

## Network and Distributed Data Acquisition Using Dewesoft NET

# **DEWE**Soft<sup>®</sup> **NET**



#### What is Dewesoft NET?

<u>Dewesoft NET</u> application module provides a nice way to acquire data over the network. This allows us to use multiple systems as one instrument or to acquire data from different locations.

<u>Dewesoft NET</u> application module allows one or more measurement units to be under the control of other computers, named clients. The measurement units and clients must be connected via TCP/IP.

It is important to note that while any channel can be viewed on the clients, the actual data is stored on the measurement units.

Working with <u>Dewesoft-NET</u> is comprised of three basic steps:

- NET setup network configurations, appropriate hardware and <u>Dewesoft-NET</u> setup (setting up client and measuring unit, remotely controlling a slave measurement unit)
- Measurement creating a display, measuring and acquiring data, and storing this data on a network.
- Analysis analyze acquired and stored data on the network, export measured data.



Image 1: Setup the equipment, connect over the Dewesoft NET and start measuring

#### Which are the Modes of Operation?

Dewesoft NET offers three modes of operation:

Mode	Number of Measurement Units	Number of Clients
1:1	1	1
X:1	multiple	1
1:X	1	multiple

With these three modes, almost any application can be covered - from single-channel expansion over the remote control to distributed measurements over hundreds of kilometers - everything is possible.

#### 1:1 Mode - Single measurement unit and a Single client



Image 2: 1:1 operation mode for Dewesoft NET

1:1 mode works with a single measurement system and a single client. In this mode, there are two types of operation:

Types of operation	Description
Full remote control	The client computer acts like a master of the measurement system. When controlling client changes to the setup screen, the measurement system also changes the setup screen.
View only	The measurement system acquires data, while the client computer can connect to it and view the "live" data, but it cannot control the measuring system. A "view client" can only look, but not 'touch'.

## X:1 Mode - Multiple measurement units and a Single client



Image 3: X:1 operation mode for Dewesoft NET

Multiple measurement systems and a single client are used in the case of distributed measurements or too high acquisition rates to be managed by a single measurement unit.

The measurement systems have to be synchronized either with hardware clock (one unit is the clock master, the others are slaves) or with the external clock source that is either IRIG or GPS. All measurement systems have to run with the same acquisition rate, in this case, only one connection option is possible - the client is always the master.

Master client starts and stops the measurement on all units in the measurement network. At any time, the client has access to view mode - but only to one measurement system (one-to-one connection like in single measurement system & single client configuration). Additional view devices are possible, but they can access only a single measurement system.

### 1:X Mode - Single measurement unit and Multiple clients

#### SINGLE MEASUREMENT UNIT

X - CLIENTS



Image 4: 1:X operation mode for Dewesoft NET

The third network configuration is to have a single measurement system controlled by one 'master' client and additional 'view' clients.

The master client is able to change the measurement system setup, storing strategy, start and stop measurements, and much more. The view clients are only allowed to take a few channels from the measurement unit (up to the bandwidth limitation) and view and store the data on their local hard disk.

#### Which Connection Types can be used?

The NET system is always connected via ethernet protocol. This can be obtained in several different ways:

Ethernet protocol connection Type	Description / Specialty
Point to point connection	It is the easiest and most simple configuration of the NET system. On <i>either</i> side, you have a computer ( <u>S-box</u> , <u>Minitaur</u> , PC, laptop,) with a measurement device ( <u>DEWE-43</u> , <u>Sirius</u> ,) or without it. With point to point connection, you have an <i>ethernet</i> cable between those two devices. You have to manually set the IP addresses on both sides.
Router	
Local network LAN	The only limitation is the connection speed.
Internet - Wired	Dediested TDC/ID nexts need to be energed
Internet - Wireless	Dedicated TPC/IP ports need to be opened.

[Video available in the online version]

#### Point to Point Connection: IP Address adjustment

With the point to point connection, we connect two devices with the ethernet cable. We just have to manually set the IP addresses on both sides.

In order to do that, we have to go to Control panel -> Network and Internet -> Network and sharing center.



Image 5: Open Control Panel and select Network and Internet

We need to select Change adapter settings.

🚆 Network and Sharing Center				- 🗆 X
← → ▾  🖺 > Control Pa	anel > Network and Internet > Network and Sharing Cente	r	5 V	
Control Panel Home Change adapter settings Change advanced sharing settings Media streaming options	View your basic network information and s View your active networks Dewesoft Private network Change your networking settings Set up a new connection or network Set up a broadband, dial-up, or VPN connection Troubleshoot problems Diagnose and repair network problems, or get	et up connections Access type: Internet Connections: File Ethernet on; or set up a router or access point. troubleshooting information.		
See also Internet Options Vector Hardware Windows Defender Firewall				

Image 6: Select Change adapter settings

Right-click on Local connections and select the Properties.



Image 7: Right-click on Ethernet local connection and select the Properties

In Properties, we choose Internet Protocol Version 4 (TCP/IPv4) and type in the IP address.



Image 8: Select the Internet Protocol Version 4 (TCP/IPv4) and click on the Properties button

IP addresses on devices must be the same, except for the last number, which must be different (ex. IP address on the first device 192.168.10.1, and the IP address on the second device is 192.168.10.2).

General	
You can get IP settings assigned auton this capability. Otherwise, you need to for the appropriate IP settings.	natically if your network supports ask your network administrator
Obtain an IP address automatical	у
• Use the following IP address:	
IP address:	192.168.10.2
Subnet mask:	255 . 255 . 255 . 0
Default gateway:	
Obtain DNS server address autom	natically
• Use the following DNS server add	resses:
Preferred DNS server:	
Alternate DNS server:	

Image 9: Type in IP address

Now we can connect with the device in Dewesoft X software, measure, and collect data from it.

#### How to Configure and Connect a Measurement Unit?

There are several possible configurations and setups:

Unit Configuration options	Description
Standalone Unit	Not networked to anything (the default setting of <u>Dewesoft X</u> upon installation).
Slave Measuring Unit	Can measure data under either local control or under the control of a master client.
Master Measuring Unit	Can both measure data and control other measurement units (optional).
View Client	Can view data being recorded on the measurement units, but cannot control them.
Master Client	Can control the measurement unit(s) and view their data.

Each measurement unit must be configured as a slave measuring unit in order to utilize the <u>Dewesoft NET</u> software, however, if you are going to use one of your measurement units as the controller for the others, then you should configure that one unit as a master measuring unit.

It is not possible to have more than one "master" within a single <u>Dewesoft NET</u> system, in order to avoid confusion and conflicts.

#### Searching for the Measurement unit

To activate the appropriate mode for each system within the <u>Dewesoft NET</u>, first *run* the <u>Dewesoft X</u> and open the *Settings menu*.



Image 10: Open Dewesoft X software and go in Settings

Operation mode must be set to Real measurement. To add new devices click the plus button, and then add a new device. Under Dewesoft NET select a manually add measurement unit, and add it as a device.



Image 11: Set the Real measurement operation mode, click on the plus button, and add a Dewesoft NET Measurement unit

Now you will see all available measurement units (names, MAC addresses, ...).

Dewesoft Launcher must run on measurement devices so that they can be seen as available units.

Available measurement units				Х
Measurement unit name	MAC address	for "Wake Up On LAN" (xx:xx:	xx:xx:xx:xx)	
NUC-20160015	DC:53:60:C	E:F0:90		
RunExe version 7.3	IP address	10.2.121.52; subnet: 255.25	5.0.0	
Measurement unit				^
SW-TV-NUC2				
NUC-20150177				
SHR-SEJNA-S				
WORKS-20190348				
NUC-20160015				
NUC-20190065				
WORKS-20130002				$\mathbf{v}$
		OK	Cancel	

Image 12: Now you can see all the available measurement units



Image 13: You can also type in the other system's IP address in the 'Measurement unit name' and connect to it

### Principle of Dewesoft NET application Module

It is important to note that *by default* **actual data is stored on the measurement units**, even though it can be viewed from the clients. This is critical to protect yourself against data loss which might occur by the network going down or transmission being interrupted. Even if this happens, the *data is safely stored on the measurement units*. When the network connection is reestablished, it is possible to reconnect automatically.

Even if the network going down or transmission was being interrupted, the data is safely stored on the measurement units. The idea of <u>Dewesoft NET</u> technology is to have a **distributed system** when:

- the required computing power is too high for a single measurement unit (many channels sampled with a high sample rate),
- there is too much distance between the units for analog data transfer,
- the measurement unit is not accessible (dangerous measurements, test rig measurements, ...),
- data from measurement units shall be displayed on several client computers,
- measurements have to be remotely controlled or supervised.



#### ETHERNET DATA TRANSFER

Image 14: Principle of the Dewesoft NET data transfer

Within <u>Dewesoft NET</u> the master client completely controls the slave measurement unit - when the master unit switches to the setup screen, also the slave unit switches to the setup screen.

It is often not possible to transfer all possible channels in real-time to the client for storage, even using a gigabit Ethernet interface.

Imagine even one Dewesoft system with 32 channels, being sampled at 200 kB/s each at 24-bit mode. This is already 25.6 MB/sec, which is more than 200 Mb per second (where each Byte = 8 bits). It does not take long for the network to be completely overloaded with data and be overwhelmed with packet loss.

**Immediately after the acquisition is stopped,** a button appears on the controlling client **allowing the** data file(s) to be uploaded from the measurement units for viewing on the client computer.

#### How to set up a Master Client?

In the case where your Dewesoft systems are all slave measurement units, you need one master client to control them. Let's assume that we are now sitting at this computer and have <u>Dewesoft X</u> properly installed and ready. Open the *Settings* menu.

