD probe (RTD not shown). All of our digital probe products plug directly into the "probe" port of the Calibration Programmer.

Next, double click on the Digital Probe Calibration Programmer Wizard program icon. Follow the prompts. Then click on the "Query" button. The software will query your probe and display relevant ID, firmware version, and a current measurement. To refresh the information simply hit the "query" button again. To read from a new probe, unplug the existing probe, plug the new plug in, and hit the "query" button. If probes are not reading as expected you should exit the Calibration Programmer software and then restart the software and try again.

If the Wizard Software Can't Find the Programmer

In some cases USB driver issues may require you to reboot the computer with the Calibration Programmer attached before you can run the software. See also the "USB Driver" section above.

Reading from Probes

Some sample reports from relative humidity and alarm contact probes are:

```
HPL3 1.0: 25-Apr-07 21:54:00
Serial#:04:0000:0000:0101
Current reading: + 25.5 C, 52.9 %

DCP 1.0: 26-Jul-07 11:26:43
Serial#:07:0000:0000:100A
```

Now connect your Networked Robotics digital probe to the Calibration Programmer and press "Query".

```
.
TPL3: Revision unknown
Electronic ID: 00-00-06-AE-E6-2E
Colorcoded Red
Last Calibration: New Probe Not
Stored
Current reading: +025.6 C
.
```

ID to File

CAL to File

Show TPL3 Cal Options   Exit   Query

Transferring Embedded IDs to Excel or Other Applications
You can use your mouse to highlight any portion of the screen, including the probe embedded ID, or data values, and then right-click and choose the "Copy" option. You can then Paste into other applications, including Microsoft Excel®.

Color Coding

Networked Robotics' digital probes are color coded by the last digit of their electronically embedded unique ID. Four examples are shown.
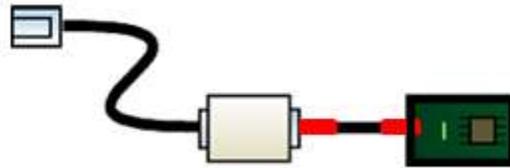
Last Digit of Electronic ID	Color	Last Digit of Electronic ID	Color
0 Green		8 Black	
1 Yellow		9 Dk Blue	

See our support page on color codes for a full list of all 16 possible color codes and the associated last digit of the Networked Robotics unique electronically embedded ID.

ID to File

When you click on the "ID to File" button the program will store the electronic ID for the probe currently visible in the window to the comma separated value file "probeIds.csv" on the desktop. This file can be opened with Microsoft Excel® or other utilities.

If the "probeids.csv" file does not exist it will be created. If it does exist the new electronic ID will be appended to the last line of the existing file.

CAL to File

When you click on the "Cal to File" button the program will store the electronic ID for the probe currently visible in the window and all of its calibration information to the comma separated value file "caldata.csv" on the desktop. This file can be opened with Microsoft Excel® or other utilities. If the file doesn't exist it will be created. If it exists the new information will be appended to the last line of the spreadsheet. Cal to File stores the ID, the calibration date, the stored temperature offset, and the current reading.

Calculating and Programming Electronic Calibration Data in Networked Robotics' TPL3-series Digital Temperature Probes

The figure above shows a "query" from a TPL3-series digital temperature probe that is newly manufactured. A unique ID for TPL3-series probes is the electronic ID of the Dallas/Maxim chip used to measure temperature. The ID is assigned by Dallas/Maxim rather than by Networked Robotics.

For a new probe the "New Probe not Stored" indicator is listed for the calibration date. No last calibration date has been entered yet for this digital sensor. Once calibration data is programmed, the unit can never be restored to "New Probe not Stored" status.

The below shows the probe query once calibration data has been stored.
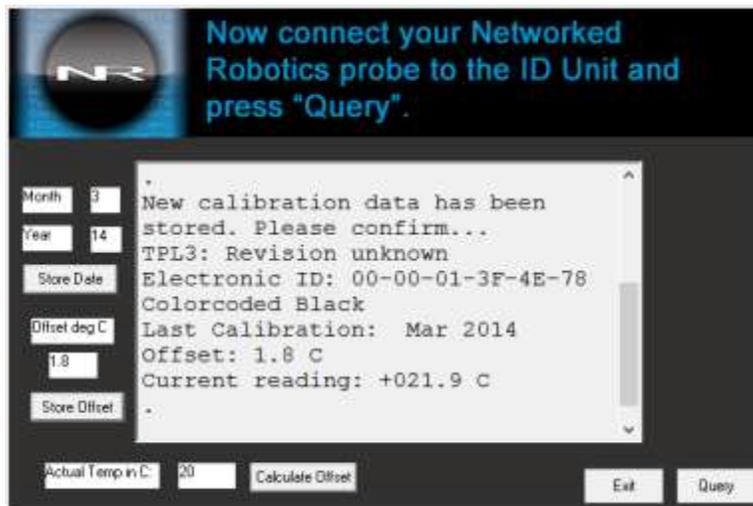
Automatically Calculating Temperature Offset
The offset of the calibration can be calculated automatically. To do this enter the ambient temperature to which to the probe is currently exposed (for example 0.1) in the field "Actual Temp in degrees C". The offset is automatically calculated from the last reading as indicated by the "Current Reading:" line of the display window. A previous "query" must have been executed in

order for the offset to be calculated. The calculated offset is entered into the field based on the last query and the actual temperature.

