

TECH NOTE :: QuantumX Data Recorder operated by Apple's iPad

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Abstract

This Tech Note describes how to operate a QuantumX Data Recorder CX22B-W by an iPad tablet from Apple wirelessly.

Intro

The computer and software market is moving towards smaller devices and more flexible user interfaces and thus flooding our private and business life.

- Wearables like Apple Watch and Samsung Gear
- Smart phone or mobile handhelds like Apple iPhone, iPod or Samsung Galaxy
- Tablet computer like Apple iPad or Samsung Galaxy Tab or Microsoft Surface in any size
- Classic notebooks and PCs with mouse and keyboard as user interface might come with touch screen

Small and medium size **devices** with **touch operation** seem to be perfect for mobile data acquisition jobs and come with great connectivity (WLAN, Bluetooth, GSM / EDGE, 4G, etc.) and many individual applications. Though, operating systems are different so and it's only Microsoft Windows with the Surface. The smaller devices are owned by Apple (iOS) and Samsung (Googles Android).

The QuantumX Data Recorder CX22B-W offers some great connectivity too with WLAN (<u>WLE200NX inside: 802.11n, 802.11g, 802.11b, 802.11a</u>), USB 2.0 and 3.0 which allow also Bluetooth connection.

The Data Recorder runs Windows Embedded 8 and the powerful catmanAP software which allows touch-operation of individual visualization and operation panels you can create during setup. So the basics are there. All we need is setting up a WLAN connection to the Data Recorder and getting access to the recorder by **Remote Desktop Operation**.

Connecting an iPad to QuantumX Data Recorder over WLAN

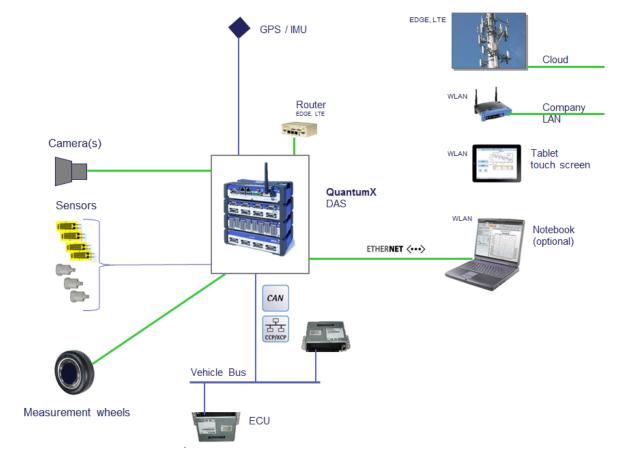
This Tech Note describes how to connect an iPad to QuantumX Data Recorder and how to work with individual graphical visualization panels.

Apples iPads offer some nice features like WLAN, high resolution, multi touch operation (2 finger zoom) and an integrated gyro to switch from vertical to horizontal view, just to name few features.

Connection to an iPad can be set up in several ways:

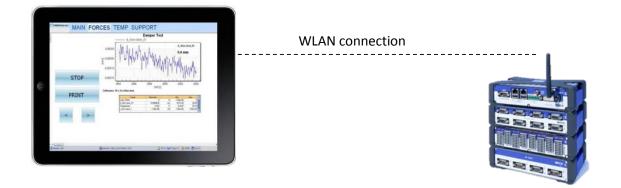
- 1. direct WLAN communication between iPad and CX22B-W, a so called ad-hoc connection
- 2. integrating CX22B-W and iPad into a WLAN hot spot or router
- 3. remote access via internet connection by tools like **Team Viewer**





The overall connection possibilities to QuantumX Data Recorder CX22B-W

Ad-hoc connection between iPad and QuantumX Data Recorder CX22B-W



The CX22B-W can also be seen as "QuantumX embedded box PC with Windows Embedded operating system". You can access the CX22B-W remotely over WLAN by a so called "ad-hoc connection" and then launch the software "Remote Desktop" to directly connect to the unit. Remote Desktop applications are available for many computers and operating systems like Windows[™] from Microsoft, iOS[™] from Apple or also Linux. On Microsoft operating systems this application is pre-installed. For Apples iOS this application has to be downloaded in the **App store**.



