### ACCTETHNK – Ethernet adapter kit for CT/ CTlaser/ CTratio

#### Scope of Supply

- Ethernet interface board
- Ethernet adapter incl. 1 m connection cable
- Software CD or USB stick
- Cable gland M12x1,5
- Mounting screws, cable tie

#### EU Declaration

The product meets the provisions of the EMC Directive 2014/30/EU and the General Product Safety Directive 2001/95/EC.

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EMC General Requirements: EN 61326-1:2013 (Basic requirements) EN 61326-2-3:2013 Safety of measurement devices: EN 61010-1:2010

This product is in conformity with Directive **2015/863/EU** (RoHS) of the European Parliament and of the Council of 4 June 2015 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.



- The max. ambient temperature is 85 °C for the electronic box and 60 °C for the Ethernet adapter.
- The corresponding command list (CT-CTlaser-CTvideocommands-xxxx-xx or CTratio-commands-xxxx-xx) can be found in the installation folder of the software under *Commands*.

#### 1. Hardware Installation

Please plug the Ethernet interface board into the place provided, which is located beside the display. In the correct position the holes of the interface match with the thread holes of the CT box. Now press the PCB downwards and fix it using both M3x5 screws. Exchange the blind screw on the CT box by the cable gland and install the connection cable (interface board – Ethernet adapter). Make sure the wiring is correct according to the wire colours printed on the interface board.

Please connect the shield of the cable with the electronics housing (inside the cable gland).

# The CT unit needs a power supply for operation with at minimum 12 V.

Please connect the Ethernet adapter device with your network using an Ethernet cable.



#### 2. Network Installation

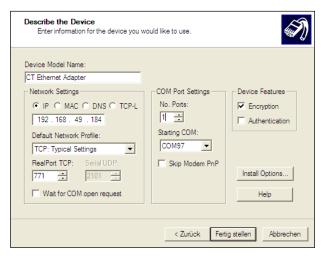
Insert the installation CD or the USB stick into the according drive on your computer. If the autorun option is activated the installation wizard will start automatically. Otherwise please start **CDsetup.exe** from the CD-ROM or via the USB stick. The following screen will appear. Please select **Install Ethernet Driver**. When using the USB stick, you will find the driver in the installation folder under *Driver* and *Ethernet*.



First of all you have to find out the IP adress oft he CT Ethernet adapter and change out of DHCP to a fix IP adress. For this case connect the CT Ethernet adapter to a DHCP-Server (e.g. your company network) and start the software *Digi RealPort Setup* 



Select Add New Device and press Continue.



The following screen shows all settings. Please press **Finish**.



To deinstall an adapter please follow the steps described under **Network Installation**. Select **Remove an Existing Device** and then **Continue**.

00:40:9D:4D:E	)A:10 C	T Ethernet Adapte	r
ealPort>			
Click here for help.			Refresh
	ealPort>	ealPort>	ealPort>

The IP- and MAC-address of the Ethernet adapter will appear in the list. You will find the MAC address also printed on the Ethernet adapter. Please mark the adapter in the list and press **Continue**.

Installing Digi RealPort Please wait while your Digi RealPort device	e is installed.		S)
Installing Multiport Serial device			
	< Zurijck	Fertig stellen	Abbrechen

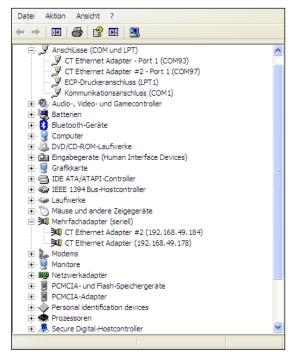
The device will be installed inside the network.

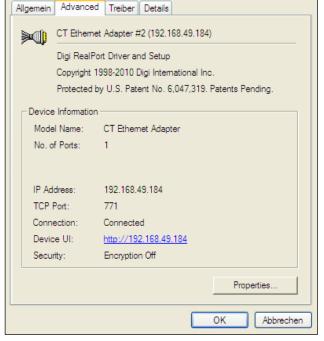
	s installed (	on your computer:		
Name	Δ		IP Address	MAC Address
🗺 СТ	Ethernet /	dapter (192.168.49.178)	192.168.49.178	00:40:9D:4D:DA:1
🚾 СТ	Ethernet /	dapter #2 (192.168.49.184)	192.168.49.184	00:40:9D:4D:DA:1
<				
			Deselect	All Select All

In the following overview all on the PC installed Ethernet adapter are shown. Select the adapter(s) which should be deinstalled and press **Continue**.

