



**QUALITROL®**

## *OmniFlex-2™*

**With Ethernet Interface**

**Fiber Optic Thermometer Systems**

**Multi-Channel Systems (4 to 104 Channels)  
With TCP/IP Interface and Webserver**

Neoptix Canada LP  
1415, rue Frank-Carrel, Suite 220  
Québec, QC, G1N 4N7  
Canada  
Tel: 418-687-2500  
Fax: 418-687-2524  
[support@neoptix.com](mailto:support@neoptix.com)

### **Proprietary notice:**

Details of design and engineering are the exclusive property of **Neoptix Canada LP** and are strictly confidential. The information given herein is subject to change, at any time and without notice.

All rights are reserved. The information in this document may not be reproduced or passed on in any manner without prior written consent of **Neoptix**.

Neoptix, Inc. shall not be liable for technical or editorial errors or omissions contained herein; nor for incidental or consequential damages resulting from the furnishing, performance, or use of this material.

All trademarks are the property of their respective owners.

Part number: G1053R01 (August 2015)

## TABLE OF CONTENTS

<b>1</b>	<b>END USER LICENSE &amp; SOFTWARE WARRANTY AGREEMENT</b> .....	<b>4</b>
1.1	OMNIFLEX-2 FAMILY AND NEOPTIX PROBE WARRANTY NOTICE .....	7
<b>2</b>	<b>INTRODUCTION</b> .....	<b>8</b>
2.1	SYSTEM DESCRIPTION .....	9
2.2	OMNIFLEX GENERAL SPECIFICATIONS .....	9
2.3	OMNIMODULE SPECIFICATIONS .....	10
2.3.1	4-channel module, direct (OFX2-4D) or sequential (OFX2-04).....	10
2.3.2	8-channel module, sequential (OFX2-08).....	10
2.3.3	16-output analog output module, sequential (OFX2-AOUT).....	10
2.4	OPTIONS.....	10
2.5	CALIBRATION.....	11
<b>3</b>	<b>UNPACKING</b> .....	<b>12</b>
<b>4</b>	<b>OMNIFLEX-2™ HARDWARE REFERENCE</b> .....	<b>13</b>
4.1	OMNIFLEX-2 (OFX2) HARDWARE DESCRIPTION .....	13
4.2	DISPLAY DESCRIPTION .....	15
4.3	TOUCH SCREEN OPERATION AND SETUP MENU .....	15
4.4	THE MODULE MENU .....	16
4.5	THE LOGGING MENU .....	16
4.6	REAL-TIME DATA VIEWER.....	17
<b>5</b>	<b>USING THE TEMPERATURE PROBES</b> .....	<b>18</b>
5.1	CAUTION .....	18
5.2	DESCRIPTION .....	18
5.3	WARNING.....	18
5.4	WORKING WITH LONG PROBES.....	19
5.5	WORKING WITH CRYOGENIC PROBES.....	19
<b>6</b>	<b>QUICK INTRODUCTION</b> .....	<b>20</b>
6.1	SETTING UP A PRIVATE NETWORK, USING A STATIC IP ADDRESS .....	22
6.2	WORKING WITH YOUR INTERNET BROWSER .....	24

### **Warning**

Permanent damage may be done to the thermometer if the power supply connections are not done correctly. In particular, do not connect the power input (20-28 VDC) to any of the analog output connectors. Note that the 20 mA analog output options are self-powered interfaces (by opposition to loop-powered interfaces), and thus do not require any external supply.

With 0-10 volt analog outputs, avoid shorting output leads together; as this may damage the electronic drivers inside the OFX2 modules.

Fiber optic probes and extension cables are fragile, and will break if the bending radius becomes less than ~1 cm, even temporarily. Probe and extension cable breakages are not covered under the standard Neoptix warranty.

To assure cleanliness of optical connectors, keep caps on unused connectors at all time. This is also required during operation, as parasitic light entering via unused connectors into the OFX2 modules may cause false temperature readings, even on other channels.

The Neoptix OmniFlex products are CE marking certified.

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.

# 1 END USER LICENSE & SOFTWARE WARRANTY AGREEMENT

PLEASE READ THIS SOFTWARE LICENSE CAREFULLY BEFORE DOWNLOADING, INSTALLING OR USING ANY QUALITROL OR QUALITROL-SUPPLIED SOFTWARE. BY DOWNLOADING OR INSTALLING THE SOFTWARE, OR USING THE EQUIPMENT THAT CONTAINS THIS SOFTWARE, YOU ARE CONSENTING TO BE BOUND BY THIS LICENSE.

The following terms govern your use of the Software except to the extent a particular program (a) is the subject of a separate written agreement with Qualitrol or (b) includes a separate "clickwrap" license agreement as part of the installation and/or download process. To the extent of a conflict between the provisions of the foregoing documents, the order of precedence shall be (1) the written agreement, (2) the clickwrap agreement, and (3) this Software License.

License. Subject to the terms and conditions of and except as otherwise provided in this Agreement, Qualitrol Systems, Inc. or the Qualitrol Systems, Inc. subsidiary licensing the Software, if sale is not directly by Qualitrol Systems, Inc. ("Qualitrol"), and its suppliers grant to Customer ("Customer") a nonexclusive and non-transferable license to use the specific Qualitrol program modules, feature set(s) or feature(s) for which Customer has paid the required license fees (the "Software"), in object code form only. In addition, the foregoing license shall also be subject to the following limitations, as applicable:

- Unless otherwise expressly provided in the documentation, Customer shall use the Software solely as embedded in, for execution on, or (where the applicable documentation permits installation on non-Qualitrol equipment) for communication with Qualitrol equipment owned or leased by Customer
- Customer's use of the Software shall be limited to use on a single hardware chassis, on a single central processing unit, as applicable, or use on such greater number of chassis or central processing units as Customer may have paid Qualitrol the required license fee; and
- Customer's use of the Software shall also be limited, as applicable and set forth in Customer's purchase order or in Qualitrol's product catalog, user documentation, or web site, to a maximum number of (a) seats (i.e. users with access to the installed Software), (b) concurrent users, sessions, ports, and/or issued and outstanding IP addresses, and/or (c) central processing unit cycles or instructions per second. Customer's use of the Software shall also be limited by any other restrictions set forth in Customer's purchase order or in Qualitrol's product catalog, user documentation or web site for the Software.

NOTE: For evaluation or beta copies for which Qualitrol does not charge a license fee, the above requirement to pay a license fee does not apply.

General Limitations. Except as otherwise expressly provided under this Agreement, Customer shall have no right and Customer specifically agrees not to:

- (i) transfer, assign or sublicense its license rights to any other person, or use the Software on unauthorized or second-hand Qualitrol equipment, and any such attempted transfer, assignment or sublicense shall be void;
- (ii) make error corrections to or otherwise modify or adapt the Software or create derivative works based upon the Software, or to permit third parties to do the same; or (iii) decompile, decrypt, reverse engineer, disassemble or otherwise reduce the Software to human readable form to gain access to trade secrets or confidential information in the Software. To the extent required by law, at Customer's request, Qualitrol shall provide Customer with the interface information needed to achieve interoperability between the Software and another independently created program, on payment of Qualitrol's applicable fee. Customer shall observe strict obligations of confidentiality with respect to such information.

Upgrades and Additional Copies. For purposes of this Agreement, "Software" shall include (and the terms and conditions of this Agreement shall apply to) any upgrades, updates, bug fixes or modified versions (collectively, "Upgrades") or backup copies of the Software licensed or provided to Customer by Qualitrol or an authorized distributor for which Customer has paid the applicable license fees.

NOTWITHSTANDING ANY OTHER PROVISION OF THIS AGREEMENT: (1) CUSTOMER HAS NO LICENSE OR RIGHT TO USE ANY SUCH ADDITIONAL COPIES OR UPGRADES UNLESS CUSTOMER, AT THE TIME OF ACQUIRING SUCH COPY OR UPGRADE, ALREADY HOLDS A VALID LICENSE TO THE ORIGINAL SOFTWARE AND HAS PAID THE APPLICABLE FEE FOR THE UPGRADE; (2) USE OF UPGRADES IS LIMITED TO QUALITROL EQUIPMENT FOR WHICH CUSTOMER IS THE ORIGINAL END USER PURCHASER OR LESSEE OR WHO OTHERWISE HOLDS A VALID LICENSE TO USE THE SOFTWARE WHICH IS BEING UPGRADED; AND (3) USE OF ADDITIONAL COPIES IS LIMITED TO BACKUP PURPOSES ONLY.