1st step: Configure WLAN of your QuantumX Data Recorder CX22B-W

You might have gone over the settings of the recorder already and configured the unit for ad-hoc connection between your notebook and the CX22B-W. That's easy as Windows is talking to Windows. It offers the highest comfort as both machines are finding each other easily and are exchanging their IP adresses in an automatic manner (APIPA). So not even IP configuration is necessary.



| | CX22 Settings |
|---|------------------------|
| General Remote access password catman Inf | io |
| Computer name Launch catman at startup | CX-F0F9F700E00B |
| Time to wait before starting (in s) | 10 |
| Language | EN 🗸 |
| Data folder | D:\HBM\catmanEasy\DATA |
| Activate WiFi Adhoc connection at startup | |
| Use the CX22 as QuantumX router | |
| | |
| | |
| | OK Cancel |

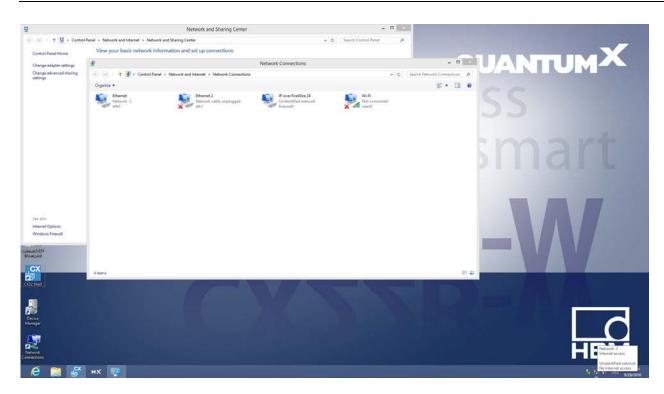
With this configuration you find the CX22B-W anytime from your notebook via WLAN and easily find and access it by **HBM Device Manager**, a Windows tool:



Preparing for iPad connection, configure WLAN of the CX22B-W with a fix IP address and parameterize it to work as "WLAN server" waiting for a direct connection (ad-hoc) over remote desktop connection.

Open Network Connections by right mouse click on WLAN icon in tray.





Go to WLAN adapter and open dialogue with right mouse click. Select "Properties"

| | <u>₽</u> | Wi-Fi Properties | |
|---|---------------------------------------|---|-----------|
| | Networki Connec | - | |
| Wi-Fi | This cor | Connection uses the following items: | onfigure |
| Not c WilanC Status Diagnose Bridge Connection Create Shortcut | s s s s s s s s s s s s s s s s s s s | Client for Microsoft Networks File and Printer Sharing for Microsoft Network Microsoft Network Adapter Multiplexor Protoc Microsoft LLDP Protocol Driver - Link-Layer Topology Discovery Mapper I/O E Link-Layer Topology Discovery Responder Internet Protocol Version 6 (TCP/IPv6) Meternet Protocol Version 6 (TCP/IPv6) Metall. | ol |
| Image: Second | wide | | e default |

Go to Internet "Protocol Version 4 (TCP / IPv4)" -> "Properties and enter IP address: **191.181.1.10** and Subnet mask: **255.255.0.0**

| Internet Protocol Version 4 (TC | CP/IPv4) Properties ? × | | | |
|---|-------------------------|--|--|--|
| General | | | | |
| You can get IP settings assigned automatically If your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings. | | | | |
| Obtain an IP address automatica | lly | | | |
| • Use the following IP address: | | | | |
| IP address: | 191.181.1.10 | | | |
| Subnet mask: | 255.255.0.0 | | | |
| Default gateway: | | | | |
| Obtain DNS server address automatically | | | | |
| Use the following DNS server add | dresses: | | | |
| Preferred DNS server: | | | | |
| Alternate DNS server: | | | | |
| Validate settings upon exit | Advanced | | | |
| | OK Cancel | | | |



You can double check the IP address or the device name of the unit in this way:

- 1. Click Start or tap the Windows button on your keyboard.
- 2. Type "Control Panel".
- 3. Click the result "Control Panel".

4. Click "System and Security", and then under System, click "See the name of this computer". The full PC name is listed under Computer name, domain, and workgroup settings.