#### 3. Direct Connection to a PC

If a direct connection between Ethernet adapter and PC is required the adapter and the PC need to get a fixed IP address. After the network installation please open the Windows device manager (Start/ Control panel/ System/ Hardware/ Device manager).





Please choose **Multi adapter (serial)** from the list. By double click on the desired Ethernet adapter a properties window is opening.

Please open the tab **Advanced** in this window. Beside **Device UI** you will find a link with the network IP address.

In a case that the system will ask you for the password please use:

Favoriten 🖉 CT Ethernet Adap	oter Configuration and Man	agement			<b>11</b> •	🔊 · 🖃 🖶 •	Seite + Signemeit +	Extras +
	CT Ethern	et Ada	pter Co	nfiguratio	on and Ma	nagement		
ome	Home							😗 He
onfiguration Network Serial Ports GPIO	Getting Started		t to do next?	This Tutorial can	help.			
Alarms System Remote Management Users anagement	System Summa Model: IP Address: MAC Address:	CT Ether 192.168.	net Adapter 49.184 9:4D:DA:10					
Serial Ports Connections Iministration File Management Backup/Restore Undate Firmware	Description: Contact: Location: Device ID:	None None None 0000000	0-0000000-(	00409DFF-FF2BE	587			
Factory Default Settings System Information Reboot	User Interface Web Interface	(Default): interface:	Enabled	Set as Defaul	-			

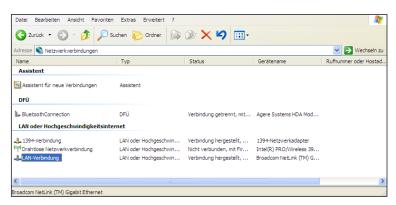
By clicking on the link the configuration page for the Ethernet adapter will be opened in your web browser. The PC must be connected to the internet for this purpose. Please select **Network** (Navigation left; below Configuration).

User : root please use: Pass : dbps

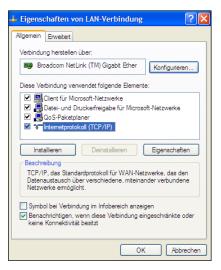
🖸 CT Ethernet Adapter Configu	ration and Management - Windows	s Internet Explorer		
🔆 🔄 🗢 🙋 http://192.168.49.	184/config/network/network_config.htm		💌 🗟 😽 🗙 🚼 Google	
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	CT Ethernet Adap	oter Configu	uration and Management	
Home	Network Configuration			8 Help
Configuration Network	▼ IP Settings	pn		
Serial Ports GPIO Alarms	<ul> <li>Obtain an IP address</li> <li>Use the following IP a</li> </ul>		DHCP =	
System Remote Management Users	* IP Address: * Subnet Mask:	192.168.49.184		
Management Serial Ports Connections	Default Gateway:	192.168.49.254		
Administration File Management Backup/Restore	* Changes to DHCP, IP add	ress and Subnet Ma	ask require a reboot to take effect.	
Update Firmware Factory Default Settings System Information	Network Services Settings     Advanced Network Setting			
Reboot Logout	<ul> <li>Advanced Network Setting</li> </ul>	12		
	Copyright	© 2003-2008 Optris G www.optris.	imbH All rights reserved. .de	
rtig			😜 Internet	👍 • 🔍 100% •

In the input mask below **Use the following IP address** you can now enter a fixed IP address. Confirm your settings with **Apply**.