Proprietary Notices. Customer agrees to maintain and reproduce all copyright and other proprietary notices on all copies, in any form, of the Software in the same form and manner that such copyright and other proprietary notices are included on the Software. Except as expressly authorized in this Agreement, Customer shall not make any copies or duplicates or any Software without the prior written permission of Qualitrol. Customer may make such backup copies of the Software as may be necessary for Customer's lawful use, provided Customer affixes to such copies all copyright, confidentiality, and proprietary notices that appear on the original.

Protection of Information. Customer agrees that aspects of the Software and associated documentation, including the specific design and structure of individual programs, constitute trade secrets and/or copyrighted material of Qualitrol. Customer shall not disclose, provide, or otherwise make available such trade secrets or copyrighted material in any form to any third party without the prior written consent of Qualitrol. Customer shall implement reasonable security measures to protect such trade secrets and copyrighted material. Title to Software and documentation shall remain solely with Qualitrol.

Term and Termination. This License is effective until terminated. Customer may terminate this License at any time by destroying all copies of Software including any documentation. Customer's rights under this License will terminate immediately without notice from Qualitrol if Customer fails to comply with any provision of this License. Upon termination, Customer must destroy all copies of Software in its possession or control.

Customer Records. Customer grants to Qualitrol and its independent accountants the right to examine Customer's books, records and accounts during Customer's normal business hours to verify compliance with this Agreement. In the event such audit discloses non-compliance with this Agreement, Customer shall promptly pay to Qualitrol the appropriate licensee fees.

Export. Software, including technical data, may be subject to U.S. export control laws, including the U.S. Export Administration Act and its associated regulations, and may be subject to export or import regulations in other countries. Customer agrees to comply strictly with all such regulations and acknowledges that it has the responsibility to obtain licenses to export, re-export, or import Software.

U.S. Government End Users. The Software and associated software documentation qualify as "commercial items," as that term is defined at 48 C.F.R. 2.101, consisting of "commercial computer software" and "commercial computer software documentation" as such terms are used in 48 C.F.R. 12.212. Consistent with 48 C.F.R.12.212 and 48 C.F.R. 227.7202-1 through 227.7202-4, Licensee will provide to Government end user, or, if this Agreement is direct Government end user will acquire, the Software and software documentation with only those rights set forth herein that apply to nongovernmental customers. Use of this Software and software documentation constitutes agreement by the government entity that the computer software and computer software documentation is commercial, and constitutes acceptance of the rights and restrictions herein.

Limited Warranty. Qualitrol Systems, Inc. or the Qualitrol Systems, Inc. subsidiary licensing the Software, if sale is not directly by Qualitrol Systems, Inc. ("Qualitrol") warrants that commencing from the date of delivery to Customer and continuing for a period of the longer of (a) ninety (90) days or (b) the period set forth in the Warranty Card accompanying the Product (if any): (a) the media on which the Software is furnished will be free of defects in materials and workmanship under normal use; and (b) the Software substantially conforms to its published specifications. The date of shipment of a Product by Qualitrol is set forth on the packaging material in which the Product is shipped. Except for the foregoing, the Software is provided "AS IS". This limited warranty extends only to the Customer who is the original licensee. Customer's sole and exclusive remedy and the entire liability of Qualitrol and its suppliers under this limited warranty will be, at Qualitrol or its service center's option, repair, replacement, or refund of the Software if reported (or, upon request, returned) to the party supplying the Software to Customer, if different than Qualitrol. In no event does Qualitrol warrant that the Software is error free or that Customer will be able to operate the Software without problems or interruptions. In addition, due to the continual development of new techniques for intruding upon and attacking networks, Qualitrol does not warrant that the Software or any equipment, system or network on which the Software is used will be free of vulnerability to intrusion or attack.

Restrictions. This warranty does not apply if the Product (a) has been altered, except by Qualitrol, (b) has not been installed, operated, repaired, or maintained in accordance with instructions supplied by Qualitrol, (c) has been subjected to abnormal physical or electrical stress, misuse, negligence, or accident; or (d) is licensed, for beta, evaluation, testing or demonstration purposes for which Qualitrol does not receive a payment of purchase price or license fee.

DISCLAIMER OF WARRANTY. EXCEPT AS SPECIFIED IN THIS WARRANTY, ALL EXPRESS OR IMPLIED CONDITIONS, REPRESENTATIONS, AND WARRANTIES INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, NONINFRINGEMENT, SATISFACTORY QUALITY OR ARISING FROM A COURSE OF DEALING, LAW, USAGE, OR TRADE PRACTICE, ARE HEREBY EXCLUDED TO THE EXTENT ALLOWED BY APPLICABLE LAW. TO THE EXTENT AN IMPLIED WARRANTY CANNOT BE EXCLUDED, SUCH WARRANTY IS LIMITED IN DURATION TO THE WARRANTY PERIOD. BECAUSE SOME STATES OR JURISDICTIONS DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, THE ABOVE LIMITATION MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM JURISDICTION TO JURISDICTION.

This disclaimer and exclusion shall apply even if the express warranty set forth above fails of its essential purpose.

Disclaimer of Liabilities. IN NO EVENT WILL QUALITROL OR ITS SUPPLIERS BE LIABLE FOR ANY LOST REVENUE, PROFIT, OR DATA, OR FOR SPECIAL, INDIRECT, CONSEQUENTIAL, INCIDENTAL, OR PUNITIVE DAMAGES HOWEVER CAUSED AND REGARDLESS OF THE THEORY OF LIABILITY ARISING OUT OF THE USE OF OR INABILITY TO USE SOFTWARE EVEN IF QUALITROL OR ITS SUPPLIERS HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

In no event shall Qualitrol's or its suppliers' liability to Customer, whether in contract, tort (including negligence), or otherwise, exceed the price paid by Customer. The foregoing limitations shall apply even if the above-stated warranty fails of its essential purpose.

BECAUSE SOME STATES OR JURISDICTIONS DO NOT ALLOW LIMITATION OR EXCLUSION OF CONSEQUENTIAL OR INCIDENTAL DAMAGES, THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

The Warranty and the Software License shall be governed by and construed in accordance with the laws of the State of New York, without reference to principles of conflict of laws, provided that for Customers located in a member state of the European Union, Norway or Switzerland, English law shall apply. The United Nations Convention on the International Sale of Goods shall not apply. If any portion hereof is found to be void or unenforceable, the remaining provisions of the Warranty and the Software License shall remain in full force and effect. Except as expressly provided herein, the Software License constitutes the entire agreement between the parties with respect to the license of the Software and supersedes any conflicting or additional terms contained in the purchase order.

If Customer has entered into a contract directly with Qualitrol for supply of the Products subject to this warranty, the terms of that contract shall supersede any terms of this Warranty or the Warranty Card, or the Software License, which are inconsistent with that contract. Customer acknowledges that the Internet URL address and the web pages referred to in this document may be updated by Qualitrol from time to time and the version in effect at the date of delivery of the Products to the Customer shall apply.

### **1.1 OmniFlex-2 Family and Neoptix Probe Warranty Notice**

Your **OmniFlex-2** unit is guaranteed (Parts and Workmanship) for one full year from the date of purchase. Upon written notification of any defect, Neoptix will either repair or replace any faulty product or components thereof. A Return Authorization Number (RMA) must be obtained from Neoptix Canada LP or authorized distributor prior to any merchandise return.

Due to the unique nature of the fiber optic probes and extension cables that are used with the Neoptix Conditioner system, probes and extensions are not warranted.

When using any electrical appliance, basic safety precautions should be followed, including the following:

- Do not operate in wet / damp environments
- Do not operate in explosive atmospheres
- Keep product surface dry and clean.

Always make sure all electrical installations are made in accordance with local authorities' regulations and laws.

## 2 INTRODUCTION

**Congratulations** on the purchase of your **OmniFlex-2™** (OFX2) thermometer product! Your new temperature sensing system will soon allow you to take full advantage of the benefits inherent to fiber optic sensing technology. It offers accurate and reliable temperature measurements in a package that offers unprecedented configuration flexibility, combined with extraordinary insensitivity to EMI/RFI, high voltage insulation and disturbance free sensing due to the non-electrical nature of the sensor element used.