Now use the selector to assign this computer to be the Master client, as shown below:

Search Q	DEVICES			
Devices	Operation mode	Real mea	asurement	~
Extensions	⊕	⊗ Synchronization		
Global variables	Local system	Time source	PC Clock	~
Data header	192. 168. 10.2	PC Clock Clock provider	Standalone	$\checkmark$
U Startup		⊗ Settings		
Performance		Channel setup sample rate	20000	s/s/ch
User interface		Enable DSI adapters, TEDS sensors		Ø
Files and folders		⊗ Dewesoft NET		
E Storing		Remote mode	Master client	$\sim$
Reports		Auto connect		Ø
Security		Auto connect to measurement units on star Store data on slave clients	rt and exit of settings	Ø
( Update		Store data on remote measurement unit	s	Ø
X Advanced		Disable mouse and keyboard on measure	ement units	Ø
		1		OK Cancel

Image 15: Set one system as a Master client, which will control the other systems

After confirming the <u>Dewesoft NET</u> setup, the following window will appear:



Image 16: As you exit the Settings with OK, this window will appear where you can connect to the slave measurement unit

Select the Connect button to *connect with the measurement unit*. After successfully connecting, the measurement unit will be seen as it is shown on the image 16.

You can also change the Channel prefix, and instead of the [Host name] which would in our case be 192.168.10.2, choose for example MU, which stands for a Measuring Unit.

		Q	Dewe	soft X3 S	P12								[	-		] –	
	Measure	Analy	vse Setup	o files Ch	. setup M	leasure										윤 NET	Options
Stor	e Save	F Save as	Storing		M Analog in	<mark>+ ÷</mark> πΣ Math	Hore	Remove									
192.	168.10.2														Channel lis	st	~ 🗙
Chan	nel prefix MU	]			Storina tvp	e data not s	tored on me	asurementu	unit								
Samp	erate 20	000	~	Hz	View type	Tree view	1	~									
+	Transferred	Color		Name			1	Description		Sample rate	Transfer rate		Values		Zero		
4			Cha	annels/Local													
<b>_</b> ▲				AI													
	Transfer			MU:AI 1		SIRIUS-HS	-CHG (Volta	ge; 10 V; D0	C;) SN: DF0000047C	20000	full	-10.000	0.000	10.000	Zero		
•	Transfer			MU:AI 2		SIRIUS-HS	-CHG (Volta	ge; 10 V; D0	C;) SN: DF0000047D	20000	full	-10.000	0.000	10.000	Zero		
	Transfer			MU:AI 3		SIRIUS-HS	-CHG (Volta	ge; 10 V; D0	C;) SN: DF0000047B	20000	full	-10.000	-0.001	10.000	Zero		
	Transfer			MU:AI 4		SIRIUS-HS	-CHG (Volta	ge; 10 V; D0	C;) SN: D0132BF1AA	20000	full	-10.000	0.000	10.000	Zero		
•	Transfer			MU:AI 5		SIRIUS-HS	-CHG (Volta	ge; 10 V; D0	C;) SN: D0132BF1AC	20000	full	-10.000	0.000	10.000	Zero		
	Transfer			MU:AI 6		SIRIUS-HS	-CHG (Volta	ge; 10 V; D0	C;) SN: D0132BF1AB	20000	full	-10.000	0.000	10.000	Zero		
	Transfer			MU:AI 7		SIRIUS-HS-ST	rG+ (Voltag	e; 50 V; DC;	Exc 0 V;) SN: DF00	20000	full	-50.00	0.00	50.00	Zero		
	Transfer			MU:AI 8		SIRIUS-HS-ST	FG + (Voltag	e; 50 V; DC;	Exc 0 V;) SN: DF00	20000	full	-50.00	0.00	50.00	Zero		
4			E	VENT LOG													
	Transfer		MU:	Data events	5					10	full		not available		Zero		
4			Inputs/Local3/	/1000004/15	147925245												
	Transfer		P	PolygonVC									0				

Image 17: After connecting with the measurement unit you will be able to see it under NET tab in a Channel setup

Note that the slave measurement unit called 192.168.10.2 was already found in our example. But if you have not already configured and connected to a measurement unit, just click the Add button and select one or more measurement units in order to add them to the system.

Now click OK to close this dialog and you will notice that the basic <u>Dewesoft X</u> screen has a new addition to the top bar a NET icon:

		Q	Dewe	softX 202	4.5				Information	Devices	NET	٥	_	۵	×
	Measure	Analyze	Setup	o files Ch	. setup Me	easure								=	Options
O Store	Save	Save as	Storing	NET	M Analog in	+÷ πΣ Math	Hore	Remove							



Click on the NET icon to show the connection screen. Clicking the Measure bandwidth button in the system will check network performance. In a 100 Mbit network, the transfer speed is about 10 MB/second while Gigabit LAN offers speeds close to 100 MB/second. Please note that the real bandwidth is also limited by system performance.

NET				
Configuration	Measurement unit	Remote setup	Status	
1	192.168.10.2  115344kB/s	Show remote desktop	Mode: Measure; Clock mode: Standalo	
	_			
Measure bandwid	th		Reconnect Clos	e

Image 19: Click on the NET icon to preview the connection screen, where you can also measure the bandwidth

[Video available in the online version]

#### How to set up up a Slave Client?

If you want your unit to be set as a slave client, you must first enable remote connections.

Search Q	DEVICES			
Devices	Operation mode	Real mea	asurement	~
Extensions		⊗ SBOX system		
Global variables	SBOX System (Local )	⊗ Synchronization		
Data header		Time source	Dewesoft DAQ Devices	~
( <sup>I</sup> ) Startup		Clock provider	Standalone	~ 📀
Performance		⊗ Settings		
User interface		Channel setup sample rate	20000	s/s/ch
Files and folders		Enable DSI adapters, TEDS sensors		$\odot$
Storing		⊘ Dewesoft NET		
Reports		Allow remote connections to this system	1	Ø
Security		Store data on slave clients		<b>Ø</b>
Update				
X Advanced				
🔎 Licensing				
				OK Cancel

Image 20: Enable 'Allow remote connection to this system' on a measurement unit side to set up a slave client

In the example below, the system sees many measurement units on the network, called MU1, MU2, MU3, etc.

NET							
Configuration	Measurement unit	Remote setup	Status	^			
	MU1	Show remote desktop	Connected (X3 SP12 (RELEASE-2006 (64-bit))	503)			
	MU2	Show remote desktop	Connected (X3 SP12 (RELEASE-2006 (64-bit))	503)			
	MU3	Show remote desktop	Connected (X3 SP12 (RELEASE-200603) (64-bit))				
MU4		Show remote desktop	Connected (X3 SP12 (RELEASE-200603) (64-bit))				
	MUS	Show	Connected (X3 SP12 (RELEASE-2006 (64-bit))	503)			
			Connect	Cancel			

Image 21: Many measurement units coupled together

Further setup can be done in Master Client Settings:

- Store data on remote measurement units (checked by default, and highly recommended!)
- Store data on slave clients
- Disable mouse and keyboard on measurement units:
  - If you want to prevent a local operator from changing any settings on the measurement unit or interfering with the test. With this checked, the measurement unit cannot be operated locally, you will have complete control over the client.



Image 22: Further settings that can be made on a Master Client's side

[Video available in the online version]

#### How to Setup the Measurement and start Measuring?

In this section you will learn the procedures to control the acquisition from the client:

- creating a display on the client
- storing data on the measurement unit
- transfer stored data to the client
- NET menu option

#### Creating a display on client

Before you begin storing, you may want to set up the **local display.** In previous steps, you may have configured the display of one or more measurement units, but you probably want to see data here, too!

You certainly know how to do this. Go to the Measure mode on the Master client and at the top of your own screen, you have the add Widget button here on the Client to create displays with any combination of channels from any and all measurement units.

As mentioned previously, all measurement units must have a SYNC method in place in order to ensure these three things:

- truly synchronized data files from multiple measurement units
- ability to display channels from more than one measurement unit on the client
- ability to create math channels on the client with channels from more than one measurement unit

Note that the CHANNELS list is now showing channels with the "name" of the **MU** that they come from automatically. This is so that you know the source of every channel in an easy and convenient way.

		Q	Dew	esoft X3	SP12						品 NET	E Dis	k left: 381.6	GB 🗘 a=	50hz d=50hz	- CPU: 3	20 %	□ ×
	Measure	Analyse	e Seti	up files (	Ch. setup	Measure	Amplifier										🕑 Edit 🛛 🖧 NET	Options
O Store	Pause	Stop	* Freeze	<b>D</b> esign	Widgets	Displays	Recorder	> Custom										
									Recor	der							🔛 📋 📐	Ø
O Digita	Imeter	^	000:0														Search	۹
Controls	4 🔾 🕀	Ø	10														▼ Local	
Columns	* O O		8														▼ 🗐 Math	
Transnare	ancy OFF	0	9														► I Evention	
Unified	incy on	0															▼ 🗐 192.168.10.2	Local
properties	5	8	<u>-</u> e														▼ ( AI	
⊗ Value	5 Channel		D W														い MU:AI 1 い MU:AI 2 い MU:AI 3	
value typ	e channei		9:9														₩ MU:AI 4	
type	Actual	~	8														M MU:AI 5	
Update	Fast (0, 1	s v	10.00														M MU:AI 6	
rate			02:23	3.1 02:24	1.0		02:26.0		02:2	8.0		02:30.0			02:32.0	02:33.1	10, MU:AL8	
⊙ Colori	na		MU:AI 3; -			AGT	MU:AI 1; - (V)		ACT	(s) MU:AI 5; - (			ACT 🚶	U:AI7; - (V)		A	► C EVENT LOG	
Normal color				-(	).0(	01		0.	000		0	.000	)		0.	00		
Use upper	r limit	0																
Limit	0	V																
Color																		
Use lower	limit	0																
Limit	0	V																
Color																		
⊙ Drawi	ng options	~	-50.00	-40.00	D	-30.00	-20.00	-10.0	00 00 B IA:UM	.00 ; - (V)	10.00	20.0	0	30.00	40.00	50.0	0 WE	

Image 23: MU channels are defined for the Measurement Unit, which is in our case the 192.186.10.2 system

In our example, the name of the MU is added in front of the transfer channels.

The channels from each measurement unit will be shown this way *automatically*. This is the only thing that differs from setting up a screen in the standalone mode of <u>Dewesoft X</u>.

#### Storing data on the measurement unit

With the *client* and the *measurement unit* properly configured, we can now store data. Just click Store in the toolbar in the normal way.