For a communication with the adapter you now have to configure the network settings on your PC. Please open the LAN settings (Start/ Control panel/ Network settings/ Settings):



Mark the LAN connection and open the properties window (right mouse button)





2-Einstellungen können automatisch zu etzwerk diese Funktion unterstützt. W en Netzwerkadministrator, um die geei eziehen.	enden Sie sich andemfalls an
O IP-Adresse automatisch beziehen	
• Folgende IP-Adresse verwenden:	
IP-Adresse:	192 . 168 . 049 . 100
Subnetzmaske:	255 . 255 . 255 . 0
Standardgateway:	
	peziehen
<ul> <li>DNS-Serveradresse automatisch b</li> </ul>	
<ul> <li>DNS-Serveradresse automatisch b</li> <li>Folgende DNS-Serveradressen ver</li> </ul>	wenden:
	erwenden:
<ul> <li>Folgende DNS-Serveradressen ve</li> </ul>	erwenden:
<ul> <li>Folgende DNS-Serveradressen ver Bevorzugter DNS-Server:</li> </ul>	nvenden:

Please enter a fixed IP address here for the PC. Please note that the first three blocks have to match with the IP address of the adapter device (example: 192.168.049). Press **OK**. The installation is finished.

#### 4. Settings inside the software CompactConnect/ Compact Plus Connect

After a successful network installation of the Ethernet adapter you can start the software CompactConnect/ Compact Plus Connect.

Only required for software CompactConnect:

To make sure that an available device can be found you should activate at first the function **Scan non-USB devices** in the menu point **Preferences/ Options**:

Options		×
Ask for saving	evices ce o toggle LASER ge if LASER ON o toggle Video	Decimal separator ● System ○ User defined: Application title ● Application name ○ User defined: CompactConnect 1.10.5 Temperature unit ● ℃ ○ ♀ System priority Priority : Normal ✓
	Cancel	ОК
	count reached	
O Stop Memory: Recording inte resolution):	● erval (equal with d	Overwrite 45,8MB liagram 1msec
Recording time Communicat O Auto (r O Realtim	ion mode ecommended)	16 min, 40 sec
	ОК	Cancel

# Further you should set the **Communication mode** to **Standard** (Menu: **Measurement/ Settings**). This activates the so-called polling mode (bi-directional communication).

#### 5. Reset of the Adapter

The Ethernet adapter can be reset to the **factory default** configuration. Please use a ballpen to reach the reset button (hole on top of the housing):

- Power on the device while holding the Reset button down.
- After a few seconds you may see a blink of the green LED (network connection).
- Wait until you see the green LED blink a 1-5-1 pattern <sup>1</sup>), then release the reset button.
- Wait for the device to boot up. At this time, the configuration is returned to factory defaults.
- Powering off the device before releasing the button guarantees the configuration will NOT be reverted.
- Powering off the device just after releasing the button will result in an unknown configuration, possibly having some or all settings reverted to defaults.

<sup>1)</sup> blink – pause – 5xblink – pause – blink

After the reset the adapter works in the DHCP mode. If you like to establish a direct connection to a PC please follow this instruction, chapter 3.

#### **Communication via Raw TCP/IP**

The optional Ethernet interface for CT (ratio) devices is primarily promoted to implement a virtual COM port with a Windows PC. Alternatively, this interface can also be used for communication via "Raw TCP/IP" on any computer platform.

The Ethernet-Interface is shipped preconfigured for the usage with a Virtual COM port, but can easily be reconfigured for a "Raw TCP/IP" protocol.

- 1. In order to communicate via Raw TCP/IP, the CT with the Ethernet-Interface needs to be powered and connected to a network with an DHCP server. As an alternative to the DHCP server, a fixed IP address can also be assigned.
- 2. Find the IP-address of the Ethernet-Interface. The "Digi Device Discovery Utility" from the Digi website (<u>www.digi.com</u>) can be used for that purpose.



3. Enter this IP-address into the address line of your Internet browser. The Home Page of the Ethernet-Interface should be shown.