Not only does the OmniFlex family of products gives consumers' access to reliable measurements, but it also offers a simple user interface that makes the technology easy to use. Moreover, no special calibration is required when changing the fiber optic sensor elements.

The thermometer chassis is packaged in a standard 3U and 6U 19" rack, which is ideally suited for industrial applications. It can also be used as a desktop instrument, or you can install it in an instrument rack.

The standard configuration is offered with an Ethernet RJ45 port. Analog outputs are offered optionally, in the form of an independent module; this can be used for remote interfacing purposes.

Interfacing would primarily be done using the built-in web server feature; this allows exploiting the full capabilities of the OmniFlex without having to install any software on your PC or MAC computer. Furthermore, its color touch screen (QVGA, 320 x 240 pixels) adds versatility in the use of the instrument.

Data logging is a standard feature. Total memory capacity is 8 GBytes, which will allow logging data for years. The internal operating system is based on UNIX.

A convenient USB port is also available to download logged data and other file transfer operation; this is a future feature. Please note that this port cannot be used to interface the OmniFlex-2 to a computer.



The system is offered with 2 chassis sizes:

- The 3U version (5.25 inch or 13.34 cm high) can accommodate up to 6 modules (also called OmniModules). This version is shown above.
- The 6U version (10.5 inch or 26.7 cm high) will accommodate up to 13 modules.

All OmniModules are hot swappable; there is no need to power off the chassis to add or remove a module. The software will automatically recognize any configuration change.



## 2.1 System description

A complete OmniFlex-2 system is normally composed of one or more OmniFlex chassis, and one or more signal conditioner modules. Each chassis can accept up to 6 or 13 OmniModules. Neoptix offers different type of OmniModules, as follows (each must be purchased separately):

- 4-channel, direct (for fast temperature acquisition)
- 4-channel, sequential
- 8-channel, sequential
- 16-output analog output module (option to be used if analog outputs are required, 0-10 V or 4-20 mA). This is a future option.

## 2.2 OmniFlex general specifications

The following table gives specifications that are applicable to an OmniFlex system. Then, each OmniModule is described separately.

Resolution	0.1 °C
Accuracy	+/- 1 °C
Calibrated Temperature Range	-35 ° to 175 °C
Usable Temperature Range	-80 ° to 250 °C Cryogenic temperature range available as an option*
Number of channels*	4 or 8 (per module)
Analog outputs	Requires a dedicated OmniModule, 16 outputs per module 0-10 V or 4-20 mA (software selectable)
Number of modules per chassis	Up to 6 modules for the 3U chassis Up to 13 modules for the 6U chassis
Maximum number of channels	104 Each OmniModule can have 4 or 8 channels
Probe length	1 to 500 meters
Response time	Typically 0.2 second per channel (probe configuration dependent)
Unit	User selection of °C or °F
Operating temperature	-10 ° to +60 °C, non-condensing
Storage temperature	-30 ° to 80 °C
Local display	Color touch screen, 320 x 240 pixels (QVGA)
Power	Included with the chassis: Universal medical grade power supply included, 100 to 240 VAC, table mount. Output is 24 VDC
Size	19 inch rack mount (height: 3U or 6U) 180H (or 360H) x 483W x 170D mm (not including handles)
Chassis weight	3 to 8 kg, depending on the number of installed modules
Standard interface	Ethernet copper RJ45 Serial RS-485 (future option)
Options	Analog outputs USB (to save files) (future option)
Sensor	Dielectric epoxy or silicone tipped optical fiber

\*: Selection must be specified at time of order.

## 2.3 OmniModule specifications

### 2.3.1 4-channel module, direct (OFX2-4D) or sequential (OFX2-04)

Number of channels	4
Electronic refresh time	0.1 second (direct) 0.25 second per enabled channel (sequential)
Size	133H x 51W x 165D mm
Weight	0.7 to 0.5 kg
Power (direct)	18 to 30 VDC (24 VDC nominal) Current, typical: 0.1 A @ 24 VDC input voltage Current, worst case: 0.15 A @ 24 VDC input voltage
Power (sequential)	18 to 30 VDC Current, typical: 0.03 A @ 24 VDC input voltage Current, worst case: 0.06 A @ 24 VDC input voltage

### 2.3.2 8-channel module, sequential (OFX2-08)

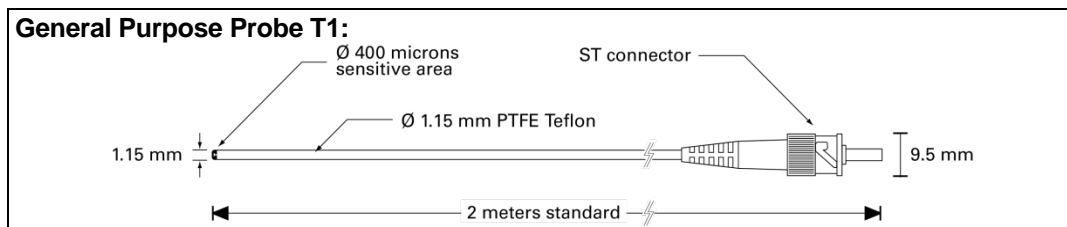
Number of channels	8
Electronic refresh time	0.25 second per enabled channel (sequential)
Size	133H x 51W x 165D mm
Weight	0.6 kg
Power	18 to 30 VDC (24 VDC nominal) Current, typical: 0.03 A @ 24 VDC input voltage Current, worst case: 0.06 A @ 24 VDC input voltage

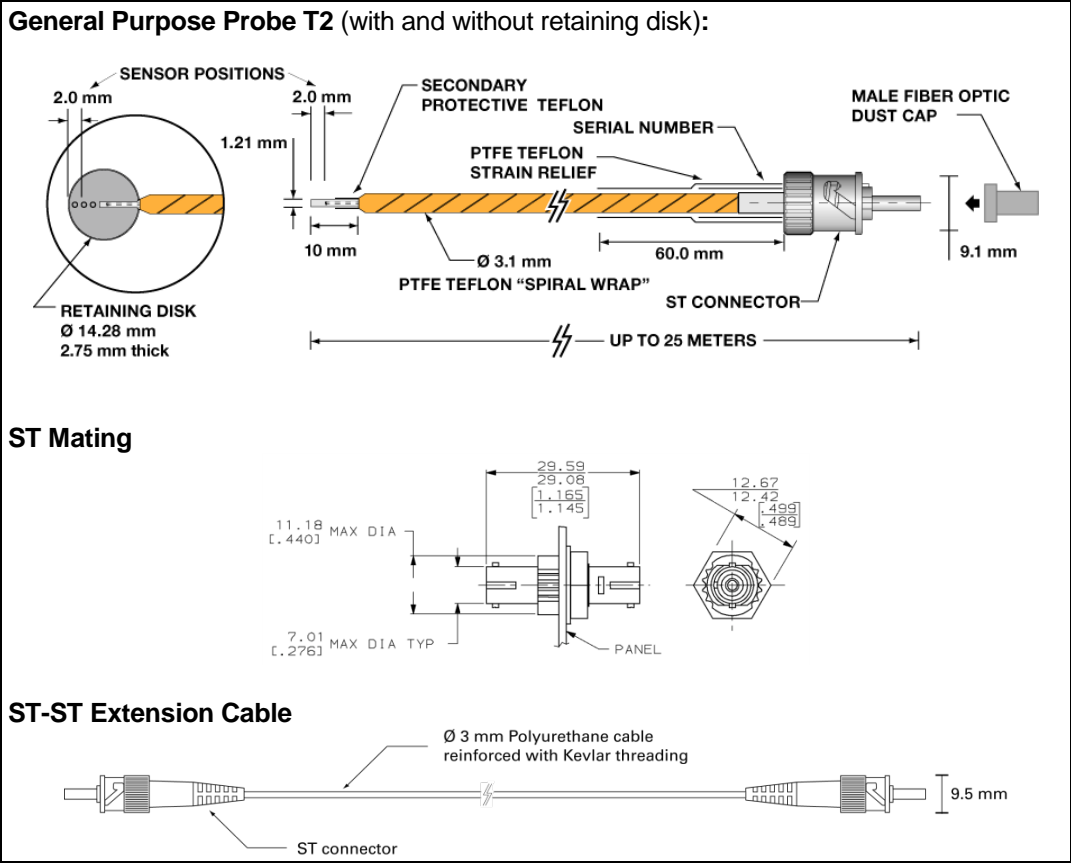
### 2.3.3 16-output analog output module, sequential (OFX2-AOUT)

Number of outputs	16
Operating mode	0-10 V or 4-20 mA (software selectable)
Connector type	2 x 16 position terminal blocks (2 contacts required for each output)
Size	133H x 51W x 165D mm
Weight	0.4 kg
Power	18 to 30 VDC (24 VDC nominal) Current, typical: 0.03 A @ 24 VDC input voltage Current, worst case: 0.06 A @ 24 VDC input voltage

## 2.4 Options

The following figure gives a description of the various probe configurations that are optionally available from Neoptix.





