

EtherTAP2 Manual

User manual for:
EtherTAP2 10/100
EtherTAP2 1G

Safety Guidelines

This manual contains notices which you should observe to ensure your own personal safety, as well as to protect the product and connected equipment. These notices are highlighted in the manual by a warning sign and are marked as followed according to the level of danger:



Draws your attention to important information on handling the product, a particular part of the documentation or the correct functioning of the product.

Warning

This device and its components may only be used for the applications described in this manual and only in connection with devices or components that comply with Industrial Ethernet interfaces. This product can only function correctly and safely if it is transported, stored, set up, installed, operated and maintained as recommended. Atlas and/ or Mercury is a CE class A product. In a domestic environment it may cause radio interference in which case the user may be required to take adequate measures.

Warranty

Warranty is void if you open the EtherTAP2.

Qualified Technicians

Only qualified technicians should be allowed to install and work with this equipment. Qualified technicians are defined as persons who are authorized to commission, to ground, to tag circuits and systems in accordance with established safety practices and standards. It is recommended that the technicians carry a Certified PROFINET Installer or Certified PROFINET Engineer certificate.

Disclaimer of Liability

We have checked the contents of this manual as much as possible. Since deviations cannot be precluded entirely, we cannot guarantee full agreement. However, the content in this manual is reviewed regularly and necessary corrections will be included in subsequent editions. Suggestions for improvements are welcome.

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Important information

Purpose of the Manual

This user manual provides information how to work with EtherTAP2 10/100 and EtherTAP2 1G.

Support

In case of a defective product or unanswered questions, please get in contact with the support department:

T: +31 (0)174 671 800
F: +31 (0)174 671 801
E: support@procentec.com

Recycling and Disposal

The parts of the EtherTAP2 can be recycled.

For further information about environment-friendly recycling and the procedure for the disposing of your old equipment, please contact:

HMS Industrial Networks
Vlasmarkt 1
3011 PW, ROTTERDAM
The Netherlands

T: +31 (0)174 671 800
F: +31 (0)174 671 801
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Document Updates

You can obtain constantly updated information on Anybus products on the Internet at www.anybus.com

You can also contact HMS Technical Support:

- by phone at +31 (0)174 671 800
- by fax at +31 (0)174 671 801
- by email at support@procentec.com

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1. Introduction

The EtherTAP2 is an interface to utilize monitoring of an Ethernet network. It is an essential tool for Industrial Ethernet engineering and commissioning activities, especially to verify the connections and performance of RT, IRT and other real-time applications. There are two types; a 10 / -100 Mbit/s type and a 1000 Mbit/s (or 1Gbit/s) type.

The monitor port of switches is unreliable for monitoring; it can be occupied, not forwarding all the traffic or drop messages due to overload of the switch. Also, the load on the Ethernet port of the laptop can also be too high with real-time applications because 2 channels are merged in one. The EtherTAP2 has a USB link with the monitoring device (such as Atlas) that streams the captured messages to the accompanying driver which emulates an additional Ethernet port on the Atlas and hands the messages over to any application.

The EtherTAP2 also prevents the Atlas to send out messages on its own initiative, which could jeopardize the real-time behavior and security of the network.

EtherTAP2 cuts down the equipment needed for Network Analysis, even reducing the points of failure during analysis. Only an Atlas, Mercury or a PC and one EtherTAP2 are needed. The power is supplied by the USB3.0 connection. No extra adaptor is required but can be connected optionally to provide extra power if the USB power is insufficient, or if higher availability is required.

In this manual you will find everything you need about how to install and use the product and the provided software.

EtherTAP2 10 / 100 visual description

LEDs:

- 1 LED to indicate power
- 2 LED to indicate a working USB connection
- 3 Green LED to give information about ETH1 connection status
- 4 Green LED to give information about ETH2 connection status
- 5 LED to indicate a 10 Mbit/s or 100 Mbit/s connection (5 ON = 100 Mbit/s)
- 6 LED to indicate a 10 Mbit/s or 100 Mbit/s connection (6 ON = 10 Mbit/s)

Connectors:

- 7 USB3 Standard B connector for connection to the monitoring device
- 8 Ethernet port 1 (RJ45) connected to the network, up to 100 Mbit/s
- 9 Ethernet port 2 (RJ45) connected to the network, up to 100 Mbit/s
- 10 An optional power input for 12 - 24 V/0.5A for uninterrupted power supply.