Image 24: Start storing

#### Transfer stored data to the client

As soon as the storing is stopped, an important button appears automatically, called Transfer button:



Image 25: In case you are storing data on the measuring unit, you will be able to see the Transfer button as you will stop storing the measurement

Please click it, and the data file(s) from all measurement units that we just used will be downloaded to the client for you. A "transfer box" appears to show the progress and eventual completion of the download:

Download files from me	×	
Measurement unit	Status	
192.168.10.2	Download complete (3013.5 kB)	
	Close	

Image 26: Data is now downloaded to the Master client

In this case, we only had one measurement unit, so only one file needed to be downloaded.

#### NET Menu Options

Click the NET menu option to see the list of options:

NET		
Main MU		
Measured bandwidth: N/A 🗘 Required bandwidth: 159,57 kB/s		Local Action
Measurement Units		
Disconnect Action (1/1)		
Used Remote action > th	Status	Remote setup
Used 192 System operation > Close Dewesoft Reboot	Standby	Setup
Shutdown Wakeup		
Fix network problems	Local mode	Close

Image 27: NET options

NET options	Description
Connect/Disconnect from a measurement units	Connect to all measurement units/releases the connection
Close <u>Dewesoft X</u> on measurement units	Closes the <u>Dewesoft X</u> application on all measurement units
Measure bandwidth	Measuring the bandwidth (transfer speed) between the measurement units and this client
Show status	Displays current status of all measurement units
Reboot measurement units	Reboots the measurement unit computers (useful if they have crashed or hung up)
Shut down measurement units	Shuts down the measurement units (requires ACPI power system on the measurement units)
Wake up measurement units	Starts measurement units (requires 'Wake-up on LAN' option enabled on the measurement units)

#### How to Analyze the Transferred data?

Once the captured data files are downloaded to the client, you can replay them there.

Click the Analyse button and *locate any transferred files* that you have. Notice that we also put the name of the measurement unit into the filename by default, so that you can see that this file came from a measurement unit called MU.

The filename was set to *Test*. So the name shown here is **Test**.192.168.10.2.

		Dewes	oft													[			] - [	
	easure Analys	Data fi	es Setu	n Review												L				
			.+						_			~~ <u>~</u>							00	
L +	Le l	] 9		-4-	AVI				Abc_			L_								
Import Mul	ltifile export Apply a	action Use for i	measure R	evert to orig	AVI compress	Post-sync.	video	Load F	Rename	Delete	Сору	Cut	Paste	2						
Folders		× 🖴	Search		Q															8
🔄 Data			+		File name			S	ize	Start s	tore time	Vers	sion	Sample rate	e		Channels		Store	mode ^
			<ul> <li>Test.d</li> </ul>	xd					3.5 MB	09-Jul-20	13:12:20	X3 SP12 (	RELE	20000 Hz	Rer	mote: 9, Ma	th: 1, Event	log: 1	always fast	
			<ul> <li>Test.1</li> </ul>	92.168.10.2.	dxd				2.9 MB	09-Jul-20	13:10:10	X3 SP12 (	RELE	20000 Hz	AI:	8, Event lo	g: 1		always fast	
			<ul> <li>T0034</li> </ul>	_A_0262_000	4.dxd				3.9 MB	06-Jul-20	15:05:38	X3 SP12 (	RELE	500 Hz	AI:	: 7, CAN: 27	7, Plugins: 1,	Math: 2	always fast	:
			<ul> <li>T0034</li> </ul>	_A_0262_000	3.dxd				1.3 MB	01-Jul-20	10:56:38	X3 SP12 (	RELE	500 Hz	CA	N: 12, Math	1: 3		always fast	
			<ul> <li>T0034</li> </ul>	_A_0262_000	2.dxd				3.3 MB	01-Jul-20	10:39:42	X3 SP12 (	RELE	500 Hz	CA	N: 27, Math	1:2		always fast	1
			<ul> <li>10034</li> </ul>	_A_0262_000	1.dxd				4.1 MB	01-Jul-20	10:34:40	X3 SP12 (	RELE	500 Hz	AI:	: 7, CAN: 27	, Math: 2		always fast	-
			<ul> <li>10034</li> <li>OPDT</li> </ul>	_A_0262_000	u.axa				4.0 MB	01-Jul-20	10:33:46	X3 SP12 (	RELE	500 HZ	AI:	: 7, CAN: 28	s, Math: 2		always fast	
			• 0601	_malej.uxu	lvd				620 kB	03-Jun-20	14:30:53	X3 SP11 (	DELE	20000 Hz	AT-	igins: 5 • 1			always fast	
			<ul> <li>Test11</li> </ul>	Ldvd	ixu				90.1 MB	18-May-20	11:47:50	X3 SP11 (	RELE	100000 Hz	AT:	1. AO: 1			always fast	
			• CEA d	lata.dxd				2	19.4 MB	12-May-20	18:54:10	X3 SP12 (	RELE	100000 Hz	AI:	: 9. Math: 26	68		always fast	
			<ul> <li>Test11</li> </ul>	1.dxd				_	67.9 MB	12-Mav-20	18:44:32	X3 SP11 (	RELE	100000 Hz	AI:	: 9. Math: 26	68		alwavs fast	×
			<																	>
Settings Eve	ents Data heade	r File locking	Preview	/																
General file info																				
Sample rate		:	Store date a	and time		N	umber of d	hannels												
20000 s/sec			09-Jul-20	13:10:10		9														
0.05 sec			Ouration			ir al	igger cond ways fas	itions t												
Search		0																		
bearen		~																		
+	Ch. no			Name	C	olor Ra	te		Ch	annel info			Senso	or U	Init	Scale	Offset	Min	Max	^
•	AI 3			AI 3		200	000 SI	RIUS-HS-CH	IG (Voltag	e; 10 V; DC	;) SN: DF000	00478			V	1.00	0.00	0.00	0.00	
	AI 4			AI 4		200	000 SIF	RIUS-HS-CH	G (Voltag	e; 10 V; DC	;) SN: D0132	BF1AA			V	1.00	0.00	0.00	0.00	
0	AI 5			AI 5		200	000 SIF	RIUS-HS-CH	G (Voltag	e; 10 V; DC	;) SN: D0132	BF1AC			V	1.00	0.00	0.00	0.00	
	AI 6			AI 6		200	000 SIF	RIUS-HS-CH	IG (Voltag	e; 10 V; DC	;) SN: D0132	2BF1AB			V	1.00	0.00	0.00	0.00	
	AI 7			AI 7		200	000 SIR	IUS-HS-STG	6+ (Voltag	je; 50 V; DC	; Exc 0 V;) S	N: D			V	1.00	0.00	-0.01	0.01	
	AI 8			AI 8		200	000 SIR	IUS-HS-STG	6+ (Voltag	je; 50 V; DO	; Exc 0 V;) S	N: D			V	1.00	0.00	-0.01	0.00	
4	Event log																			
•	EventLog		D	ata events		0.	1								-	1.00	0.00	0.00	0.00	~

Image 28: Choose the transferred file, which is in this case named Test. 192.168.10.2

Double-click it to open and use the normal tools for analyzing, reviewing, printing, and more.

## Why is the NET Ethernet Protocol used for Data Transfer instead of the USB?

#### USB 2.0 Bandwidth Limitation

One reason why we use NET configurations is that **USB bandwidth is limited**. USB port has a lower bandwidth limitation than an ethernet port:

- 35 MB/s (in practice ~ 30 MB/s)
  Dewesoft USB limit notice at 26 MB/s
  USB 3.0 does not help upstream

#### General formulas for Calculation

AI and AO channels	$NumberOfChannels \cdot SampleRate \cdot 4 rac{\cdot Bytes}{Sample}$ (/2 is you use HighSpeed)
CNT channels	$NumberOfChannels \cdot SampleRate \cdot 8 rac{Bytes}{Sample}$
CAN channels	$NumberOfCAN ports \cdot rac{Baudrate}{8}$
Slave units (only for clock/trigger sync)	$SampleRate \cdot 8rac{Bytes}{Sample}$

It is very important how the USB port is internally wired in the computer - 30 MB/s per single root hub.

Dewesoft calculator is a simple tool that calculates USB transfer (MB/s) for various Dewesoft devices. You can download it here or by clicking on the picture below.

/ DEWESoft Calculator	- 🗆 X
Bandwidth Storage	
USB Bus Systems	EtherCAT Bus Systems
Select Type of System: Sirius	-Krypton Systems Specify Sample Rate and Number of Channels:
Specity Sample Nate and Number of Channels:	
Al 100 🗣 kHz 0 🗣 Channels	
AO 100 - kHz 0 - Channels	
CNT 100 - kHz 0 - Channels	- Sirius-E Systems
CAN 500 r kBaud 0 r Channels	Specify Sample Rate and Number of Channels:
Slave Units 100 💌 kHz 0 💽 Cik-trig slave units	Al 5 🚖 kHz 0 🖨 Channels 0 🖨 Units
	CNT 5 🚖 kHz 0 🚖 Channels 0 🚖 Units
Calculated Bandwidth: <sup>4</sup> 0.00 MB/s Required USB cables: <sup>2</sup> 0	Calculated Bandwidth: <sup>3</sup> <b>0.00 KB/s</b> Required cables: <b>0</b>
Note 1: Only for "Master / Slave" sync additional data is transfered, if "IRIG Mas	ter / IRIG Slave" sync is used, no additional data is transferred for Slave units.
Note 2: While USB 2.0 is specified for bandwidth up to 35 MB/s, it is recommend	led that speed on certain USB port doesn't exceed 29 MB/s!
Note 3: It is recommended that the EtherCAT bus bandwidth not exceed 6-10 MI	B/s!
Note 4: Bandwidth is just an estimate. When dealing with large channel counts a	and bandwidth, computer limitations may have an effect on performance.
Version: 1.5	A DEWESoft®
Image 29:	Dewesoft Calculator

#### NET transfer limitations

The limitations of NET transfer are dependent on:

- the speed of Ethernet link in case of large bandwidth
- the write speed of the hard drive in case of large data storage
- CPU performance in case of advanced math

We are limited with data transfer because all the PCs are connected together with 1Gb LAN cable.

The next table shows the *upper limits of transferred data* (in samples/second) per 1 PC. Each PC can store approximately 25.600.000 samples per second and that number of samples can be distributed randomly between measurement units.