Other options and configurations are also possible; contact Neoptix for more information.

**2.5 Calibration**

Each OmniFlex-2 OmniModule comes factory-calibrated. The OmniFlex system normally would not require any future calibration; however, an annual re-calibration is recommended every 12 months or whenever performance verification indicates that calibration is necessary, according to your ISO9000 requirement or equivalent. NIST traceable calibration certificates are available. All calibrations are performed at the factory. Contact your Neoptix Representative for further information.

### 3 UNPACKING

Before using your OmniFlex-2 thermometer, check the box content to be sure all items have been included. Your package should normally contain:

- OmniFlex-2 chassis (3U or 6U)
- Signal conditioner OmniModule(s)
- Blank panels (enough, so the total of modules and blank panels is 6 or 13)
- Power supply module (universal input: 100-240VAC, 50/60Hz)
- 2-meter Ethernet cable
- Neoptix OmniLink™ software (supplied on a CD)
- User manual (this manual), supplied on the same CD
- Calibration Certificates, one for each OmniModule.

*Options:*

- Fiber optic temperature sensor probes
- Fiber optic extension cables (also called sometime “patch cords”)
- Fiber optic ST-ST matings
- Carrying case & accessories.

Make sure all listed items have been received and are in good condition. Note any evidence of rough handling in transit; immediately report any damage to the shipping agent. Should a part be missing or damaged, please contact your distributor immediately. Returns must be made with the original packaging, accompanied by an authorization number (RMA). Your distributor will provide you with information concerning the return of merchandise.

The carrier will not honor damage claims unless all shipping material is saved for inspection. After examining and removing contents, save packing material and carton in the event reshipment becomes necessary.

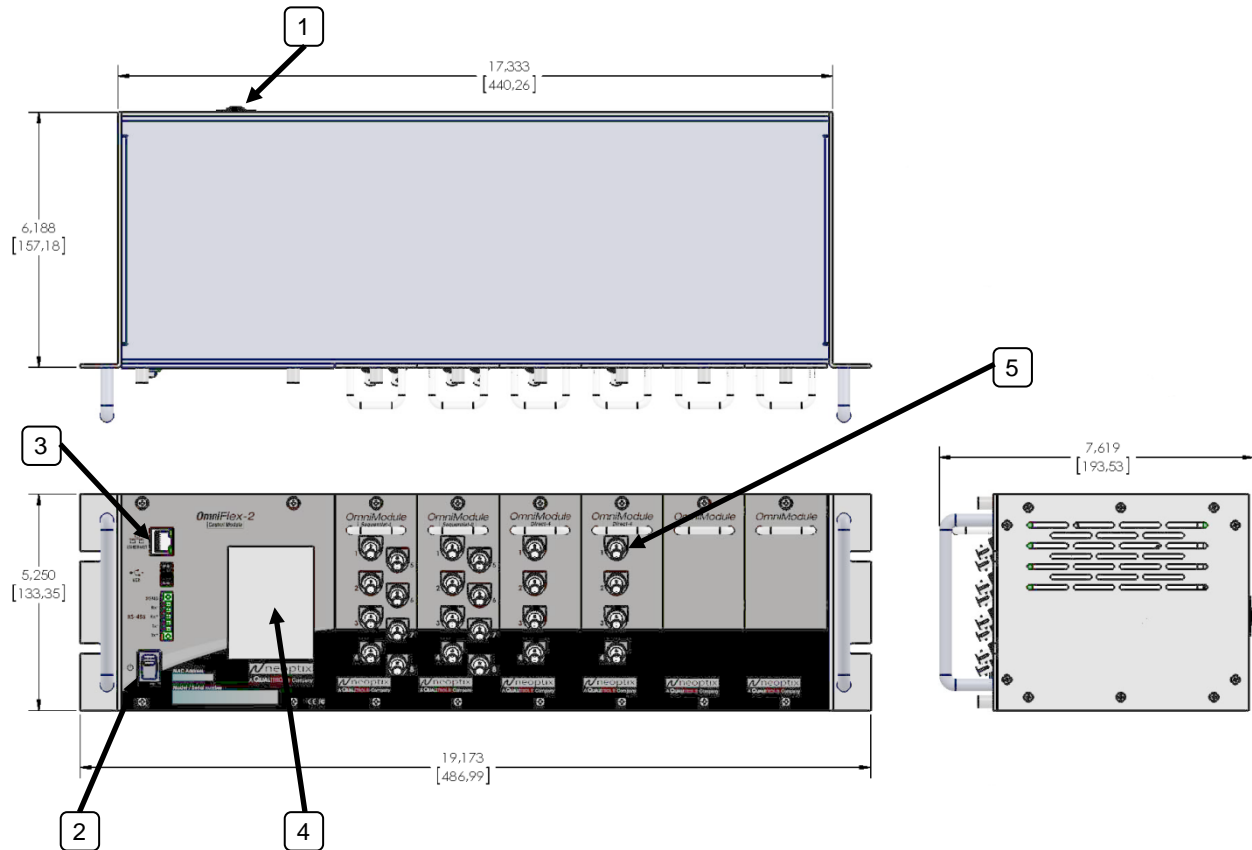
## 4 OMNIFLEX-2™ HARDWARE REFERENCE

### 4.1 OmniFlex-2 (OFX2) hardware description

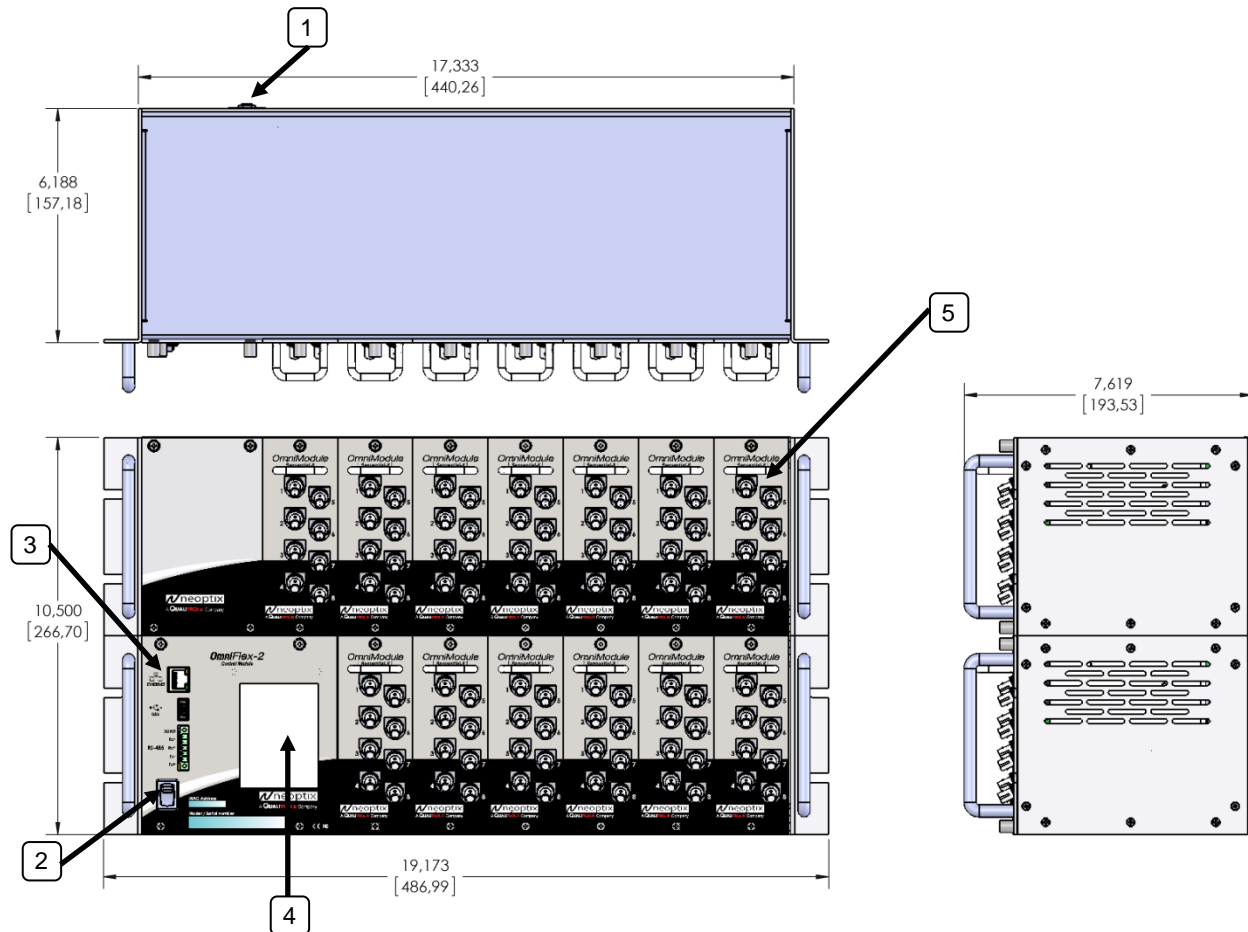
The following figure shows the chassis OFX2 thermometer mechanical layout, including dimensions in inches and [mm]. As two versions of chassis are offered, 2 drawings are shown here.