Computer Name: CX-F0F9F700E017

(basically the prefix CX- and the MAC address your recorder, which can be found on the rear side of the recorder too)

| <u>بع</u> | | System | - D × |
|---|--------------------------------|---|----------------------------|
| 🛞 🎯 👻 🕇 🛃 ד Control Par | nel → System and Security → Sy | stem | ✓ C Search Control Panel P |
| Control Panel Home | View basic information | about your computer | Ø ^ |
| 🚱 Device Manager | Windows edition | | |
| 🚱 Remote settings | Windows Embedded 8 Star | ndard | |
| System protection | © 2012 Microsoft Corporat | tion. All rights reserved. | Windows Embedded 8 |
| 🚱 Advanced system settings | | | |
| | System | | |
| | Manufacturer: | Hottinger Baldwin Messtechnik GmbH | |
| | Model: | CX22B | |
| | Rating: | System rating is not available | |
| | Processor: | Intel(R) Atom(TM) CPU E3845 @ 1.91GHz 1.91 GHz | HBM |
| | Installed memory (RAM): | 4.00 GB (3.88 GB usable) | HBM . |
| | System type: | 64-bit Operating System, x64-based processor | |
| | Pen and Touch: | No Pen or Touch Input is available for this Display | |
| | Hottinger Baldwin Messtechni | k GmbH support | |
| | Phone number: | +49 6151-803-0 | |
| | Website: | Online support | |
| | Computer name, domain, and | workgroup settings | |
| | Computer name: | CX-F0F9F700E017 | 😚 Change settings |
| | Full computer name: | CX-F0F9F700E017 | |
| | Computer description: | | |
| See also | Workgroup: | WORKGROUP | |
| Windows Update | Windows activation | | |
| Performance Information and Tools | | The second second second | |
| 10015 | Windows is activated View | v details in Windows Activation | v |
| i de la companya de l | | | |

MOST IMPORTANT

Go back to the QuantumX Data Recorder Shell and press "Save and restart".



With this step all modifications to the operating system are permanently saved and are active right after boot up. This mechanism opens the "Enhanced Write Filter" for constant storage which protects the operating system of the Data Recorder.



2nd step: Download Remotedesktop App

We tested several Apps from "**Desktop Connect**" from Antecea Inc or "Remotedesktop" from Microsoft. You can download via the **App Store**.

| Development: Microsoft Cooperation | · · · · · · · · · · · · · · · · · · · |
|---|---------------------------------------|
| App: Remotedesktop | |
| Cost: free | |
| Platform: iPad, iPod, iPhone | |
| Tested version: 8.1.26 | |
| Size: ~ 25 MB | |
| Languages: English, German, French, Italian, Spanish, Portuguese, Japanese, | |
| Chinese, | |
| | |

3rd step: Configure WLAN of the iPad

Start the iPad and open Properties Dialogue.

Go to Wi-Fi page and connect to CX22

| iPad | | 10:19 | 75 % 💷) |
|--------------|------------|-----------------|--------------|
| Einstellunge | n | WLAN | |
| | | | |
| Flugmodus | \bigcirc | WLAN | |
| 🛜 WLAN | CX22B | ✓ CX22B | ∻ (i) |
| Bluetooth | Aus | NETZWERK WÄHLEN | |
| | | HBMopen | २ (i) |

Configure IP configuration in a static way: 191.181.1.20 and subnet mask: 255.255.0.0

| DHCP | BootP | Statisch | |
|---------------|-------|--------------|--|
| IP-Adresse | | 191.181.1.20 | |
| Teilnetzmaske | | 255.255.0.0 | |
| Router | | | |
| DNS | | | |

Start "Remotedesktop" App

Add Desktop by clicking + in the upper right corner.

Enter the IP address and the port: **191.181.1.10:3398** Enter Username: **HBMCX22** Enter your Password: *hbm* (default, can be changed in settings dialogue)



| Abbrechen | Anmeldeinfos | Fertig |
|--------------------|--------------|--------|
| | | |
| 191.181.1.10:3389 | | |
| Benutzername | HBMCX22 | |
| Kennwort | ••• | 8 |
| Benutzername und H | \bigcirc | |

Now your configuration is permanently stored in the Remotedesktop list:

| iPad | | 10:59 | 67 % 💷 |
|------|---|---------------|--------|
| ŝ | ? | Remotedesktop | 모 + |

 \sim Eigene Desktops



191.181.1.10:3389

Connect to the CX22, start catman and open a certain project you created before. You can also run catman in autostart.