Figure 1: Identification of connections and LEDs for the 100 Mbit/s version

EtherTAP2 1G visual description

LEDs:

- 1 LED to indicate power
- 2 LED to indicate a working USB connection
- 3 LED to give information about ETH1 connection status
- 4 LED to give information about ETH2 connection status
- 5 LED to indicate a 10 Mbit/s or 100 Mbit/s connection (5 ON = 100 Mbit/s)
- 6 LED to indicate a 10 Mbit/s or 100 Mbit/s connection (6 ON = 10 Mbit/s)

Both 5 and 6 ON = 1000 Mbit/s



Figure 2: Identification of connections and LEDs for the 1Gbit/s version

Connectors:

- 7 USB3 Standard B connector for connection to the monitoring device
- 8 Ethernet port 1 (RJ45) connected to the network, up to 1000 Mbit/s
- 9 Ethernet port 2 (RJ45) connected to the network, up to 1000 Mbit/s
- 10 An optional redundant power input for 12 - 24 V/0.5A for uninterrupted power supply.

2. Installation instructions

2.1 Hardware & driver installation

The Atlas, Atlas2 and Mercury come pre-installed with drivers for the EtherTAP2. No further installation is required. Just connect your tap to the USB 2.0 of your Atlas or the USB 3.0 of your Atlas2 or Mercury, and start monitoring your network with Osiris.

If you wish to use the EtherTAP2 on a laptop or PC, you can follow the driver installation instructions below.

2.1.1 PC Installation: Insert the USB drive or download the driver package

Insert the supplied USB drive for accessing/copying the contents to an installation folder. It is recommended to copy the contents to your hard disk first, if there is no empty USB2.0 port available. After copying you may disconnect the USB key and proceed. Otherwise use the USB key for installation procedure and decide to connect the EtherTAP2 to a USB3.0 port and remove USB key when finished.

If you do not have the USB drive, download the driver package from our website:

<https://support.procentec.com/downloads/software-firmware/>.

Register your personal data to access the download area. Registering is free and keeps you informed of product updates.

2.1.2 Connect EtherTAP2 to the network

Connect the EtherTAP2 to the network using Category 5e FTP or STP (Foiled or Shielded Twisted Pair) cables. UTP (Unshielded Twisted Pair) cable is not recommended in industrial environments.

Network Port A: to DCE by straight Cable / to DTE by cross-over cable.

Network Port B: to DTE by straight Cable / to DCE by cross-over cable.

The maximum distance between any of the connected devices is 100 meters.

2.1.3 Connect the USB port

Connect the USB port to a PC/MAC USB3.0 port and the green Power LED will illuminate. The cable length should not exceed 5 meters. The EtherTAP2 100 type can be connected to a USB2.0 or USB3.0 port.

When you plug in the USB cable, but both RJ45 ports are not connected yet, then both network speed LEDs should blink every second.

When both RJ45 ports are connected to a link, you will see both 'Link/Activity' LEDs illuminate. When any data is received, these LEDs will blink on the respective port.

IMPORTANT NOTE:

Due to the Gigabit Ethernet design, The 1G version of EtherTAP2 requires the USB power for correct connection between the two RJ45 connections. This means that if the USB connector is removed, or the computer goes to sleep mode for example, the connection on the Ethernet link will be lost for 1 to 2 seconds! The EtherTAP2 100 does not require USB to maintain Ethernet connection; in case of

disconnection of the USB link the Ethernet communication will continue without interruptions. See 2.1.4 for more information.

2.1.4 External power

The 1-/100 Mbit EtherTAP2 has one external power input for 12 to 24 VDC to power the LEDs in case of USB failure.