Information: The CPU module includes a USB and a terminal block for a RS485 port; currently, these 2 hardware features are not supported by software.

3U version (can accommodate up to 6 OmniModules):



6U version (can accommodate up to 13 OmniModules):



1) **20-28 Volt DC power connector:** You must use a DC power supply. It is highly recommended to use the power supply module that is shipped with your OFX2 chassis.

The recommended power supply module requires an 47 to 63 Hz 100-240 VAC source.

2) **Power switch.**

3) **RJ45 Ethernet connector:** Use a standard Ethernet cable to connect the OFX2 chassis.

4) **QVGA color display.** This touch display can be used to perform some basic operation on your OFX2 system. The web server should be used to operate the system, as it offers more capabilities. The operation of the display is described in the next subsection.

5) **Sensor connector(s):** These are ST type connectors, mating to each of the 8 optical temperature sensors per OmniModule. If you need to extend a sensor fiber, you should use optional extension cables that are available from your Neoptix supplier.

**Information:** At time of writing this guide, the USB and RS-485 ports are not supported.

**Warning:** The fiber type that is used with your T/Guard thermometer is of a special type, and it is recommended that you get ALL of your extension cables from Neoptix or a Neoptix authorized distributor.

To install or remove, simply unscrew the two retaining screws with a screwdriver or bare-hand. Pull out the module and install a new one. Do not leave a slot without a cover; if required, install a blank cover. OmniModules can be installed and removed without powering off the chassis.

## 4.2 Display description

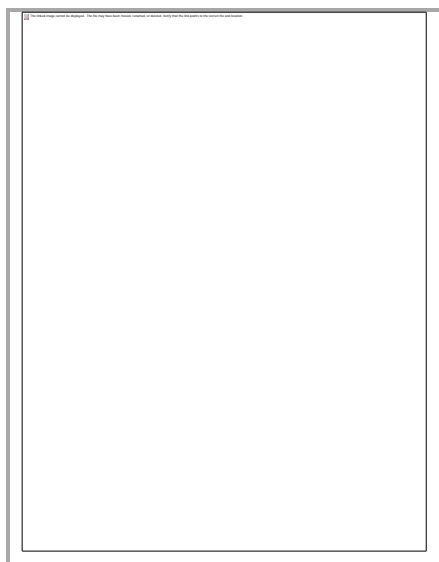
This OmniFlex-2 includes a local color and touch display where it is possible to perform some basic setup operation and to view data as it is acquired. This display is intended to be used only for doing basic parameter adjustments, such as setting up an IP address prior to connecting the OFX2 chassis to a computer.

After some seconds, an informative screen will be briefly displayed. At the bottom of this screen, you can find information about firmware versions that are currently active in this OmniFlex instrument.

Then the main screen will be shown. This screen is organized in 5 logical horizontal regions:

- The top portion gives general information to the user, such as time and date.
- The central portion of the screen displays the OmniModule configuration and presence. Touch one of the modules to view its corresponding readings.
- Logging activity status and logging rate if applicable.
- The bottom portion shows four icons that can be invoked to further configure your thermometer, or to give you access to more advanced menus.

The display is illustrated below:



Date, and other information.

Touch a module to get more details about that specific OmniModule.

Note: If you have a 6U chassis, 13 modules will be shown.

Note: The color of each ST connector indicates activities on that channel<sup>1</sup>.

Logging status (if active).

Configuration icons.

Note: The Logging button is green when logging is active.

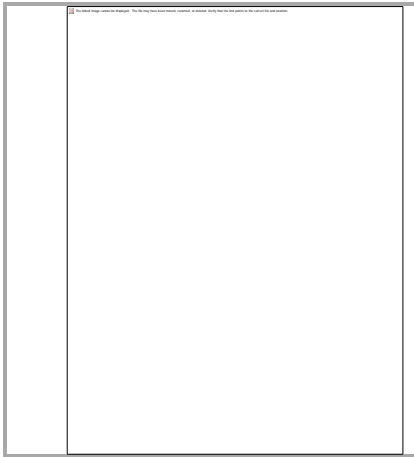
If the screen is not touched for at least one hour, it will enter into a “screen saver” mode; to go back to the normal intensity, simply touch the screen anywhere.

## 4.3 Touch screen operation and setup menu

The touch screen is very simple to use. The touch technology used for the *Nomad-Touch* is resistive touch layer. This means that the menu selection can be done by anything that can apply a small pressure on the display surface; this pressure can be applied by naked fingers, gloves, stilettos, etc. The setup menu can be used to get information about your system, and in particular its current Ethernet IP address, which is necessary to know in order to connect the OFX2 to a computer. This menu is illustrated below; a description of the various options is also presented.

<sup>1</sup> All ST connector icons can take any of these 4 colors:

- Green:** Probe is giving a valid temperature, with a strong optical signal
- Yellow:** Probe is giving a valid temperature, with a weak optical signal. Note that the “wtune” feature must be activated to get the “yellow” color.
- Red:** Probe is not connected or broken
- Grey:** Channel is disabled.



System name can be entered in the web pages.

Chassis serial number is for information only.

IP address is used to connect to a computer, using an Internet browser. IP address can be static or dynamic (DHCP server). The default static IP address is 10.0.0.4, but can be changed later when you are connected to a browser.

This will reset the webserver user name and password to “neoptix” and “pass”. Hold the button for at least 1 second to activate.

Return to main screen.

#### **4.4 The module menu**

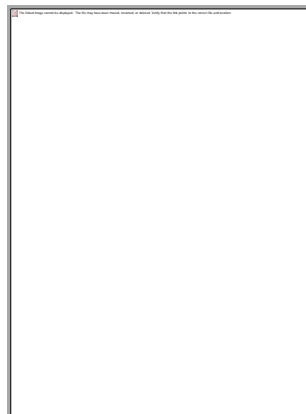
You can invoke this screen whenever an OmniModule icon is touched on the main screen. Then, you will get specific information regarding that particular OmniModule, as shown below. Each ST connector color is set according to the optical signal strength for that channel. Furthermore, the real-time temperature value is indicated for each of the optical channel, up to a total of 8 channels.



See section 4.2 for an explanation on the meaning of the connector colors.

#### **4.5 The logging menu**

Your OmniFlex-2 system includes a very useful temperature-logging feature. The logged data is internally stored as binary files. The files consist of up to 65,000 lines of data, each line representing the temperature for all enabled channels along with a date-time stamp. Total logging memory is approximately 7 GB, which will give you the possibility to log millions of temperature points. The files are directly readable by Microsoft Excel. You must use the web server to download the data files. This screen is shown here:





The logging rate can be set to any of these discrete choices:

- 0.1, 0.2, 0.5, 1, 2, 5, 10, 30 seconds
- 1, 2, 5, 10, 30 minutes
- 1, 2, 4, 12, 24 hours.