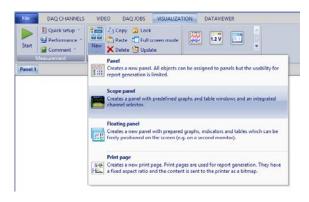


4th step: Configure catman in the way you can work in touch operation via WLAN

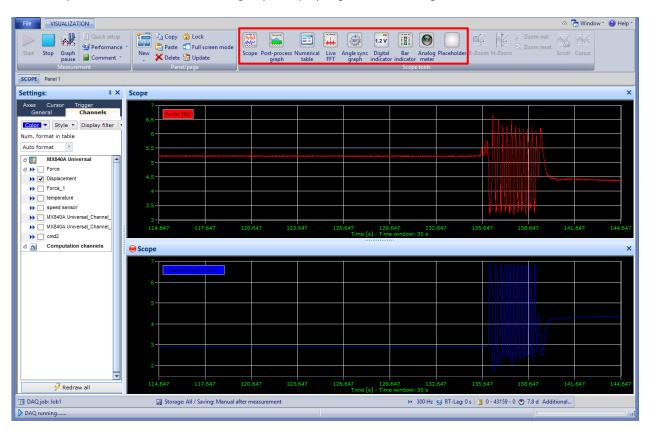
In case you didn't prepare a project for touch operation, here some steps to do so...

catman's visualization and operation allows you a freely configurable user interface. You can create several **panels** showing and solving different aspects of your test & measurement job.

The panels can be configured to work as **Panel** (freely configurable), **Scope** (oscilloscope style), **Floating panel** (for multiple screens or multiple panels showing some major signals permanently) and **Print page** (targeting a live report).



Let's start with a simple Scope and select some inputs and visualize it. You can easily add different types in a predefined style like FFT, Numerical table, angle sync display, digital indicator, Digital indicator.



Next example shows a **freely configurable Panel**. You can modify the size and style of the panel tab. You can even add pictures or pictograms if needed. We enlarge it a little so it can be operated by touch and add a LED as icon (you can some in \hbm\catmanEasy\LEDIMAGES



| Configure: Panel | ąΧ |
|--|----|
| Help for configuration 🛛 🕅 | |
| General Office | |
| Name | |
| Panel 1 | |
| ✓ Align objects to grid | |
| Show grid | |
| 200 Grid size | |
| Title | |
| Panel 1 | |
| | |
| Arial • 16 • | |
| 🛋 🍓 🛨 🖌 3 👻 | |
| 16×16 ~ | |
| Background | |
| The state of the s | |
| | |
| | |

After these preliminary settings you are ready to create your **individual user interface**. You have the following options:

| ~~~ | Real-time graph 🕨 | | |
|-------------------------|---|-------------------------|-------------------------|
| 1.2 V | Digital indicator 🕨 | | |
| | Simple table 🕨 | | Button 🕨 |
| | Flexible table 🕨 | \checkmark | Checkbox/radio button 🕨 |
| | Analog meter 🕨 | | Listbox 🕨 |
| | Bar indicator 🕨 | | Text entry field ▶ |
| . | Configure multi-bar graph 🕨 | 3 | (Script) table 🕨 |
| Щ. | Frequency spectrum (live FFT) 🖡 | | Slide control |
| | Spectrogram 🕨 | | |
| $\overline{\mathbb{O}}$ | Polar diagram 🕨 | | Rotary knob 🕨 |
| | (Real-time) cursor graph 🕨 | ettan ettan ettan | Slide switch 🕨 |
| Y | LED 🕨 | Power | On/off switch ▶ |
| | Video camera display 👂 | | LED array 🕨 |
| | but also active elements or design element: | | Canvas 🕨 |

Let's create something like a main screen with canvas, title, start and stop buttons and some visualization objects.

Select and place the **Canvas** first, select colour and style.

Then select and place the Text entry field and use it as title like "Brake Testing".

Create Drag signals from the DAQ channels list to the visualization panel and drop it: Decide what to take: Digital indicator, Real-time graph, Analog meter, Bar indicator or Table. You can also set this activity as default. You can also highlight several channels / signals in one shot.