The 1G E EtherTAP2 has two redundant power inputs for the same purpose, but as stated in paragraph 2.1.3, it also provides stability for the gigabit Ethernet connection. In case of USB connection issues, this event will not affect the ethernet link when the EtherTAP2 is externally powered.

2.1.5 Install the driver

Install the driver according to your Operating System. The current available drivers are located on the USB key at the driver section or within your installation directory on your hard disk.

Supported O.S. are:

Windows 7 / 8 / 10 (32 bit & 64 bit)

MAC OS

Linux

Please check the latest driver released for your Operating System in the User Section at <https://support.procentec.com/downloads/software-firmware/>. Register your personal data to access the download area. Registering is free and keeps you informed of product updates.

After choosing the driver installer for your Operating system, simply run the installer and follow the installation instructions.

After installation, a restart may be required for Windows machines.

2.1.6 Install Npcap

To transfer the packets to the higher level operating system, you must install Npcap 0.995 or higher on your computer. Download it on www.nmap.org/download.

2.1.7 Setup the EtherTAP2 Network Adapter

After the installation, the EtherTAP2 presents itself as a virtual Network Adapter to your Operating System and to any Analyzer.

The below settings are for internal communication only - there is no external effect nor are these settings presented or exposed to the monitored link.

In any case we recommend setting an IP address. The installed TAP driver (as under paragraph 2.1.4) is represented as a Network Adapter to your Operating System.

Notes:

Configure the IP Protocol Stack:

IP address: **192.168.0.1**

Subnet mask: **255.0.0.0**

Note: Gateway or DNS settings must be undefined.

The EtherTAP2 is now ready to use as source for your installed Analyzer.

2.2 Analyzer Setup

To perform analysis you can use either the powerful Osiris platform or any of the supported analyzers such as Wireshark.

2.2.1 Selecting EtherTAP2 as source for your Analyzer

Start your preferred Analyzer and select the new virtual device showing up at the "select NIC" window. Refer to your Analyzer's manual or the User Help about how to select a Network Interface Card.

2.2.2 Using alternative Wireshark

As an option you may install an alternate Analyzer.

Notes:

- Always follow the specific instructions as indicated by the installation manual/wizard of the chosen Analyzer.
- In addition, perform step 2.2.1 to enable EtherTAP2 to be the selected resource for Analysis.
- Make sure to use the latest available version if any problem occurs with EtherTAP2. For the latest version, refer to <https://procentec.com/service-support/software-firmware/>

3. EtherTAP Manager

The installer that comes with the drivers also installs a tool called ProfiShark Manager. This tool allows you to change behavior of the EtherTAP2. The most important settings are the ‘Capture settings’ in the Features tab:

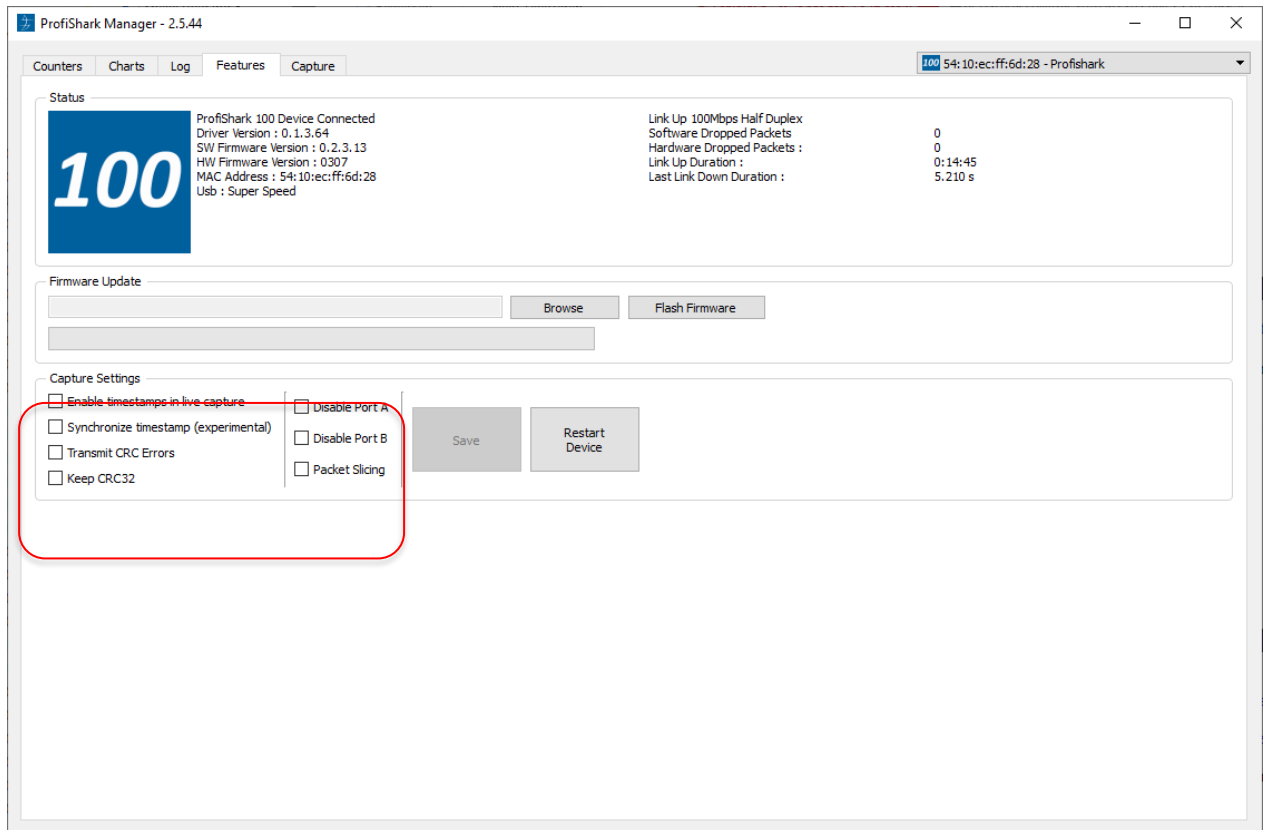


Figure 3 – Settings for Wireshark analysis.

3.1 Features tab

The following configurable options/settings are available:

- Timestamp enable/disable
- Transmit CRC errors
- Keep CRC32
- Disable port A and/or port B
- Packet slicing

Timestamp enable/disable (unchecked and disabled by default)

If checked, a Unix formatted timestamp is appended in the header of the packet data. This timestamp can be interpreted by the Profitap Wireshark dissector in Live Capture mode.

Transmit CRC errors (unchecked and disabled by default)

You may decide to keep packets corrupted by a CRC error. Deselect the checkbox ‘Transmit CRC errors’ to include those packets upstream to the Analyzer during your analysis.

Keep CRC32 (unchecked and disabled by default)

If checked, the CRC32 information (32-bit Frame Check Sequence) located at the end of the packets will be kept in the capture. FCS can be interpreted in Wireshark (Edit \ Preferences \ Protocols \ Ethernet \ Assume packets have FCS).

Disable port A and/or port B (unchecked and disabled by default)

If checked, frames from port A or B will not be captured.

Packet slicing (unchecked and disabled by default)

Enabling this feature will result in dropping the payload of every frame captured, keeping only the header information (the first 128 bytes) up to the application layer.


3.1.1 Firmware update

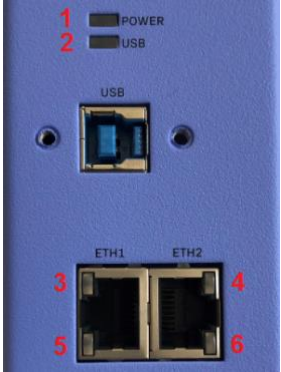
The tool can automatically check and update the firmware of the EtherTAP2 for you. If the EtherTAP2 is connected to your computer, and if the computer has an Internet connection, it will perform an update automatically. Simply confirm the dialog box.

Manual checking of the firmware, and updating it, is also possible.