The “Logging” button on the main screen will turn green (instead of red) when temperature logging is enabled.

Warning: The “Download Logs to USB” functionality is not implemented at this time.

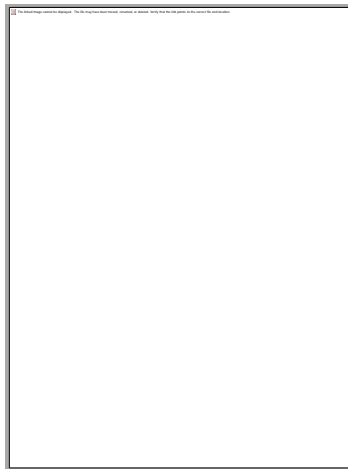
#### **4.6 Real-time data viewer**

A convenient real-time viewer (button Data View) is available. It gives the temperature on each probe, along with signal strength information for each one of them. A total of up to 104 channels can be displayed. Use the slider on the right of the screen to move around all channels.

The channel field (at the left of the screen) contains the channel number information, and is presented this way:

- The first number is a linear indicator, from 1 to 104
- The first number inside the parenthesis is the module number, 1 to 6 or 1 to 13
- And the last number, also inside the parenthesis, represents the channel number for this module.

The data viewer looks like this:



Please note that this is only a real-time data viewer, which is showing the last temperature value that has been acquired for a specific channel. To view the logged temperature data, one must use the web server and download data files; see section 6.2.

## 5 USING THE TEMPERATURE PROBES

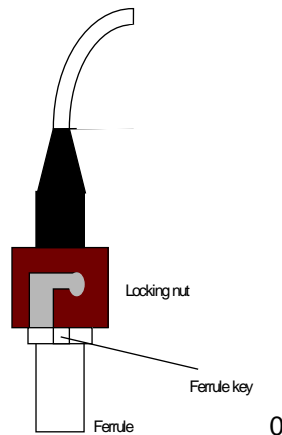
### 5.1 Caution

Each time you connect a temperature probe to the unit, the probe **optical connector should be cleaned beforehand**. Otherwise, particles of grease or dirt may obstruct the device internal connector and affect the measurements by completely blocking the signal or by generating too much attenuation when using a long fiber length.

Never use a cloth other than the type recommended for fiber optic cleaning. Dampening the cloth with pure isopropyl alcohol ensures good cleaning.

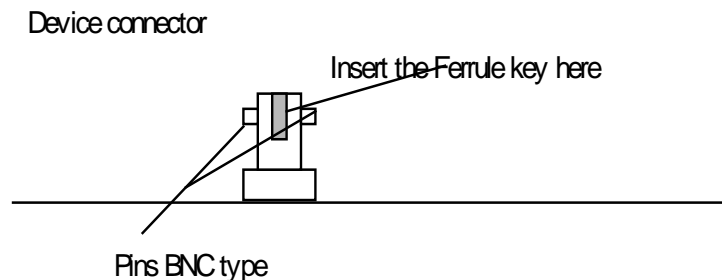
Occasionally, clean the inside of the bulkhead connector (attached to the thermometer) with a wipe or cotton swab dipped in alcohol (2.5 mm mini foam swabs work best).

Very dirty connectors could occasionally be cleaned using a strong solvent such as acetone (acetone is strong solvent, must be used with care). After using acetone, you should remove any deposits left by the acetone, using some isopropyl alcohol, as indicated above.



### 5.2 Description

The optical connector used is a standard ST type connector.



To install the connector,  
Slide the ferrule key gently into the above key.  
Then, turning, insert the two BNC pins into  
The appropriate slots on the ST connector

### 5.3 Warning

The T1 probe is quite fragile and it must be handled carefully. Please note that any probe damages are not covered by the standard warranty.

The probe tip is made of silicone rubber. Although silicone is resistant to a large number of chemical aggressors, strong acids or alkali may damage it, especially at high temperature and/or if used for extended periods of time. Warning: Solvents and fuel oils can cause problems for silicone rubber.

Neoptix also manufactures probes that have their tips made of epoxy. Just like silicone, epoxy resin is resistant to a large number of chemical aggressors, strong acids or alkali may damage it, especially at high temperature and/or if used for extended periods of time.

Contact your distributor for additional chemical compatibility information.

Do not expose your probes to temperatures that are higher than specified. Permanent damage can be caused to probes that have been exposed to temperatures that are higher than their limits.

#### **5.4 Working with long probes**

This note is important when using probes or extension cables that have a combined length of 100 meters or more. Working with long probes or extension cables presents special problems. To limit the amount of back reflection caused by the fiber optic connector located on the thermometer unit, you may have to use a matching gel optical couplant in the connector. This gel is a grease-like compound with high clarity, good resolution properties and a refractive index close to quartz. Apply the gel onto connector end faces.

Avoid disconnecting the connectors for which gel has been used. In other words, it is recommended to use the gel only for permanent installations. If the connectors are disconnected many times, you may have to clean entirely the connector assemblies that have had the gel; this may require opening the instrument enclosure to remove the excess gel.

Note that it is not required to use this gel with connectors that are far away from the thermometer electronic unit.

#### **5.5 Working with cryogenic probes**

The use of a cryogenic probe requires special attention. In particular, the probes become more brittle at very low temperatures. Avoid cycling the probes quickly between cryogenic temp and ambient temperatures, as this may cause material fatigue at the probe tips.

#### **Warning**

Always wear protective gloves and clothing when working with cryogenic material.

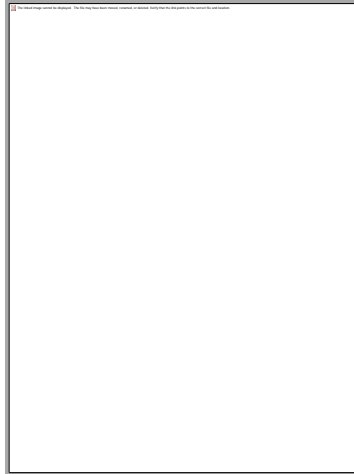
Never use general purpose probes at cryogenic temperatures. Neoptix sells special probes that can be used at cryogenic temperatures.

Please note that your OmniFlex thermometer will require a special factory calibration to be used at cryogenic temperatures (below  $-80^{\circ}\text{C}$ ). Consult Neoptix for more information.

## 6 QUICK INTRODUCTION

This Chapter deals with the basic software operation of your new OmniFlex-2 instrument. Here, you will find information about preparing the unit and doing initial measurements. The detailed reference instructions are given in the next Chapter.

Your OmniFlex-2 comes calibrated and ready to use. Connect a suitable power supply (nominally 24 VDC at 2.5 A, or more); preferably, you should use the Neoptix supplied table-top power module. Turn on the power switch, and the unit should come alive after about 30 seconds (this is the time it takes to the Linux-based inside firmware to boot). After a few “splash” screens, the local LCD display will look like this:



For the next step, we suggest that you connect your OmniFlex-2 to a computer, either a PC or a Mac, using an Ethernet link. Basically, the unit can be connected via Ethernet using one of many strategies. Three of them are described here<sup>2</sup>:

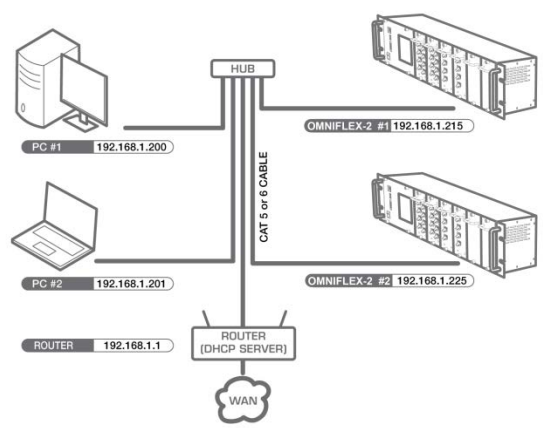
- a) You connect the OmniFlex-2 through your organization network topology. Using this approach, everyone in your organization can access it. This type of connection would normally be done through an Ethernet intelligent hub (and/or router), fitted with a DHCP server.