With full this sample rate, PC stores approximately 100 MB/s of data:

Time	Data size
10s	1GB
1min 40s	10GB
16min 40s	100 GB
2h 46min 40s	1 TB

#### How to Synchronize the devices?

The basic idea of synchronization is to provide a clock signal from a time source. Clock slave receives the signal from the clock provider and the devices are synchronized.

Devices can be synchronized in two different ways:

- **Software synchronization** The software synchronization accuracy is around 2-10 ms, which is enough for a simple temperature measurement. This synchronization solution requires no additional hardware.
- Hardware synchronization This is a hardware solution that can synchronize all USB devices (<u>SIRIUS</u>, <u>DEWE-43</u>, ...) and EtherCAT devices (<u>KRYPTON</u>).

In the example below, we have connected one Sirius, one DEWE-43, and one Krypton measurement unit to the S-BOX.



together

### Time source

Time source	Dewesoft DAQ Devices 🔹						
Dewesoft DAQ Devices Clock provider   IRIG-B DC	External Dewesoft DAO Devices Dewesoft RS232 (Topcon/Javad/NVS) - COM1						
Dewesoft RS232 (Topcon/Javad/NVS) - COM1 No hardware sync	SoftSync 👻						

Image 31: Selecting the Time source	nage 31: Sele	ecting the	Time	source
-------------------------------------	---------------	------------	------	--------

Time source provides a clock for synchronization. It can be selected from:

- Dewesoft DAQ devices (when we have a Dewesoft measurement device connected to our computer),
- External (Clock/Trigger, IRIG-B DC, NTP, GPS PPS),
- PC clock (when we have only a computer, without a measurement device), or
- GPS devices (Dewesoft RS232 (Topcon/Javad/NVS), NMEA compatible GPS, ...).

Synchronization types are dependent and automatically adjusted from the DAQ devices connected to our system.

If Dewesoft DAQ device is selected as a time source, the clock provider must be selected from:

Dewesoft DAQ Devices	~
IRIG-B DC	~ ⊘
Standalone Clock/Trigger	
	Dewesoft DAQ Devices IRIG-B DC Standalone Clock/Trigger IRIG-B DC

Image 32: Select the Clock provider for Dewesoft DAQ Devices

Type of synchronization	Description
Automatic	This option automatically selects the best option for synchronization regarding the hardware connected to the system.
Standalone	Only one device, there is no synchronization between devices needed.
SoftSync	This synchronization solution requires no additional hardware. The accuracy is > 10 ms.
Clock/Trigger	A clock and a trigger signal are used. With each trigger signal, a sample is acquired.
IRIG-B DC	It contains time-of-year and year information in a BCD format (it contains the information about the absolute time). This is the best way to synchronize the devices because it is the most exact one.
GPS PPS	Since the satellites are transmitting exact absolute time and better receivers usually output this pulse with a high precision (below one microsecond), we can use this technology to synchronize remote systems - and there is no distance limit.

	Network Time Protoc computer systems. It	ol (NTP) is a networkin	ng protocol for clock synchron other methods.	ization between
	External Clock provider		NTP	~ Ø
		Image 33: Edit NT	P clock synchronization	
NTP	To enter the addresse you want to have mor must be entered in all When you check NTP address is wrong, the	es of the NTP server cli re devices synchronize l of them. NTP settings (TP servers goodtime.ijs.si umber of retries before switching Check NTP servers Image 34: Enter the a servers, the time and of check will fail. NTP settings (TP servers goodtime.ijs.si., 6.10.2015 14: 1 umber of retries before switching Check NTP servers goodtime.ijs.si., 6.10.2015 14: 1 Check NTP servers goodtime.ijs.si., 6.10.2015 14: 1 Check NTP servers goodtime.ijs.si., 6.10.2015 14: 1 Check NTP servers nage 35: As you check NT server w	ick the edit button near the dro d via NTP protocol, the same s of to next NTP server addresses of the NTP server date of the server will be displa (3:54) g to next NTP server P servers the time and date of the ill be displayed	ayed. If the server

#### Synchronization between Dewesoft USB devices

	Accuracy	When to use	Device
Clock/trigger	< 1 µs	stationary	Dewesoft, RoaDyn
IRIG-B DC	< 1 µs	stationary	Dewesoft, Meinberg
GPS PPS	< 1 µs	mobile	GPS receiver
NTP	< 10 ms	ethernet	NTP server
SoftSync	< 10 ms	when there is no external time source	/

Any Dewesoft device can be precisely synchronized by hardware (Sirius, Dewe-43, Minitaur, DS-CAN2).

#### Synchronization Connections

When using the NET system, there are several possibilities that can be used for synchronization:





### Synchronization with ECAT-SYNC-JUNCTION

<u>ECAT-SYNC-JUNCTION</u> works in the same way as other Dewesoft devices. It is automatically recognized within <u>Dewesoft X</u> software (supported from version X2 SP4). By default, <u>ECAT-SYNC-JUNCTION</u> will be set up to synchronize between <u>KRYPTON</u> EtherCAT® and <u>SIRIUS USB</u>.

With <u>ECAT-SYNC-JUNCTION</u> several connection options are possible:

 Synchronization of <u>SIRIUS/DEWE-43</u> USB with <u>KRYPTON/SIRIUSiwe</u> EtherCAT® devices, where the accuracy of synchronization is < microsecond</li>



Image 42: Synchronization of <u>SIRIUS/DEWE-43</u> USB with<u>KRYPTON/SIRIUSiwe</u> EtherCATĂ,® devices

• Synchronization of <u>KRYPTON</u> module with an external IRIG B DC triggering source



Image 43: Synchronization of <u>KRYPTON</u> module with an external IRIG B DC triggering source

• Synchronization of KRYPTON and SIRIUS USB with an external IRIG B DC triggering source



Image 44: Synchronization of <u>KRYPTON</u> and <u>SIRIUS USB</u> with an external IRIG B DC triggering source

• Synchronization of KRYPTON/SIRIUSiwe with triggered cameras



Synchronization of <u>SIRIUS/DEWE-43</u> USB with <u>KRYPTON/SIRIUSiwe</u> and triggered cameras



**NOTE** - Dewesoft EtherCAT® devices (<u>KRYPTON</u>) are already synchronized between each other by the daisy chain cable, therefore no additional cables are necessary between them.

## How to Remotely Control and setup the Channels of the Measurement Unit?

In this section, we are using only the *master client computer* to remotely configure and control a measurement unit from this master client. The measurement unit is already connected to it using the steps from the preceding section. All steps are done on the client.

We are not touching the measurement unit at all. It could be a few feet away, on the other side of the building, or miles away. As long as it has a reliable network connection to the client, we can control it from this client!

#### Local setup - NET

Now click the *Ch. setup* button -> *NET*. In this case, we have used 15 Measuring Units (MU). If you know what the <u>Dewesoft</u> <u>X</u> Setup screen normally looks like, you will notice a subtle but important difference - there is a tab for each measurement unit in which you can reach out for each measurement unit remotely - see the section <u>Remote Channel and Display setup</u> <u>on the measurement unit</u>.

	Q	Dewesoft	etun Me	asire									
Store Save	Save as	Storing Sys. mon.	RET IN	Analog in User inputs	+÷ πΣ Math Trig	June 2007	+ More	Remove					
MU1 MU2 MU3	MU4 M	US MU6 MU7 MU8	B MU9	MU10 MU11 MU12	2 MU13 MU1	14 MU15	1						
Channel prefix [Ho Sample rate 20	istName]	√ kHz N	Storing type view type	always fast Tree view	~								
+ Transferred	Color	Name		0	Description		Sar	ple rate	Transfer rate		Values		Zero
4		Channels/Local											
4	_	AI		CIDILIC HD CTCC Malhan	10 V Anti star	ning films (111	D)	0000	4.1		0.0417		7
ranster		EVENTIOG		aircuamoral GS (Voltage	e; 10 v Anti-ala:	ang niter (III	KJ	.0000	TUI	-10,0000	-	10,0000	2010
- Transfer		MU1:Data events						10	ful		not available		Zero

Image 47: We have 15 measurement units connected over the Dewesoft NET

As we have said before there is a section of many MU tabs. If you have more than one measurement unit, their names will be shown in this section as tabs. The local computer is our master client, and in our case does not have any real measurement channels of its own. Besides here you can define those channels as Transfer or not, which you will get to know with in the next section <u>What does the Transferred Channel mean?</u>.

However, it still has a Math button.

It is interesting to note that you can perform math functions in real-time on this client using any channels that are transferred from the measurement units! You can even combine channels from more than one measurement unit here in math channels - as long as the measurement units are synchronized!

#### Flat List - list of all the Analog Inputs on a master client

Besides the NET tab, you have also a Flat list of all the Analog inputs that are consistent with your measurement units, where you can also define your remote inputs. Just simply click on Analog in tab and set up the channels remotely.

In our example on image 48, we have 15 measurement units in our Dewesoft NET system. In the *flat list* that is located under 'Analog in', we are now able to see *all analog channels from all measurement units*.

Setting up the channels is basically the same as if you would have a standalone unit. You can activate channels with the Used / Unused buttons, scale them using the Setup buttons, and so on. You can also set the dynamic and reduced sample rates, choose a filename, and more. In this example, our Master Client is a computer with more than 2000 analog input channels.

In addition, as we have mentioned before the Math channels can also be created, where you can use any channel from any measurement unit.