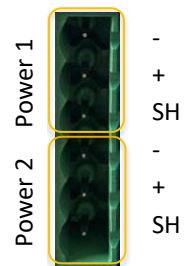
3.2 Capture tab

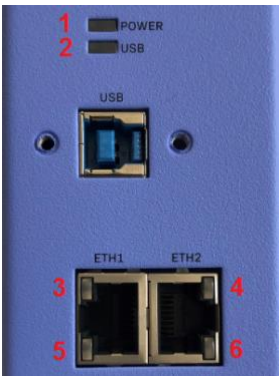
The EtherTAP2 can capture traffic without the need for third-party capture software. This Direct Capture is performed at the driver level, prior to all network stacks and frame processing. Direct Capture provides the best performance for traffic capture. If Live Capture performance proves to be insufficient (e.g. software packet drops when attempting to capture many small packets), using Direct Capture will solve the issue. The Capture tab contains the controls for the Direct Capture feature. The captured data is saved to a PCAP Next Generation file (.pcapng) with hardware-generated packet timestamps.

EtherTAP2 10-100M Technical Data	
Dimensions, weight and mounting	
Dimensions W x D x H (mm)	52 x 130 x 120 (DIN-Rail clip <i>included</i> ; <i>plug-able connectors as mounted in installations excluded</i>)
Weight	440 grams (<i>excluding plug-able connectors, packing material</i>)
DIN-rail	35 x 7.5 mm (IEC/EN 60715)
Ambient conditions	
Operating temperature range	-20° to +60° Celsius
Storage and shipping temperature	-20° to +85° Celsius
Relative air humidity	Max. 98%, non-condensing
Ingress protection	IP 20 (IEC/EN 60529, DIN 40 050)
Power supply	
Maximum power use	Max. 2.6 W
Powered from USB port	Yes <i>Connect the second power supply if the USB power supply is not sufficient.</i>
Nominal power supply USB	5 VDC
Current consumption USB @5 VDC	Max. 520 mA at 10 Mbit/s (Full Traffic) Max. 450 mA at 100 Mbit/s (Full Traffic)
Nominal power supply Secondary	12 to 24 VDC
Current consumption Secondary @12 VDC	Max. 220 mA at 10 Mbit/s (Full Traffic) Max. 190 mA at 100 Mbit/s (Full Traffic)
Reverse polarity protection	Yes
Pluggable power supply connector	Yes Pin - : 0 V Pin +: 12 to 24 VDC Pin SH: Shield
Wire diameter	Max. AWG 14 (<i>max area 2.5 mm²</i>)
	
	<p>Installation notes:</p> <p>The device shall be powered with a correct power supply:</p> <ul style="list-style-type: none"> • For North America the power supply shall be listed and meet the requirements for class 2 • For the rest of the world the power supply shall meet the requirements for limited power sources as defined in IEC/EN 60950-1 cl. 2.5 <p>Possible power supplies: Phoenix STEP-PS series Traco power TCL series XP-power DNR120-480 series</p>

Ethernet	
Connector ETH1 and ETH2	RJ-45
Maximum cable length	100 m
Link speed	10/100 Mbps
Network Link	Galvanically separated
Network Latency	10Mbps: max. 6600 ns 100Mbps: max. 660 ns
USB Ports	
Port type	USB3.0; Port type B
LEDs	
Power LED (1)	On: Power Ok
USB LED (2)	Off: No USB cable connected On: USB cable and USB power connected Blinking: Constant synchronization between system time and hardware timestamp.
Link/Activity LEDs (3,4)	On: The Ethernet Port is linked Blinking: The port is linked and has RX/TX activity (traffic is passing through).
Speed LEDs (5,6)	LED5 On: Operating at 100 Mbps. LED5 Blinking: EtherTAP is Initializing. LED6 On: Operating at 10 Mbps. LED6 Blinking: EtherTAP firmware corrupted. LED5,6 Blinking: EtherTAP is not connected or trying to connect. LED5,6 Alternate Blinking: EtherTAP cannot find a common speed between the connected devices.
	