**Warning:** For security reason, this approach is **NOT** recommended, as everyone on the network could have easy access to the OFX2. Neoptix recommends using a “private” network, as described later in this chapter.

This is illustrated here:

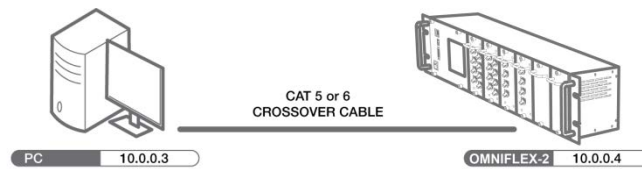
---

<sup>2</sup> For all configurations, your proxy server should be disabled (if you are using one).



- b) You connect the OmniFlex-2 through a dedicated Ethernet interface and cable, using a “private” network arrangement. Furthermore, to keep your organization network operational at the same time, you will need an additional Ethernet interface / adapter, such as a USB to Ethernet device (this can be purchased for a nominal fee at any computer store). This has the advantage of keeping the OFX2 isolated from all outside networks and thus will provide the best security scheme.

This approach is illustrated here:

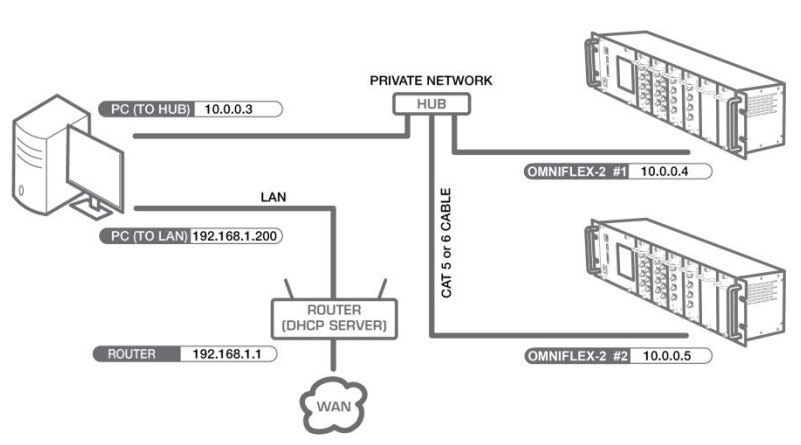


- c) If you want to connect more than one OmniFlex-2 systems through a dedicated Ethernet network, the best option is to use a hub that would link all the OFX2 units together along with your computer.

To set the IP address to any other values than the default 10.0.0.4, which will be absolutely necessary if you want to connect more than one OFX2 chassis and if you are using the fixed IP address strategy, you will need to first set up the IP addresses of all chassis *one* by one. This procedure is recommended:

- Make sure only *one* chassis is connected to your PC. Physically disconnect all others.
- Login to that module using that the IP address 10.0.0.4, using a suitable Internet browser; go to the setup menu, change the IP address to a unique address and reboot the OFX2 chassis.
  - As the IP mask is always 255.255.255.0, it is imperative that all IP addresses fall in this range: 10.0.0.1 to 10.0.0.254.
  - Warning: The IP addresses all chassis must be different that the IP address of your PC Ethernet interface. The Neoptix suggested IP address for your PC interface is 10.0.0.3, as explained below.
- Repeat this operation for all the OFX2 chassis that you want to connect.

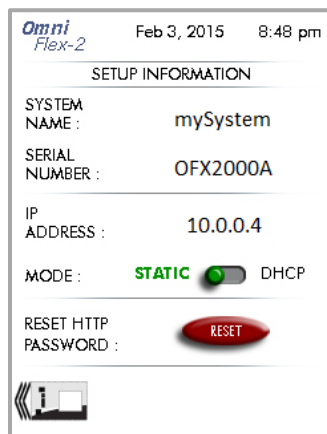
This approach is the Neoptix “factory default” (private network). This is illustrated here:



## 6.1 Setting up a private network, using a static IP address

This section includes some information on how to set the network parameter, using a static IP address (private network). Here, you will connect your PC directly to the OmniFlex-2 using a “crossover” Ethernet cable<sup>3</sup>, as illustrated in the “b)” figure above.

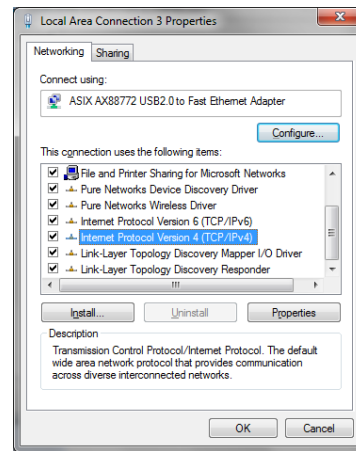
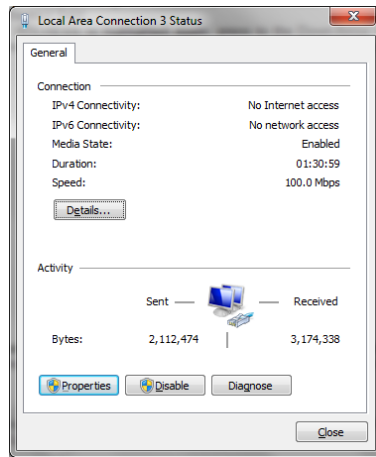
We will assume here that the IP address of your computer Ethernet interface will be set to 10.0.0.3<sup>4</sup> and the IP address of the OmniFlex-2 will be 10.0.0.4 (default value). You can confirm the IP address of your OFX2 chassis by touching the “Setup” icon on the LCD main screen, and you will get this:



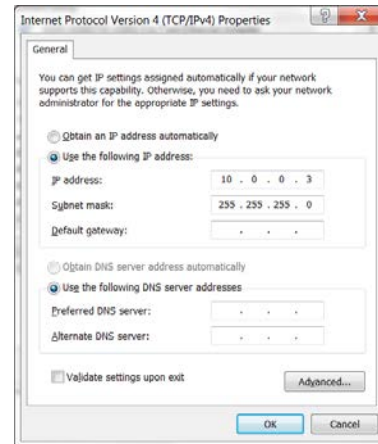
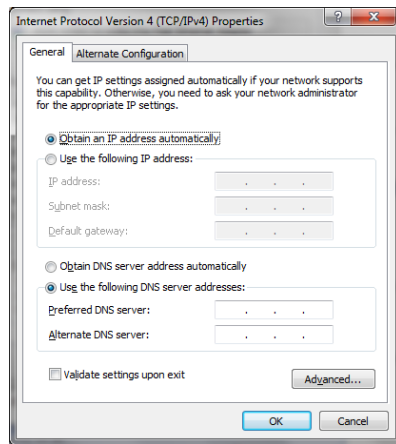
Next, you need to make sure your PC computer is also set to work with a static IP address, which should be 10.0.0.3. For this, you need to open the Windows Local Area Network window, as shown here:

<sup>3</sup> If using a recent (built after 2010) PC, a crossover cable may not be required, as the newer PCs have Ethernet interfaces that can auto-detect Ethernet signal flow direction.

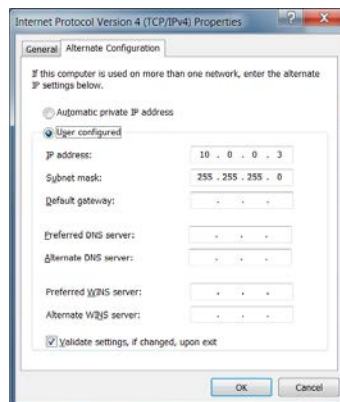
<sup>4</sup> For more information regarding IP address selection, please visit [http://en.wikipedia.org/wiki/IP\\_address](http://en.wikipedia.org/wiki/IP_address).