Measure	Analyse Setup file	ft es Ch.setup M	Measure													War	ning -	- 🗇	× Options
Store Save	Save as Storing St	ys. mon. NET	M Analog in	User inputs Mat	🗄 📕	fore Remove													
Dynamic acquisition	rate Channel action Bandwidth	u an thu chu		- Annual -															
(kHz) •	7812 Hz Dalanc	e ampliners Short	con Zero ai	Reset zero al															
Search	9																		
ID	Measurement unit	Name	Used	C Sample rate	Ampl. name 🔳	Range	Measurement	Min	Values	Max	Physical quantity	Units	Sensor S/N	Zero 🔳	Setup				^
MU1:A-1	MU1	AI A-1	Used	20000	SIRIUS-HD-STGS	10 V	Voltage	-10,00	0,0412	10,00		v		Zero	Setup				
MU1:A-2	MU1	AI A-2	Unused	20000	SIRIUS-HD-STGS	10 V	Voltage	-10,00	-0,1613	10,00		v		Zero	Setup				
MU1:A-3	MU1	AI A-3	Unused	20000	SIRIUS-HD-STGS	10 V	Voltage	-10,00	-0,0533	10,00		v		Zero	Setup				
MU1:A-4	MU1	AI A-4	Unused	20000	SIRIUS-HD-STGS	10 V	Voltage	-10,00	-0,1139	10,00		v		Zero	Setup				
MU1:A-5	MU1	AI A-5	Unused	20000	SIRIUS-HD-STGS	10 V	Voltage	-10,00	-0,1472	10,00		v		Zero	Setup				
MU1:A-6	MU1	AI A-6	Unused	20000	SIRIUS-HD-STGS	10 V	Voltage	-10,00	-0,1706	10,00		v		Zero	Setup				
MU1:A-7	MU1	AI A-7	Unused	20000	SIRIUS-HD-STGS	10 V	Voltage	-10,00	-0,0224	10,00		v		Zero	Setup				
MU1:A-8	MU1	AI A-8	Unused	20000	SIRIUS-HD-STGS	10 V	Voltage	-10,00	-0,0183	10,00		V		Zero	Setup				
MU1:A-9	MU1	AI A-9	Unused	20000	SIRIUS-HD-STGS	10 V	Voltage	-10,00	-0,0006	10,00		v		Zero	Setup				
MU1:A-10	MU1	AI A-10	Unused	20000	SIRIUS-HD-STGS	10 V	Voltage	-10,00	-0,1009	10,00		v		Zero	Setup				
MU1:A-11	MU1	AI A-11	Unused	20000	SIRIUS-HD-STGS	10 V	Voltage	-10,00	-0,0614	10,00		v		Zero	Setup				
MU1:A-12	MU1	AI A-12	Unused	20000	SIRIUS-HD-STGS	10 V	Voltage	-10,00	-0,0420	10,00		v		Zero	Setup				
MU1:A-13	MU1	AI A-13	Unused	20000	SIRIUS-HD-STGS	10 V	Voltage	-10,00	-0,1967	10,00		V		Zero	Setup				
MU1:A-14	MU1	AI A-14	Unused	20000	SIRIUS-HD-STGS	10 V	Voltage	-10,00	-0,1341	10,00		v		Zero	Setup				
MU1:A-15	MU1	AI A-15	Unused	20000	SIRIUS-HD-STGS	10 V	Voltage	-10,00	-0,1781	10,00		v		Zero	Setup				
MU1:A-16	MU1	AI A-16	Unused	20000	SIRIUS-HD-STGS	10 V	Voltage	-10,00	-0,0818	10,00		V		Zero	Setup				
MU1:8-1	MU1	AI B-1	Unused	20000	SIRIUS-HD-STGS	10 V	Voltage	-10,00	-0,0700	10,00		v		Zero	Setup				
MU1:B-2	MU1	AI B-2	Unused	20000	SIRIUS-HD-STGS	10 V	Voltage	-10,00	-0,1782	10,00		v		Zero	Setup				
MU1:B-3	MU1	AI B-3	Unused	20000	SIRIUS-HD-STGS	10 V	Voltage	-10,00	-0,2110	10,00		v		Zero	Setup				
MU1:8-4	MU1	AI B-4	Unused	20000	SIRIUS-HD-STGS	10 V	Voltage	-10,00	-0,2815	10,00		V		Zero	Setup				
MU1:B-5	MU1	AI B-5	Unused	20000	SIRIUS-HD-STGS	10 V	Voltage	-10,00	-0,1448	10,00		v		Zero	Setup				
MU1:8-6	MU1	AI B-6	Unused	20000	SIRIUS-HD-STGS	10 V	Voltage	-10,00	-0,0069	10,00		v		Zero	Setup				
MU1:8-7	MU1	AI B-7	Unused	20000	SIRIUS-HD-STGS	10 V	Voltage	-10,00	-0,1473	10,00		v		Zero	Setup				
MU1:B-8	MU1	AI B-8	Unused	20000	SIRIUS-HD-STGS	10 V	Voltage	-10,00	-0,0887	10,00		v		Zero	Setup				
MU1:8-9	MU1	AI B-9	Unused	20000	SIRIUS-HD-STGS	10 V	Voltage	-10,00	-0,0924	10,00		v		Zero	Setup				
MU1:8-10	MU1	AI B-10	Unused	20000	SIRIUS-HD-STGS	10 V	Voltage	-10,00	-0,2356	10,00		v		Zero	Setup				
MU1:8-11	MU1	AI B-11	Unused	20000	SIRIUS-HD-STGS	10 V	Voltage	-10,00	-0,2178	10,00		v		Zero	Setup				
MU1:8-12	MU1	AI B-12	Unused	20000	SIRIUS-HD-STGS	10 V	Voltage	-10,00	-0,0791	10,00		v		Zero	Setup				

Image 48: In Analog in tab, we can preview all analog channels from all measurement units connected over the Dewesoft NET

#### What does the Transferred Channel mean?

#### Finally, we will set up the transfer from the measurement unit. What does this mean?

Transfer: "which channels will be sent across the network during recording, for storing and displaying on the client".

That is the entire scope of what transfer means. It has no effect on the storage of all channels on the measurement units (assuming that local storage is enabled - the default and highly recommended setting). This is important to understand! Therefore, you can have multiple measurement units, each with dozens or even hundreds of channels, and transfer only a few channels - or even no channels - to the client.

Transferring channels will only mean that you will be able to preview and store those transferred channels in real-time on the Master Client. The others - not transferred channels - you will be able to transfer later as the complete data file will be recorded for each measurement unit when the measurement will be done. This is described in the section How to Setup the Measurement and start Measuring? under Transfer stored data to the client.

Due to bandwidth limitations of any network, we recommend being prudent about transferring channels - keep the bandwidth in mind and select only those channels that you really need to see on the client in order to monitor and control the test.

On image 49 you can see that on the MU1 we have selected both two channels, so they will be transferred in real-time to the client. Of course, they will also be stored on the local measurement unit, because this has been selected by default on the hardware setup screen, NET page. In case we would not select them as Transfer, we would still be able to transfer them in the measure mode during and at the end of the measurement.

MU1	MU2 M	U3 MU-	MU5	MU6	MU7	MU8	MU9	MU10	MU11	MU12	MU13	MU14	MU15					
Chan	nel prefix	HostName	]		]	Sto	ring type	alway	/s fast									
amp	e rate	20		~	kHz	Viev	w type	Tree	view		~							
F	Transferred	Color			Name					De	scription				Sample rate	Transfer rate	Values	Zero
				Ch	annels/Loo	cal												
					AI													
	Transfer			M	1U1:AI A-1	1		SIRIUS-	HD-STGS	(Voltage;	10 V A	nti-aliasing	filter (IIR	)	20000	full	0,0417	10,0000 Zero
				E	VENT LOG	5												
	Transfer			MU1	l:Data eve	ents									10	full	not available	Zero

Image 49: Besides storing data on the measurement unit 1 - MU1, the channels will be transferred in real-time to the client

### How to Remotely set Displays and Channels on the measurement unit?

This is only important if you want to have a display screen on the measurement unit *for local observers* to see. If there is no one looking at the local display on the measurement unit (perhaps it is in a remote location without any people near it), then you can skip this step.

But if you want a local display on the measurement unit, you can do this is two ways:

- locally on the measurement unit, or
- remotely over the Master client.

#### Setting up a display Locally on a Measurement Unit

Open Dewesoft X locally on a Measurement Unit, and go to the **Measure** tab. Then set up the screen as you desire, using the normal <u>Dewesoft X</u> methods and conventions for screen design. The measurement will run without being stored in this way, so you can freely set up the measurement displays.

As you will switch to a measure mode over the Master client, this display will be then previewed locally on the Measurement Unit.

**NOTE**: If you want to set up the display locally on the measurement unit, you have to have disabled option 'Disable mouse and keyboard on measurement units'. Otherwise, you will not be able to switch between tabs, or click anything on the measurement unit.

O Dewesoft NET		
Remote mode	Master dient	~
Auto connect Auto connect to measurement units on start and exit o	of settings	${\boldsymbol{ \oslash}}$
Store data on slave clients		Ø
Store data on remote measurement units		${\boldsymbol{ \heartsuit}}$
Disable mouse and keyboard on measurement unit	s	0

Image 50: If you want to locally setup the measurement unit's display, disable this option

#### Setting up a display Remotely over the Master Client

You can also set up a display for a Measurement Unit remotely over the Master Client. First set up the remote connection in settings as:

- Remote Desktop Sharing,
- Remote Desktop Protocol, or
- UltraVNC (Third-party viewer).

If you are using the Remote Desktop Protocol, you will need to enter the credentials for the remote measurement unit, where the display will lock as you exit the measurement unit remote view on your master client.