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	CT Ethernet Adapter Config	uration and Manage	ment
Home Configuration	Home		
Serial Ports	Getting Started Tutorial Not sure what to do next? This Tuto	rial can help.	
	System Summary		
Alarms System			
	Model: CT Ethernet Adapter IP Address: 192.168.0.103 MAC Address: 00:40:9D:C1:97:93		

4. Select "Serial Ports"

CT Ethernet Adapt	er Configuratio	× +						
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	5	CT Ethe	ernet A	dapter C	onfiguration a	and Ma	nage	ement
Home		Serial Po	ort Confi	iguration				
Configuration		Port D	escription	Profile	Serial Configuration			
Serial Ports	- (	Port 1	lone	TCP Sockets	9600 8N1			
GPIO		~						
Alarms								
System								

5. Select "Port 1"

	CT Ethomat Adaptes Cardiounstics and Management
	CT Ethernet Adapter Configuration and Management
Home	
Configuration Network	Serial Port Configuration
Serial Ports	▼ Port Profile Settings
GPIO Alarms	Current Port Profile: RealPort Change Profile The RealPort Profile allows you to map a COM and port to the serial port.

#### 6. Select "Change Profile"

	CT Ethernet Adapter Configuration and Management
Home	Select Port Profile
Configuration	Profiles allow you to easily configure serial ports by only displaying those items that are relevant to the current profile.
Network Serial Ports	
GPIO	Select the profile below that best matches your configuration.
Alarms	O RealPort
System Remote Management Users	The RealPort Profile allows you to map a COM or TTY port to the serial port. More
	O Console Management
Management Serial Ports Connections	The Console Management Profile allows you to access a device's console port over a network connection. More
Administration File Management Backup/Restore	TCP Sockets     The TCP Sockets     TCP Sockets     TCP     TCP Sockets     TCP     TCP Sockets     TCP     TCP
Update Firmware	O UDP Sockets
Factory Default Settings System Information	The UDP Sockets Profile allows a serial device to communicate using UDP. More
Reboot	O Serial Bridge
ogout	The Serial Bridge Profile configures one side of a serial bridge. A bridge connects two serial devices over the network
	O Local Configuration
	The Local Configuration Profile allows you to connect standard terminals or terminal emulation programs to the serial
	O Modem Emulation
	The Modem Emulation Profile allows you to configure the serial port to act as a modem. More
	O Custom
	The Custom Profile is an advanced option to allow full configuration of the serial port. More
	$\frown$
	Apply Cancel

7. Check "**TCP Sockets**", click "**Apply**", then the following screen should be shown:

	CT Ethernet Adapter Configuration and Management
Home	Serial Port Configuration
Configuration Network	▼ Port Profile Settings
Serial Ports GPIO	Current Port Profile: TCP Sockets Change Profile The TCP Sockets Profile allows a serial device to communicate over a TCP network.
Alarms System	TCP Server Settings
Remote Management Users	Connect directly to the serial device using the following TCP ports on the network.
Management Serial Ports	Enable Telnet access using TCP Port: 2001     Enable TCP Keep-Alive
Connections	Enable Raw TCP access using TCP Port: 2101 Enable TCP Keep-Alive
Administration	Enable Secure Socket access using TCP Port: 2601 Enable TCP Keep-Alive

- 8. Make sure that "Enable Raw TCP access using TCP Port:" is checked, note the port number "2101".
- 9. Scroll down to "Basic Serial Settings" and click on that triangle.



10. A Serial Port Configuration page should be shown.

	CT Ethernet Adapter Configuration and Management								
Home	Serial Port Configuration								
Configuration Network	Port Profile Settings								
Serial Ports	▼ Basic Serial Settings								
GPIO Alarms System	Description:								
Remote Management Users	Baud Rate: 9600 V								
Management Serial Ports	Data Bits: 8 ~ Parity: None ~								

- 11. Make sure that the selected baud rate is the same that has been set for the CT (Ratio) instrument, click the **apply** button.
- 12. Now every TCP/IP client program can be used to connect to the IP address of the Ethernet-Interface with the port number "2101". The communication commands for the CT (Ratio) instrument can be used, i.e. the binary command "0x01" to query the primary temperature value. The network monitor program "Wireshark" shows the data on the network (just a single byte "0x01" as the payload, sent from the host with the IP-address 192.168.0.100 to the instruments with the IP-address 192.168.0.103).