System requirements	
System type and Operating system	Atlas, Atlas2 Plus; Linux PC: Dual Core Processor, 4 GB memory, USB3.0 port; Windows 7/8/10 (32-bit & 64-bit)
Standards and Approvals	
CE	EMC Directive 2014/30/EU, class A RoHs Directive 2011/65/EU Emission: CISPR32 Immunity: CISPR35
FCC	47 CFR 15 & ICES-003 (Issue 6), class A

EtherTAP2 1G Technical Data	
Dimensions, weight and mounting	
Dimensions W x D x H (mm)	52 x 130 x 120 (DIN-Rail clip <i>included</i> ; <i>plug-able connectors as mounted in installations excluded</i>)
Weight	465 grams (<i>excluding plug-able connectors, packing material</i>)
DIN-rail	35 x 7.5 mm (IEC/EN 60715)
Ambient conditions	
Operating temperature range	-20° to +60° Celsius
Storage and shipping temperature	-20° to +85° Celsius
Relative air humidity	Max. 98%, non-condensing
Ingress protection	IP 20 (IEC/EN 60529, DIN 40 050)
Power supply	
Maximum power use	Max. 3 W
Powered from USB port	Yes <i>Connect power supply POW1 and/or POW2 if the USB power supply is not sufficient.</i> <i>Disconnecting the USB 3.0 cable also interrupts the connected Ethernet cables for 1-2 seconds.</i>
Nominal power supply USB	5 VDC
Current consumption USB @5 VDC	Max. 520 mA at 10 Mbps (Full Traffic) Max. 450 mA at 100 Mbps (Full Traffic) Max. 600 mA at 1000 Mbps (Full Traffic)
Nominal power supply POWER 1-2	12 to 24 VDC
Current consumption POWER 1-2 @12 VDC	Max. 220 mA at 10 Mbps (Full Traffic) Max. 190 mA at 100 Mbps (Full Traffic) Max. 250 mA at 1000 Mbps (Full Traffic)
Reverse polarity protection	Yes
Pluggable power supply connector	Pin - : 0 V Pin +: 12 to 24 VDC Pin SH: Shield Max. AWG 14 (<i>max area 2.5 mm²</i>)
Wire diameter	<u>Installation notes:</u> The device shall be powered with a correct power supply: <ul style="list-style-type: none"> • For North America the power supply shall be listed and meet the requirements for class 2 • For the rest of the world the power supply shall meet the requirements for limited power sources as defined in IEC/EN 60950-1 cl. 2.5 Possible power supplies: Phoenix STEP-PS series Traco power TCL series XP-power DNR120-480 series



Ethernet	
Connector ETH1 and ETH2 Maximum cable length Link speed Network Link Network Latency	RJ-45 100 m 10/100/1000 Mbps Galvanically separated 10 Mbps: max. 7600 ± 25 ns 100 Mbps: max. 720 ± 24 ns 1000 Mbps: max. 380 ± 8 ns
USB Ports	
Port type	USB3.0; Port type B
LEDs	
Power LED (1) USB LED (2) Link/Activity LEDs (3,4) Speed LEDs (5,6) 	On: Power Ok Off: No USB cable connected On: USB cable and USB power connected Blinking: Constant synchronization between system time and hardware timestamp. On: The Ethernet Port is linked Blinking: The port is linked and has RX/TX activity (traffic is passing through). LED5 On: Operating at 100 Mbps. LED6 On: Operating at 10 Mbps. LED5,6 On: Operating at 1000 Mbps. LED5,6 Blinking: EtherTAP is not connected or trying to connect. LED5,6 Alternate Blinking: EtherTAP cannot find a common speed between the connected devices.
System requirements	
System type and Operating system	Atlas, Atlas2 Plus; Linux PC: Dual Core Processor, 4 GB memory, USB3.0 port; Windows 7/8/10 (32-bit & 64-bit)
Standards and Approvals	
CE	EMC Directive 2014/30/EU, class A RoHS Directive 2011/65/EU Emission: CISPR32 Immunity: CISPR35
FCC	47 CFR 15 & ICES-003 (Issue 6), class A