Search Q	ADVANCED		
Devices	Hardware	⊗ Connection	
Extensions	Visuals Math	Starting TCP/IP port for MU data connection First NET measurement unit connects to this port on client when data transfer is initiated. Subsequent MUs connect to the next per counting downwarder. Data SB00 is	8998
Global Variables     Data header	Diagnostics	reserved as command port on MUs and slave clients. Allow NET connection in master mode	Master or view client 🗸
Startup	NET	client or master measurement unit mode Send display from slave measurement units	Ø
User interface	Experimental Performance	⊗ Cross trigger	
Files and folders	Sequencer	Selected network interface for cross trigger	Intel(R) Ethernet Connection (6) I219-V V
Storing	Warnings	Measurement units inside same multicast group will share trigger conditions when cross trigger is enabled	224.3.4.1
Reports	Export	Cross trigger delay Maximum delay for received cross trigger event	0.5
( Update		⊗ Setup screen connection	
🗙 Advanced		Keep client connection on view change (needs Dewesoft 6	64-bit version)
Licensing		Default protocol for connection	Remote Desktop Sharing 🗸 🗸
		⊗ Events	
		Accept events from dients	Master & view clients $\checkmark$
			OK Cancel

Image 51: Set the Remote Desktop Sharing if you want to simply connect to the measurement unit anytime

Search Q	ADVANCED			
Devices           Extensions	Hardware Visuals	Starting TCP/IP port for MU data connection First NET measurement unit connects to this port on client when data transfer is initiated. Subsequent MUs connect to the next port counting downwards. Port 8999 is	8998	^
Global variables	Math Diagnostics	Allow NET connection in master mode Allow NET connection to this unit if it is in master client or master masterment unit mode	Master or view client	~
	Analysis	Send display from slave measurement units		0
Startup	NET	⊗ Cross trigger		
() User interface	Experimental	Selected network interface for cross trigger	Intel(R) Ethernet Connection (6) I219-V	~
Files and folders	Performance Sequencer	Multicast group Measurement units inside same multicast group will share trigger conditions when cross trigger is enabled	224.3.4.1	
Storing Reports	Warnings	Cross trigger delay Maximum delay for received cross trigger event	0.5	
Security	Export	⊗ Setup screen connection		_
(f) Update		Keep client connection on view change (needs Dewesoft	64-bit version)	Ø
🗙 Advanced		Default protocol for connection	Remote Desktop Protocol	$\sim$
<b>•</b>		Use Windows creditentials		0
		Default user name	Dewesoft	
		Default password	••••	
		⊗ Events		
		Accept events from dients	Master & view dients	~
				~
			ОК	Cancel

Image 52: In order, you want to set credentials and lock measurement unit's display once you set up the MU channels and display, choose the Remote Desktop Protocol

If you go to the Channel setup -> NET on a Master Client you have 3 screen views to choose between:

- Channel list
- Remote channel setup
- Remote display setup

Maasure Anal	Dewesoft yse Setup files Ch. setup Me Storing NET Analog in	assure						Error - CI × ⊕ NET ≡ Optione
192.168.10.2 Channel prefix [HostName] Sample rate 20000	Storing type	always fast Tree view						Channel las. V Channel de Channel de La Remeter de de Value
+ Transferred Color	Name	Description	Sample rate	Transfer rate		alues	Zero	
4	Channels/Local							
Transfer	AL 192.168.10.2-AT 1	SIR1 IS HS CHG Owners 10 V: DC-1 SN: DE0000042C	20000	64		.000	Zero	
- Transfer	192.168.10.2:AI 2	SIRJUS-HS-CHG (Voltage; 10 V; DC;) SN: DF0000047D	20000	5.4	-10.000	10.000	Zero	
				Char Char Remo	inel list nel list ote chanr ote displa	el setup	~	

Image 53: Switch between three views to preview and set all the settings on the chosen measurement unit

With switching between those you can remotely connect to any of the Measurement units and set up the *channels* or *displays* like this.

Under the **Remote channel setup** on the image 54, you can also set up all the channels that are on the selected measurement unit. Basically this is the same as if you would remotely find and set the channels in input tabs on the master client, without this remote preview - see again the <u>How to Remotely Control and setup the Channels of the Measurement</u> <u>Unit?</u> section.

192.160.10.2           Spering         Androg in         Thigh         Image         Closed actors           Conclusion         Closed actors         Closed actors         Closed actors           Conclusion         Closed actors         Closed actors         Closed actors           Direct         C         Neth         Angle in         Mathematic actors           Direct         C         Neth         Mathematic actors         Closed actors           Sector         C         Neth         Angle in         Neth         Mathematic actors           Sector         C         Neth         Angle in         Nether in anne         Range         Measurement is         Min         Values         Max         Physical aunthy         Unit         Zere         Setup           1         Used         A11         SERL645CHG         10 V         Violage         -10,00         0,000         V         Zere         Setup           2         Used         A12         SERL645CHG         10 V         Violage         -10,00         0,000         V         Zere         Setup           3         Used         A14         SERL645CHG         10 V         Violage         -10,00         0,000         V<
Open openione         Provide granding         Mask         Physical quantity         Units         Zero         Setup           D         Used         C         Name         Angle         Mask         Physical quantity         Units         Zero         Setup           D         Used         C         Name         Angle         Messurement         Min         Values         Max         Physical quantity         Units         Zero         Setup           1         Used         C         Name         Angle         Messurement         Min         Values         Max         Physical quantity         Units         Zero         Setup           2         Used         A11         SRILS+56-CHS         10 V         Values         -0.00         -0.00         10.00         V         Zero         Setup           3         Used         A12         SRILS+56-CHS         10 V         Values         -10.00         -0.00         10.00         V         Zero         Setup           3         Used         A12         SRILS+56-CHS         10 V         Values         -10.00         -0.00         10.00         V         Zero         Setup           4         Used         A14
Operator provider         Operator provider         Channel Salons           20000 • Plazze         Belanca anplifes         Wort or Zero all           Bulanca         Angl, name all         Belanca         Reset zero all           Bulanca         Angl, name all         Range all         Max         Physical quantity           Bulanca         All         SERUE+S-CHS         10.0         0.000         V         Zero         Setup           1         Used         All         SERUE+S-CHS         10.V         Voltage         -10.00         0.000         V         Zero         Setup           3         Used         All         SERUE+S-CHS         10.V         Voltage         -10.00         0.000         V         Zero         Setup           4         Used         All         SERUE+S-CHS         10.V         Voltage         -10.00         0.000         V         Zero         Setup           5         Used         All         SERUE+S-CHS         10.V         Voltage         -10.00         0.000         V         Zero         Setup           6         Used         All         SERUE+S-CHS         10.V         Voltage         -10.00         0.000         V         Zero
D         Used         C         Name         Anpl. name         Range         Messurement         Mn         Values         Max         Physical quantity         Units         Zero         Setup           1         Used         A11         SSR16-H5-CHG         10 V         Voltage         -10,00         0,000         10,00         V         Zero         Setup           2         Used         A12         SSR16-H5-CHG         10 V         Voltage         -10,00         0,000         10,00         V         Zero         Setup           3         Used         A12         SSR16-H5-CHG         10 V         Voltage         -10,00         0,000         10,00         V         Zero         Setup           4         Used         A14         SSR16-H5-CHG         10 V         Voltage         -10,00         0,000         10,00         V         Zero         Setup           4         Used         A14         SSR16-H5-CHG         10 V         Voltage         -10,00         0,000         10,00         V         Zero         Setup           5         Used         A14         SSR16-H5-CHG         10 V         Voltage         -10,00         0,000         10,00         V
1         Used         A11         STRL5+FS-FK         10 V         Voltage         -10,00         0,00         V         Zero         Setup           2         Used         A12         STRL5+FS-FK         10 V         Voltage         -10,00         -0,00         10,00         V         Zero         Setup           3         Used         A13         STRL5+FS-FK         10 V         Voltage         -10,00         -0,001         10,00         V         Zero         Setup           4         Used         A14         STRL5+FS-FK         10 V         Voltage         -10,00         -0,001         10,00         V         Zero         Setup           5         Used         A14         STRL5+FS-FK         10 V         Voltage         -10,00         -0,000         10,00         V         Zero         Setup           5         Used         A15         STRL5+FS-FK         10 V         Voltage         -10,00         -0,000         10,00         V         Zero         Setup           6         Used         A15         STRL5+FS-FK         10 V         Voltage         -10,00         -0,000         10,00         V         Zero         Setup         Setup         -
2         Used         A12         SRB.45+6-0+6         10 V         Visibage         -10,00         0,001         10,00         V         Zero         Setup           3         Used         A13         SRB.45+6-0+6         10 V         Visibage         -10,00         -0,001         10,00         V         Zero         Setup           4         Used         A14         SRB.45+6-0+6         10 V         Visibage         -10,00         -0,001         10,00         V         Zero         Setup           5         Used         A14         SRB.45+6-0+6         10 V         Visibage         -10,00         -0,000         10,00         V         Zero         Setup           5         Used         A15         SRB.45+6-0+6         10 V         Visibage         -10,00         -0,000         10,00         V         Zero         Setup           6         Used         A15         SRB.45+6-0+6         10 V         Visibage         -10,00         -0,000         10,00         V         Zero         Setup
3         Used         A1 3         SRIR4-HG-HG         10 V         Voltage         -10,00         -0,001         10,00         V         Zero         Setup           4         Used         A1 4         SRIR4-HG-HG         10 V         Voltage         -10,00         0,000         10,00         V         Zero         Setup           5         Used         A1 5         SIRUS-HG-GHG         10 V         Voltage         -10,00         0,000         10,00         V         Zero         Setup           6         Used         A1 5         SIRUS-HG-GHG         10 V         Voltage         -10,00         0,000         10,00         V         Zero         Setup
4         Used         At 4         SSRL9+R-SHS         10 V         Voltage         -10,00         0,00         V         Zero         Setup           5         Used         At 5         SSRL9+R-SHS         10 V         Voltage         -10,00         -0,00         10,00         V         Zero         Setup           6         Used         At 5         SSRL9+R-SHS         10 V         Voltage         -10,00         -0,000         10,00         V         Zero         Setup
S         Used         A1 5         SIRUS-H5-CH6         10 V         Voltage         -10,00         0,000         10,00         V         Zero         Setup           6         Used         A1 6         SIRUS-H5-CH6         10 V         Voltage         -10,00         0,000         10,00         V         Zero         Setup
6 Used AI 6 SIRIUS-HS-CHG 10 V Voltage -10,00 0,000 10,00 V Zero Setup
7         Used         AI 7         SIRIUS+IS-STG+         50 V         Voltage         -50,00         0,00         50,00         V         Zero         Setup
8 - Used AI 8 SIRUS+IS-STG+ 50 V Voltage -50,00 - 0,00 V Zero Setup

Image 54: Remote channel setup

Under the **Remote display setup** on the image 55, you are able to create a display for a selected measurement unit. This display will be only previewed on the selected measurement unit, but you can later also add it in the measure mode on a master client.



Image 55: Remote display setup on a measurement unit, with the selected measurement unit's channels displayed

If you go in Measure mode on the master client - see image 56, you are able to create displays with all the channels from any measurement unit, that you have selected as 'Transfer'. This display will be only seen on a master client.