Reference

Probe Serial Numbers and Firmware Revision

The format of the serial number varies slightly between Networked Robotics' device types. Probes with firmware are also capable of reporting their revision numbers and date of compilation to the unit.

> **Digital Temperature Probes** *TPL-3-series probes contain hexadecimal serial numbers of the form: XX-XX-XX-XX-XX-XX-XX, where XX is an 8 bit hexadecimal number from 00 to FF. TPL3-series probes do not have a firmware revision number, so "Revision unknown" will be displayed. This is normal and not a cause for alarm.*

> **Digital Power Probes** *ACL and DCL-series probes contain hexadecimal serial numbers of the form: XX-XX-XX-XX-XX-XX-XX, where XX is an 8 bit hexadecimal number from 00 to FF. These probes do not have a firmware revision number, so "Revision unknown" will be displayed.*

> **Digital Humidity/Temperature Probes** *(HPL) have hexadecimal based serial numbers very similar to the DCP. They are of the form: 06:XXXX:XXXX:XXXX, where XXXX is a 16 bit hexadecimal number from 0000 to FFFF*

> **Dry Contact Probes** *(DCP) have hexadecimal based serial numbers of the form: 07:XXXX:XXXX:XXXX, where XXXX is a 16 bit hexadecimal number from 0000 to FFFF.*

> **Resistive Temperature Detector Probes** *(RTD) have hexadecimal based serial number of the form 08:XXXX:XXXX:XXXX, where XXXX is a 16 bit hexadecimal number from 0000 to FFFF.*

> **Low Voltage Probes** *(RTD) have hexadecimal based serial number of the form 0A:XXXX:XXXX:XXXX, where XXXX is a 16 bit hexadecimal number from 0000 to FFFF.*

> **Digital Probe Calibration Programmers** *(PCU) do not have unique IDs.*

> **MaxQ Interface version of NR Streamer Probe**: *have hexadecimal based serial numbers of the form: 0B:XXXX:XXXX:XXXX, where XXXX is a 16 bit hexadecimal number from 0000 to FFFF.*

As new probe types become available from Networked Robotics, IDs will follow the form: YY:XXXX:XXXX:XXXX as above where YY is the probe type and the Xs are serial number digits in hexadecimal form.

Product History

This unit was formerly called the "Probe ID Unit". Previous versions were able to read the unique IDs in our digital probes and were able to elicit readings, but were not designed to program probes with calibration data. The current product will program all Networked Robotics TPL3 digital temperature probes ever sold by Networked Robotics Corporation.

Compatibility with non-Networked Robotics Measurement Products

The Networked Robotics' Probe Calibration Programmer hardware is capable of storing calibration data and reading electronic IDs from probes manufactured by Embedded Data Systems™.

Physical Specifications

Weight:	56 grams (2.0 ounces)
Length:	67.22 mm (2.647 inches)
Width:	66.22 mm (2.607 inches)
Height:	28 mm (1.102 inches)

Support

If you need assistance with your Digital Probe Calibration Programmer, contact Networked Robotics by phone at 877-FRZ-TEMP (877-379-8367) or by email at support@networkedrobotics.com.

APPENDIX – Installing the USB Driver

In some cases you may need to install the Windows USB driver manually. USB driver manual installation instructions are listed below however in most cases the driver will load automatically

and you should skip to the ![stamp icon] Networked Robotics' Digital Probe Calibration Programmer Wizard Software section below.

Driver Installation

The computer should be connected to the internet the first time you plug in the calibration programmer hardware into a USB port. You will only have to go through this driver installation once.


The screenshots below are relevant to the Windows XP® operating system.

Connect the programmer to an open USB port on your PC using the supplied USB cable. Windows will alert you that it has found a new hardware: "FT USB UART". The first time you have connected the Digital Probe Programmer the Windows New Hardware Wizard will launch and ask if you want to allow Windows to search for a driver automatically. Select "Yes, this time only" and click "next". See the screens below:

On the next screen, select "Install the software automatically" and click "next".
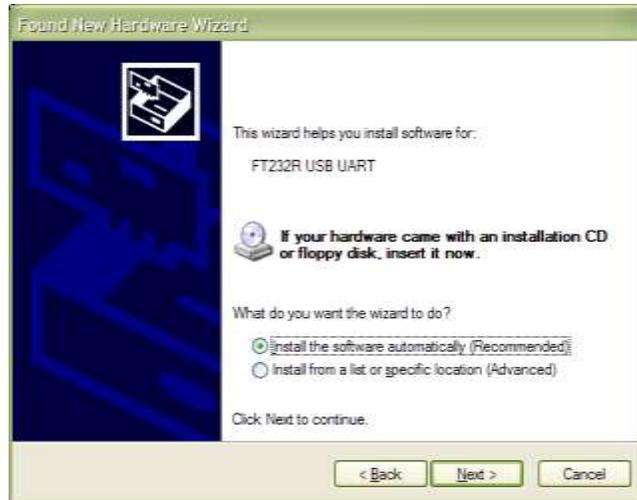
It may take a minute or so, but the system should eventually fetch and install the correct drivers and you will get a screen similar to the following:

Click "finish", and Windows will go thru one more driver install for the "USB serial port." Just select the same search options as above. When this is done you may see a small popup from your system tray informing you that your new hardware is ready to use. You are now ready to download and launch the Digital Probe Calibration Programmer Wizard Software