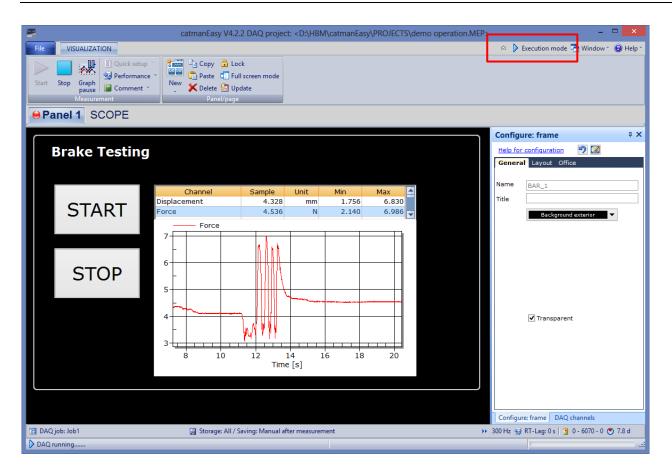


| File DAQ CHANNELS VIDEO DAQ JOBS VISUALIZATION DATAVIEWER | 🗢 🕐 Analyze measurement data ሄ Design mode 🔚 Window 🛛 🛞 Help 🚽 |
|--|---|
| Start Messurement Comment - Messurement Panel/page | |
| Alert DAQ job aborted with error! Details | × |
| ePanel 1 SCOPE | |
| Brake Testing I gital indicator Real-time graph I analog meter I arindicator I Table You can set an object as default in 'Options' -> 'Panels' | DAQ channels # X Image: Configure frame # X840A Universal Image: Configure frame # Image: Configure frame Image: Configure frame Displacement Image: Configure frame Image: Configure frame Image: Configure frame Displacement Image: Configure frame DAQ channels |
| DAQ job: No DAQ job active | → 3 S Additional |
| @ OK | |

The **Push buttons** can be used to starting and stopping data acquisition by a pre-defined action. Set the size, font and colour and then select the predefined action for the button.

| | catmanEasy V4.2.2 | DAQ project: < | <d:\hbm\ca< th=""><th>tmanEas</th><th>APROJECTS</th><th>demo operation.</th><th>MEP></th><th></th><th></th><th></th></d:\hbm\ca<> | tmanEas | APROJECTS | demo operation. | MEP> | | | |
|---------------------------------------|--|----------------|---|---------|------------------|-----------------|---------------------|--------------------------------|--------------|----------|
| File DAQ CHANNELS VIDEO DA | Q JOBS VISUALIZATIO | DATAVIEW | /ER | | | Analyze me | easurement data 🕍 D | esign mode 😤 | Window * 🧕 | 🕽 Help 🔪 |
| Start Performance Gomment | Cock C Full screen mode 2 2 Update nel/page | Visualization | objects | | | | | | | |
| | etails | | | | | | | | | × |
| ePanel 1 SCOPE | | | | | | | | | | |
| | | | | | | | Configure | command b | utton | φ× |
| Brake Testing | | | | | | | Help for con | figuration | り 🕜 | |
| | | | | | | | | ction Font/C | olor | |
| | | | | | | | Standard | | | |
| Dia | Channel olacement | Sample U | Unit I mm | Min | Max | | Stop DAQ | Jop | Configure ad | tion |
| | | | N | | | | Action stor | k(click for choo | | |
| | | | | | | - | | defined actio | | |
| | | | | | | | | Open project | : | |
| | | | | | | | | Save project Start DAQ | | |
| STOP | | | | | | | | Stop DAQ jol | | |
| 3106 | | | | | | | | Edit test par Graph pause | | |
| · · · · · · · · · · · · · · · · · · · | | | | | | | | Change to a | nalysis mod | |
| | | | | | | | | Change to m Show panel/ | | : mc |
| | | | | | | | | Show next p | | |
| | | | | | | | | Show previou | | |
| | | | | | | | | Update all gr Print preview | | ; on |
| | | | | | | | | Print current | | |
| | | | | | | | < | | | > |
| | | | | | | | Configure co | mmand button | DAQ chann | els |
| 🖻 DAQ job: No DAQ job active | | | | | | | >> 🚽 🕄 🔿 / | Additional | | |
| 👄 ок | | | | | | | | | | |

Last but not least you can place canvas and maybe your company logo and bring it the very back of all objects.



Making it plug & play we need to also parameterize the DAQ job with automatic naming.