And then open the Properties window. Highlight “Internet Protocol Version 4” and click Properties; you should get the following window (left). Select the “Use the following IP address” button, and enter the information as shown in the figure on the right, below:



Alternatively, you can also enter a fixed IP address using the “Alternate Configuration” tab shown in the above left picture. By doing so, it would be easier to switch back and forth between a DHCP enabled configuration (such as would be required in an office environment) and a fixed IP configuration (such as would be required to directly interface with a OFX2 system). This is illustrated here:



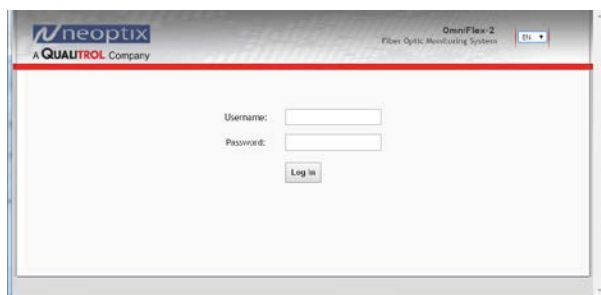
Close all windows.

If you have problems connecting to the Ethernet, or to understand the parameters in the above windows, you should contact your Local Network Administrator for help.

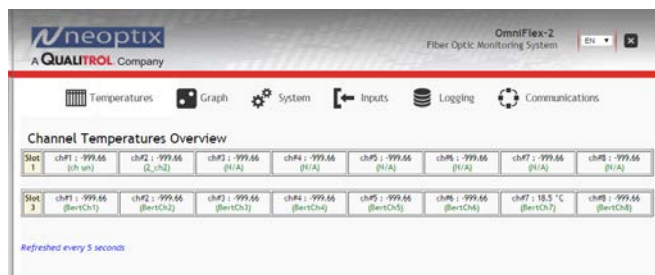
Alternatively, you can also work with a dynamic IP address (DHCP server), even if you are connected directly to your OmniFlex-2; this can be done by installing a shareware in your PC, which would act as a private DHCP server. Neoptix has successfully used “DHCP Server for Windows” (can be downloaded from <http://www.dhcpserver.de/cms/download/>). The readme.txt file gives instructions on how to use this very useful program (in particular how to set a range of searchable IP addresses, IPPOOL\_1 variable). Warning: Do not install as a service!

## 6.2 Working with your Internet browser

Start your compatible<sup>5</sup> web browser. In the address bar, enter “10.0.0.4”. The first page you will see is the login page. The default username and password are “neoptix” and “pass”; these can be changed later. This page is shown here:



The following page is the Home page, as follows (with 2 installed OmniModules, in slots 1 and 3):



By default, all parameters have preset values that are normally compatible for most applications<sup>6</sup>. You are free to change any parameters as you wish; however, for now it is suggested to leave all parameters to their default values.

From this point, you are free to explore the various options offered by the OmniFlex-2 webserver. The rest of this chapter shows some functionality that would be useful for most users, but is by no means an obligation to anybody to follow.

**Warning:** As this is a preliminary user guide, some functionality may not all be implemented at this time.

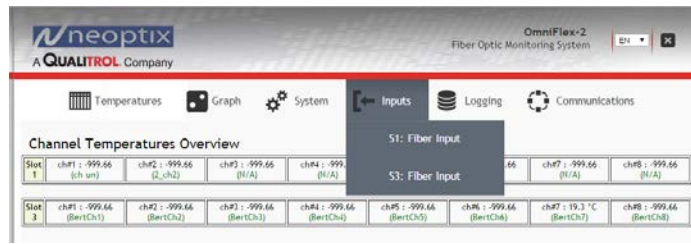
As a next step, you might want to know more details about each channel. For that, click the “Inputs” icon, and then you can select one of the OmniModule names, S1 and S3 in the example below.

<sup>5</sup> The following browsers are supported:

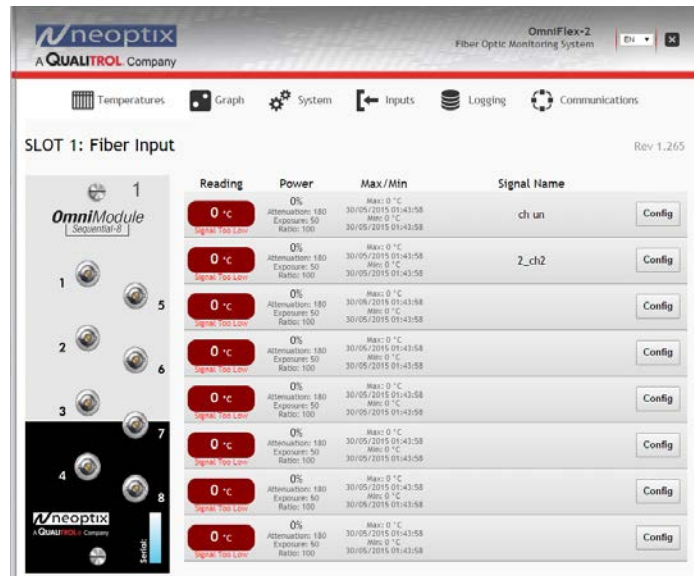
- Microsoft Internet Explorer version 7 and above
- Mozilla Firefox version 3.6 and above
- Google Chrome
- Apple Safari.

<sup>6</sup> For power transformer applications, it is highly recommended to ensure that the “wtune” parameter is active. This parameter should be “disabled” at the expense of having a less sensitive system, for applications where acquisition speed is required (less than 10 seconds).





Here is a typical representation of the information concerning the OmniModule S1 (with no probes connected):

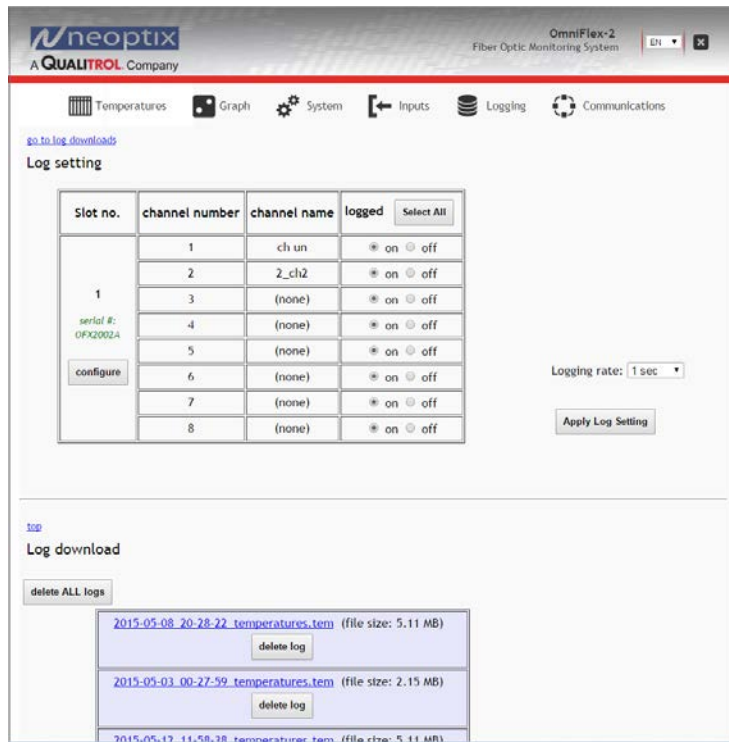


Click the “Config” button for each channel to add more information regarding this channel.

Click the “Logging” icon to access to the temperature logging menus and logged file download. The Logging window is shown below. As you can see, this window has 2 functions:

- 1- Logging parameters. You can enable or disable the logging for each channel, and you can set the logging rate<sup>7</sup> to your liking.
- 2- The second section presents a list of data files, with logged data. Click a file name to download it. You can also delete any of these files.

<sup>7</sup> The logging rate can be set as fast as 10 samples per second; However, this fast rate may not make sense for all configuration, especially if you are using sequential OmniModules; indeed, these modules have an acquisition rate which is about 0.25 sec per enabled channel, so their actual optical refresh rate can be as slow as one per 2 seconds. For speed optimization, you should disable any unused channels.



One more interesting feature could be the graphing capability of your OmniFlex-2 system. This real-time graphing feature can be accessed by clicking on the “Graph” icon. You will get a real-time graphing that looks like this:



You are free to explore the other features of the OmniFlex software. Refer to the next chapter for a more complete description of this software.

**Neoptix Canada LP**

1415, rue Frank-Carrel, Suite 220  
Québec City, QC  
CANADA G1N 4N7

Tel: 418-687-2500  
Fax: 418-687-2524

[www.neoptix.com](http://www.neoptix.com)

[www.qualitrolcorp.com](http://www.qualitrolcorp.com)

[support@neoptix.com](mailto:support@neoptix.com)

Printed in Canada