Image 56: Setup the measuring screen on a master client in a Measure tab of the Dewesoft X

It is really important that the client computer has a display that has more resolution than the measurement units! If your measurement units have 1024x768 screens, your client should have the next size up or greater, else you may run into trouble seeing some of the screen objects near the bottom when remotely controlling measurement units from the client.

The display on image 56 is the one that will appear on the screen of the remote measurement units! It is not the display that you will see here on the client.

#### Adding a Remote display to the Master Client

You can also preview whole displays that are defined on the measurement units. In order to preview all those channels applied on remotely added display, you need to have those channels set as '**Transfer**' channels and '**Send display from** slave measurement units' enabled - see the following images.

Transfer	192, 168, 100, 22:Noise	noise	20000	full	-0.9999 / 0.9998	Zero
					-1.0000 1.0000	
Transfer	192, 168, 100, 22:Sine	Sine(1)	20000	full	0.9511 / 1.0000	Zero
			20000		-1.0000 1.0000	
Transfer	102 168 100 22 Sine2	Sine(2)*2 14+5 2	20000	6.0	3.4559 / 7.1456	Zero
riansiel	172,100,100,22,30122	511-(2) 5.17+5.5	20000	- Call	2 1600 8 4400	2010

Image 57: Set remote channels from the MU's display that you want to have previewed on master client on 'Transter'

Search Q	ADVANCED			
Devices	Devices	⊘ Connection		^
Extensions	Visuals	Starting TCP/IP port for MU data connection		
Global variables	Math	when data transfer is initiated. Subsequent MUs connect to the next port counting downwards. Port 8999 is reserved as command port on MUs and slave clients.	8998	
Data header	Diagnostics Analysis	Allow NET connection in master mode Allow NET client connection to this unit if it is in master client or master measurement unit mode	None	~
U Startup	NET	Send display from slave measurement units		Ø
<b>ili</b> Performance	Experimental	Allow master to connect to this unit while storing Storing will be stopped when master connects to this unit		0
	Performance	Keep connection in analysis		0
Storing	Sequencer	⊗ Cross trigger		
Reports	Event	Selected network interface for cross trigger	Realtek PCIe GbE Family Controller	$\sim$
	Live setup statuses	Multicast group Measurement units inside same multicast group will share trigger conditions when cross trigger is enabled	224.3.4.1	
Advanced		Cross trigger delay Maximum delay for received cross trigger event	0,5	
Licensing		$\odot$ Setup screen connection		
		Keep client connection on view change (needs Dewesoft 6	54-bit version)	0
		Default protocol for connection	Windows Desktop Sharing	$\sim$
		⊗ Events		
		Accept events from clients	Disabled	~
		1	ОК	Cancel

Image 58: On the master client enable 'Send display from slave measurement unit'

🔺 Manage disp	lays		_	
$\oplus \Theta$	$\odot$			
Recorder	Display properties			
Custom	🔺 Add display		×	
Polygon		Q Add display Add subdisplay		
	General			
	Custom			
	Overview			
	Recorder		N	_
	Overload			
	Polygon_Screens			
	Polygon			
	192.168.100.22			
	All			
	RemoteDisplay			
	Custom			
	RemoteDisplay			
				ОК

Image 59: On the master client click on the Displays tab, and with plus button add a new remote display



Image 60: Remote display from a measurement unit that you want to preview also on the Master client



Image 61: Remote display previewed on the Master client

### What is Cross Trigger function?

**Cross Trigger function is an additional triggering option provided with Dewesoft NET, where** one measurement unit's (MU's) condition can inside the network trigger another measurement unit (MU).

Usually, inside the Channel setup -> Storing, we can set *global triggering conditions*, that apply to the master client in the network. But cross triggering option enabled on different measurement units in the network allows us to trigger different measurement units from defined local measurement unit conditions. To properly use a cross trigger you need to have multiple measurement units connected over the Dewesoft NET, enabled cross trigger option in storing mode of the chosen measurement unit, and also connected those units to an Ethernet switch.

In the following example, we will set Measurement Unit 6's (MU6's) analog channels as conditions to trigger the *start* of fast storing on all other 14 units and the *stop* of fast storing by:

- enabling local cross triggering on all 15 MUs,
- setting local Start storing trigger condition on MU6 analog input 2 (AI2),
- setting local Stop storing trigger condition on MU6 analog input 3 (AI3).

#### Setting up the Cross Trigger

As we want to trigger all of the measurement units in the network we need to enable cross triggering both on the master client and all other measurement units. First we will enable cross triggering on the master client by going to the Channel setup -> Storing as it is shown on image 61.

Q     Devessoft X       Vesure     Setp fire       O     P       P     P       P     P       P     P	·
Store Save Saveas Storng NET Analog in User inputs Math Trigger action More Remove	
Product das files folder v CUPEWESHIPpata \	
File same Stop storing	
Test	
Moreste a multifie Ø □ Moke new file after	
Skoning options Skoning options Skoning option Skoning option	
fast on trigger, slow otherwise 🗸 🔟 🐷 sec v Net MU Status	
Start storing automatically Adjusted to 0,2 sec	
Offlere math will not be evaluate on reduced lata Trigger rates	
Ime time         Post time         Post time extension         Oross bigger (send and receive network triggers)	喧×
200 ms - ms - ms Sind and receive stop tropper	
Startsburg conditors ( ) So totrong conditors	•

Image 62: Enter the Storing settings on the master client

Set the Storing type on 'Fast on trigger, slow otherwise', and enable Cross trigger (send and receive network triggers) and Send and receive stop trigger options - see image 62.

Storing options					
Storing type fast on trigger, slow otherwise always fast always slow fast on trigger fast on trigger, slow otherwise region active		Static acquisition rate	Net MU Status		
Pre time	Post time - ms	Holdoff time - ms	Post time extension	<ul> <li>✓ Cross trigger (send and receive network triggers)</li> <li>✓ Send and receive stop trigger</li> </ul>	

In order to make cross triggering functional between all of the measurement units, it is needed to enable the 'Cross Trigger' and 'Send and receive the trigger' options also on all 15 measurement units.

This is done by going to the NET tab, select one MU, switching on the Storing tab in 'Remote channel setup' of the selected MU, and enabling those two functions as it was done on the master client - see image 63. This should be done on all of the measurement units that you want to trigger.



Image 64: Set the Storing type on 'Fast on trigger, slow otherwise' and enable both trigger options also on all other measurement units

If you switch now from '*Remote channel setup*' to the '*Channel list*' on the right, you can see that also on the Channel list it can be previewed defined Storing type.

Image 63: Set the Storing type on 'Fast on trigger, slow otherwise' and enable both trigger options