| 1 | | | | catmanEasy V4.2 | .2 DAQ project | : <d:\hbm\c< th=""><th>atmanEasy\P</th><th>ROJECTS\de</th><th>mo operation</th><th>n.MEP></th><th>-</th><th>- 🗆 🗙</th></d:\hbm\c<> | atmanEasy\P | ROJECTS\de | mo operation | n.MEP> | - | - 🗆 🗙 |
|-------------|--|-----------------|-----------------------------------|---|----------------|---|------------------|----------------|-------------------|----------------------|----------------------------|--------------|
| File DAQ CH | ANNELS | VIDEO | DAQ JOBS | VISUALIZATION | DATAVIEWER | | | | 🛆 🔬 Anal | yze measurement dat | a 👂 Execution mode 🔁 Windo | w 🔹 🕜 Help 🔹 |
| Start X D | ew DAQ job elete DAQ jol opy DAQ job | b 😯 Up 🕹 Dow | i | Use as default Reset default settings Check | General | Storage | Channels Sett | Video tings | Job parameters | Advanced | | |
| Job list | Set | | | and saving of mea | surement dat | a | | | | | | |
| 🚾 DAQ jobs | | | age and sav | | | | | | | | | |
| Brake-Test | . F | Keep all d | data | | - | Storage mod | le | | How to sto | ire? | | |
| | | Automati | cally on DAQ | termination | | Data saving | | | How to say | <u>ve?</u> | | |
| | | Editing o | of test parame | eters after job termin | ation | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | E | HBM catm | nan standard | d format | * | File format | | | | onsider regarding th | ne format? | |
| | ٤ | 8-Byte | | | * | Precision | | | <u>What is p</u> | | | |
| | | Store all | | | • | Saving depth | ı | | What doe: | s that mean? | | |
| | | aving file | | | | | | | | | | |
| | | - | | ta\%DateTime%_%Jo | b%_%Operator | 6 | | | | | | 2 |
| | | - · | for placeholde | | | | | | | | | |
| | Autom | | placement (e.g. 0% (Name of D/ | . date or job name) | | | | | | | | |
| | | | teTime% | | | | | | | | | ^ |
| | | | % (Year) | | | | | | | | | |
| | | | n% (Month) | | | | | | | | | |
| | | | % (Day) | | | | | | | | | |
| | | | (Hour) | | | | | | | | | |
| | | | % (Minute) | | | | | | | | | |
| | | %s% | (Second) | | | | | | | | | |
| | | %hhr | mmss% (Time | 00:00:00) | | | | | | | | |
| | | %009 | % (Test counter | r) | | | | | | | | |
| | | %000 |)% (Test counte | er) | | | | | | | | |
| | | %Eve | ent% (Event/LIV | / name) | | | | | | | | |
| | | %Op | erator% (Test p | parameter) | | | | | | | | |
| | | %Dep | partment% (Te | est parameter) | | | | | | | | ~ |
| | | %Co | mment% (Test | parameter) | | | | | | | | |
| 🙆 ОК | | | | | | | | | | | | |



Every time I start and stop the DAQ job a data file is created.

You can quickly check the amount and size of files via the QuantumX Data Recorder shell - just push the Data button.



Now save your project and activate **autostart**. You can do this via File -> Options -> Program start or via the shell.

| | Options: System->Program start |
|---|---|
| System Program functions Safety Data storage Folders Program start Shortcuts CK22 | Show start screen Start mode Default start (startup screen) Execute first DAQ job automatically Switch visualization to full screen mode s waiting time before first hardware access Select the project which should be loaded on start of catmanEasy if start mode "Existing DAQ project" or "Existing analysis project" is selected or if settings are to be loaded from a project after device scan. |
| Channels and sensors ■ DAQ channels ■ Channel list ③ Sensors ④ Zero balance ■ eDAQ | DAQ project DAQ proje |
| Visualization Panels User interface Developer | Cod GUI extensions Ribbon extensions Default script Load visualization DAQ mode Analysis mode |
| Help on options | Reset to default settings OK Cancel |



| <u>•</u> | | CX22 Settings | × |
|-----------|---|--|------------------|
| Ge | eneral Remote access password catman Info | | |
| s | tart mode | Load existing DAQ project | ¥ |
| | AQ project | D:\HBM\catmanEasy\PROJECTS\demo operation | M.M. C Auto find |
| S S | tart first job automatically | 2 | |
| Start ca | elay before first hardware acces (s) | 10 | |
| | modules in project cannot be connected | Remove the missing modules temporarily from pr | roject 🗸 |
| 0. 10. | | | |
| Settings | | | |
| Settings | | | OK Cancel |

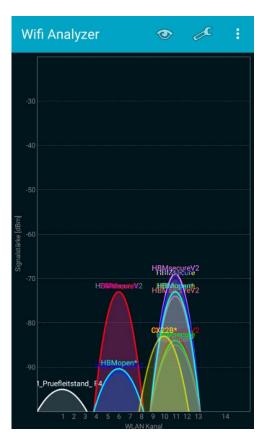
Done – have fun operating QuantumX with an iPad.





Troubleshooting

In case you have trouble connecting to the Data Recorder control your WLAN settings and the carriers used in your environment. There are plenty of tools available like **Wifi Analyzer**.



-- end

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