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	95 126.907323	192.168.0.1	239.255.255.250	SSDP	372 N	NOTIFY * HTTP/1.1				
	96 127.008350	192.168.0.1	239.255.255.250	SSDP	319 N	NOTIFY * HTTP/1.1				
	97 127.109150	192.168.0.1	239.255.255.250	SSDP	374 N	NOTIFY * HTTP/1.1				
	98 127.210366	192.168.0.1	239.255.255.250	SSDP	384 N	NOTIFY * HTTP/1.1				
	99 131.122115	00:e1:02:00:2a:24	Broadcast	ARP	42 W	who has 192.168.0.103? Tell 192.168.0.100				
	100 131.123332	OST oar_c1:97:93	CT D 1: a:24	ARP	64 1	192.168.0.103 is at 00:40:9d:c1:97:93 [ETH				
	101 131.123378	68.0.100	CT-Ratio	TCP	66 6	52870 → 2101 [SYN] Seq=0 Win=64240 Len=0 M				
	102 131.126269	102 102 9 103	192 162 0 100	TCP	62 2	2101 → 62870 [SYN, ACK] Seq=0 Ack=1 Win=81				
	103 131.126334	192.168.0.100	192.168.0.103	TCP	54 6	62870 → 2101 [ACK] Seq=1 Ack=1 Win=131328				
	104 134.147548	192.100.0.100	192.100.0.103	TCP	55 6	52870 → 2101 [PSH, ACK] Seq=1 Ack=1 Win=13				
	105 134.160104	192.168.0.103	192.168.0.100	TCP	60 2	2101 → 62870 [PSH, ACK] Seq=1 Ack=2 Win=81				
	51 0-010 (0)									
>	Flags: 0x018 (PS Window size valu									
		dow size: 131328]								
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	Urgent pointer:	•	.)							
>	[SEQ/ACK analysi									
0000		93 00 e1 02 00 2a 24	08 00 15 00 0	*\$.	F					
0000	00 40 90 C1 97 00 29 a9 bd 40									
0020		35 05 26 48 c6 30 45		e& H.0E.						
0030	02 01 82 37 00	(p 01	7							
Pavload										
		= Tuylouu								

The CT (Ratio) instrument with the IP-address 192.168.0.103 will answer to host with the IP-address 192.168.0.100 will with 2 bytes 0x09c0 (MSB first), that indicate the temperature. To calculate the temperature in °C subtract 1000 from that value and divide this number by 10 (0x9c0=2496 decimal, (2496–1000)/10=149.6 °C).

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File	Edit	View (	io C	Capture	Analy	ze St	tatistic	s Tel	ephony	Wi	reless	Tools	Help				
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Apply a display filter <ctrl-></ctrl->																	
No.		Time		Source				Destir	ation			Protoco	l Ler	igth	Info		
	95	126.9073	23	192.16	58.0.	1		239.	255.25	5.25	9	SSDP		372	NOTIFY * HT	TP/1.	1
	96	127.0083	50	192.16	58.0.	1		239.	255.25	5.25	0	SSDP		319	NOTIFY * HT	TP/1.	1
	97	97 127.109150 192.168.0.1				239.	239.255.255.250			SSDP		374	NOTIFY * HT	TP/1.	1		
	98 127.210366 192.168.0.1					239.	239.255.255.250					384	NOTIFY * HT	TP/1.	1		
	99 131.122115 00:e1:02:00:2a:24					Broa	dcast			ARP		42	Who has 192	.168.	0.103		
	100 131.123332 Digiboar_c1:97:93			00:e	00:e1:02:00:2a:24			ARP		64	192.168.0.1	03 is	at 0				
	101	131.1233	78	192.16	58.0.	100		192.	168.0.	103		TCP		66	62870 → 210	1 [SY	'N] Se
	102	131.1262	69	CT-R	otic	) <sup>3</sup>		100	162 0.	100		TCP		62	2101 → 6287	0 [SY	'n, ac
	103	131.1263	34	CI-R	auc	0		1H(	ost ø.	103		TCP		54	62870 → 210	1 [AC	K] Se
-	104	134.1475	48	192 14	0 0	100		192.	168.0.	103		TCP		55	62870 → 210	1 [PS	н, ас
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Temperature as Payload																	

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Please refer to the serial command list for command syntax and data format. The corresponding command list (CT-CTlaser-CTvideo-commands-xxxx-xx or CTratio-commands-xxxx-xx) can be found in the installation folder of the software under *Commands*.