	Q	Dewesoft X										
Measure	e Analyse	Setup files Ch. setup	Measure									
O P	E?	· 문 //		±÷	т	+ -						
Store Save	Save as	Storing NET Analo	a in Liter innute	11 2 Math	Trinner action	More Remov						
Store Sore	Save as		y 00011000	THEFT		- Horen Heenov	-					
MU1 MU2 MU	U3 MU4 M	US MU6 MU7 MU8 M	U9 MU10 MU1	11 MU13	MU14							
Channel prefix [	HostName]	Storing	type fast on trig	ger, slow oth	herwise							
Sample rate 5	5	✓ kHz View t	/pe Tree view		~							
								1				
+ Transferre	ed Color	Name			Description		Sample rate	Transfer rate		Values		Zero
1		Channels/Local										
-		AL	000000000	TCC 01 11		1 . (1 (10)	5000		1	-2.1691/2.1	605	
• Transfer		MU6:ALA-1	SIRIUS-HD-S	TGS (voltag	e; 10 v Anti-	-aliasing filter (LIR)	5000	ful	10,0000	-0.0931	10,0000	Zero
• Transfer		MU5:ALA-2	SIRIUS-HD-8	sigs (voltag	e; 10 v Anti-	-aliasing filter (IIR)	5000	tul	-10,0000	-0.0486	10,0000	Zero
Iranster		MU6:ALA-3	SIRIUS-HD-S	si GS (voitag	e; 10 v Anti	-aliasing filter (LIR)	5000	tui	-10,0000	0.0657	10,0000	Zero
• Transfer		MU6:AI A-4	SIRIUS-HD-S	STGS (Voltag	e; 10 V Anti-	-aliasing filter (IIR)	5000	ful	-10,0000	-0.0781	10,0000	Zero
• Transfer		MU5:ALA-5	SIRIUS-HD-S	sigs (voltag	e; 10 v Anti-	-aliasing filter (IIR)	5000	ful	-10,0000	-0,1560	10,0000	Zero
- Transfer		MU5:AI A-6	SIRIUS-HD-S	IGS (Voltag	ie; 10 V Anti	-anasing filter (IIR)	5000	tul	-10,0000	-0 1822	10,0000	Zero
• Transfer		MU6:AI A-7	SIRIUS-HD-S	GIGS (Voltag	e; 10 V Anti-	-aliasing titler (IIR)	5000	ful	-10,0000	-0.1934	10,0000	Zero
Transfer		MU6:AI A-8	SIRIUS-HD-S	STGS (Voltag	ie; 10 V Anti-	-aliasing filter (IIR)	5000	ful	-10,0000	0.0599	10,0000	Zero
• Transfer		MU6:AI A-9	SIRIUS-HD-S	STGS (Voltag	je; 10 V Anti	aliasing filter (IIR)	5000	ful	10,0000	-0.0569	10,0000	Zero
• Transfer		MU6:AI A-10	SIRIUS-HD-S	STGS (Voltag	je; 10 V Anti	-aliasing filter (IIR)	5000	tul	-10,0000	0,0507	10,0000	Zero
Transfer		MU6:AI A-11	SIRIUS-HD-S	STGS (Voltag	je; 10 V Anti	aliasing filter (IIR)	5000	ful	-10,0000	-0,1045	10,0000	Zero
• Transfer		MU6:AI A-12	SIRIUS-HD-S	STGS (Voltag	je; 10 V Anti	aliasing filter (IIR)	5000	ful	-10,0000	-0,1045	10,0000	Zero
• Transfer		MU6:AI A-13	SIRIUS-HD-S	STGS (Voltag	ie; 10 V Anti-	-aliasing filter (IIR)	5000	ful	-10,0000	-0,1209	10,0000	Zero
Transfer		MU6:AI A-14	SIRIUS-HD-S	STGS (Voltag	je; 10 V Anti	aliasing filter (IIR)	5000	ful	-10,0000	-0,1378	10,0000	Zero
• Transfer		MU6:AI A-15	SIRIUS-HD-9	STGS (Voltag	e; 10 V Anti-	-aliasing filter (IIR)	5000	ful	-10,0000	0,0440	10,0000	Zero
<ul> <li>Transfer</li> </ul>		MU6:AI A-16	SIRIUS-HD-S	STGS (Voltag	ie; 10 V Anti-	aliasing filter (IIR)	5000	ful	-10,0000	-0,0911	10,0000	Zero
<ul> <li>Transfer</li> </ul>		MU6:AI B-1	SIRIUS-HD-S	STGS (Voltag	je; 10 V Anti	aliasing filter (IIR)	5000	ful	10,0000	-0,01/1	10,0000	Zero
• Transfer		MU6:AI B-2	SIRIUS-HD-S	STGS (Voltag	je; 10 V Anti	aliasing filter (IIR)	5000	ful	-10,0000	-0,1527	10,0000	Zero
- Transfer	•	MU6:AI B-3	SIRIUS-HD-S	STGS (Voltag	ie; 10 V Anti	aliasing filter (IIR)	5000	ful	-10,0000	-0,1087	10,0000	Zero
• Transfer	·	MU6:AI B-4	SIRIUS-HD-S	STGS (Voltag	je; 10 V Anti	aliasing filter (IIR)	5000	full	-10,0000	-0,1426	10,0000	Zero
• Transfer		MU6:AI B-5	SIRIUS-HD-8	STGS (Voltag	ie; 10 V Anti-	aliasing filter (IIR)	5000	ful	-10,0000	-0,0817	10,0000	Zero
Transfer		MU6:AI B-6	SIRIUS-HD-S	STGS (Voltag	je; 10 V Anti	aliasing filter (IIR)	5000	ful	10,0000	-0,0991	10,0000	Zero
Transfer		MU6:AI B-7	SIRIUS-HD-6	STGS (Voltag	je; 10 V Anti-	aliasing filter (IIR)	5000	ful	-10,0000	-0,2150	10,0000	Zero
Transfer		MU6:AI B-8	SIRIUS-HD-8	STGS (Voltag	ie; 10 V Anti-	aliasing filter (IIR)	5000	ful	-10,0000	-0,0132	10,0000	Zero
Transfer	•	MU6:AI B-9	SIRIUS-HD-S	STGS (Voltag	je; 10 V Anti-	aliasing filter (IIR)	5000	ful	10,0000	-0,0173	10,0000	Zero
Transfer		MU6:AI B-10	SIRIUS-HD-8	STGS (Voltag	e; 10 V Anti-	aliasing filter (IIR)	5000	ful	-10,0000	-0,0331	10,0000	Zero
- Transfer		MU6:AI B-11	SIRIUS-HD-S	STGS (Voltag	e; 10 V Anti	aliasing filter (IIR)	5000	ful	-10,0000	-0,0309	10,0000	Zero
Transfer		MU6:AI B-12	SIRIUS-HD-S	STGS (Voltag	e; 10 V Anti	aliasing filter (IIR)	5000	ful	-10,0000	-0,1330	10,0000	Zero
Transfer		MU6:AI B-13	SIRIUS-HD-8	STGS (Voltag	e; 10 V Anti-	aliasing filter (IIR)	5000	ful	-10,0000	-0,1379	10,0000	Zero
- Transfer		MU6:AI B-14	SIRIUS-HD-S	STGS (Voltag	e; 10 V Anti-	aliasing filter (IIR)	5000	ful	-10,0000	-0,0662	10,0000	Zero
Transfer		MU6:418-15	STRTUS-HD-9	TGS (Voltag	e: 10 V Anti-	aliasing filter (TIR)	5000	6.0		-0,0560		Zero

Image 65: On the Channel list of each measurement unit you can also preview defined storing type

#### Defining Start and Stop storing Conditions

Start storing conditions can be defined on the master client or locally on the measurement units by clicking on a 'plus' button -> Setup. In the following example, MU6 will be used to trigger Fast storing on all other MUs. So, when the trigger level of 1.5V on analog input 2 (A-2) of the MU6 will be reached, fast storing will be triggered on all the MUs. Basically, as we will connect our cable with the generated signal to the A-2 input on MU6, the trigger level will be higher than 1.5V, and as we will disconnect it, it will go on zero again.

A Dewesoft X		- 🗆 ×
Measure Analyse Setup files Ch. setup Measure		문 NET 🗮 Options
	-	
Store Save Save as Storing NET Analog in User inputs Math Trigger action More I	lemove	
Folder		
Project data files folder V C:\DEWESoft\Data\	*	
File name Stop storing		
Test 0011.dxd Step straing after 2000 triagers		
Create a multifie		
	Condition setup	
Storing options	Source Trigger on	
Storing type Static acquisition rate	All chs Remote Control channels Event log Data	
Rectification of the second seco	MU6:AcqRefreshTime	
Define math will not be available on reduced data	Value Real data	
Trigger setup	MU6:AI A-10 Mode Simple edge	• •
Pre time Post time Holdoff time Post time extension	MU6:ALA-11 Positive	
200 ms - ms - ms	MU6:AI A-13 Trip level 1.	
Start trigger setup Stop trigger setup	MU6:AI A-14	
Start storing conditions	MU6:AI A-16	•
Simple edge on MI 16:41 4-2	WINGALA-2	
Trig = 1,5 V	MU6:AI A-4	
	WAT	
	Preview of data unavailable	
	••	
	<u>ę</u>	
		OK
"Don't store" conditions		

Image 66: Setting start trigger condition on MU6 over the master client

Q     Dewesoft X       Vacuure     Setto files     0. satis     Measure       Image: Construction of the set of	_		<u>-</u> — ਹਾ × ਜੁੰਮਾ€T <mark>≡</mark> Optons
Store Save save as storing net Analogin Userinputs math inggeration more	Kemove		Remote channel setup 🔍 🗙
Starring Sys. mon. Analog in Math. Trigger action More Remove Project data files folder	×		
File name Stop storing			
Test. 192. 168. 1.6 .dxd Stop storing after 2000 MB	Constituent		
Create a multifie 🕢 🗌 Make new file after	Condition setup		
Storing options	All chs at System Monitor Event lon		
Storing type Static acquisition rate		Data	
fast on trigger, slow otherwise v Auto v sec v	AcqDisplayTime	Value Real data 🗸	
Start storing automatically Adjusted to 0.2 sec	AcqStoreTime	Mode Simple edge 🗸	
Offline math will not be available on reduced data	AI A-1	Positive	
Trigger setup	AI A-10	Triplevel 1 fl 1	م د بندن
Pre ume Post ume Post ume extension	AI A-12	A A A	
Start trigger setun	AIA-15	-	
Start storing conditions	AI A-15	Lvi	•
	✓ AI A-2	TRIG.	
The Set of	4.97355 R		
		СК	
Ton't store" conditions			

Image 67: Setting local start trigger condition in remote channel setup of MU6 (directly on MU6)

We will also set a Stop storing condition on analog input 3 (AI A-3) of the MU6. The same condition as on the AI A-2 will be defined. So, when the trigger level of 1.5V on analog input 3 (AI A-3) of the MU6 will be reached, fast storing will be stopped on all the MUs and will go back to the Slow storing. Basically, as we will connect our cable with the generated signal to the A-3 input on MU6, slow storing will be present.

Operation         Devecoft X Analyse         Devecoft X Setup files         Measure           Image: Same Same Same Same Same Storing         Image: Same Same Same Same Same Same Same Same			·
MU1 MU2 MU3 MU4 MU5 MU6 MU7 MU8 MU9 MU10 MU11 MU13 MU14			Remote channel setup 🔍 🗙
Storeg         Sys. mon.         Analog in         #±         Image: Trigger action         Here         Remove			
Project data files folder v D:\/pEWESoft\/pata\	*		
File name Stop storing			
Test. 192. 168. 1.6 .dxd Stop storing after 2000 MB <	Condition rature		
Create a multifie 🖉 🗌 Make new file after	Source		
Storing options	All chs AI System Monitor Event log	Data	
Storing type Static acquisition rate	AI A-11	▲	
fast on trigger, slow otherwise v Auto v sec v	AI A-12 AI A-13	Value Real data ~	
Start storing automatically Adjusted to 0.2 sec	AI A-14	Mode Simple edge ~	
Trigger setup	AI A-15	Positive ~	
Pre time Post time Post time extension	ALA-2	Trig level 1,5 V	直×
- ms - ms - ms	AI A-4		2.11
Start trigger setup Stop trigger setup	AIA-5	Lvi	
Start storing conditions 🕀 🕒 Stop storing conditions	AI A-7	TRIG	•••
Simple edge on AI A-2 Setup Simple edge on AI A-1		v	
Thg = 1.5 V	0.0113 2		
		OK	J

Image 68: Set stop storing condition on MU6

#### Measure mode with Cross Trigger function

We have made a measurement where we were switching a cable with the generated signal on the MU6 between its analog inputs 1, 2, and 3 (AI A-1, AI A-2, and AI A-3).

As we have set 'Start of Fast storing' condition on AI A-2 and 'Stop of Fast storing' condition on AI A-3, we can see on the image 68, that switching between the analog inputs really triggered storing type. Also on every other measurement unit that had enabled 'Cross trigger' and 'Send and receive the trigger' options storing type or storing speed was changing.



Image 69: Switching between the analog channels 1,2, and 3 on MU6 triggered the start of fast storing and stop of fast storing according to set conditions

### Example of large NET system configuration

An example of a large system connected with the NET system.

Channels:

- Analog, 19 Sirius slices
- XSENS
- GPS
- ARINC
- CPAD
- Power module
- GigE cams
- Controlled via Master computer
- Sync: IRIG Master / IRIG Slave
- Three Slave measuring units
- Different SR
- Ethernet to optics extenders
- USB to optics extenders

#### System Wiring Diagram



Image 70: Large NET system configuration