

Multichoice Ethernet/USB



User manual for the Web interface

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Imprint

Soft & Hardware Development Goldammer GmbH

Manual: MultiChoice ETH Series

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No liability can be accepted for damages caused by the use of the recording system or the software.

The warranty period is 24 months.

1 Getting Started

Power supply

Connect the power cord of the device to the supplied power adapter to a 230 V AC socket.

LED status display

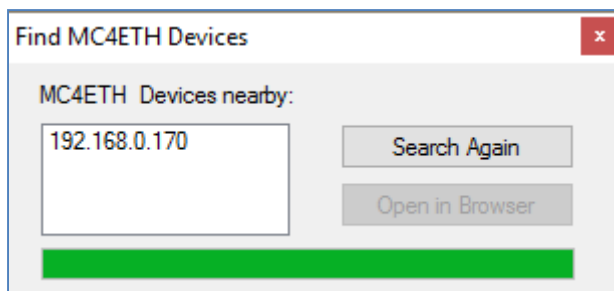
LED blinks orange: After connecting the power supply, the LED is briefly green and then flashes orange for a few seconds. Then it extinguishes briefly, then flashes orange again for a while.

When the system is ready for use, the LED changes to green.

Now you can access the system via browser or application, from here on the LED should display the two states:

- LED permanently green: System is ready for measurement
- LED permanently red: System captures data
-

Now connect the Ethernet cable to your DHCP network and start the included program "MC4ETHFinder.exe":



Double-click the IP address displayed. The program then starts the standard web browser of the system and opens the web interface of your MC4ETH.

If no DHCP Server is available/accessible in your local network, the IP address field in the MC4ETHFinder remains blank. In this case, first connect via the emergency IP to the device (see section 1.1) and manually assign an IP address that is valid in your network (see section 2.1.3.1).

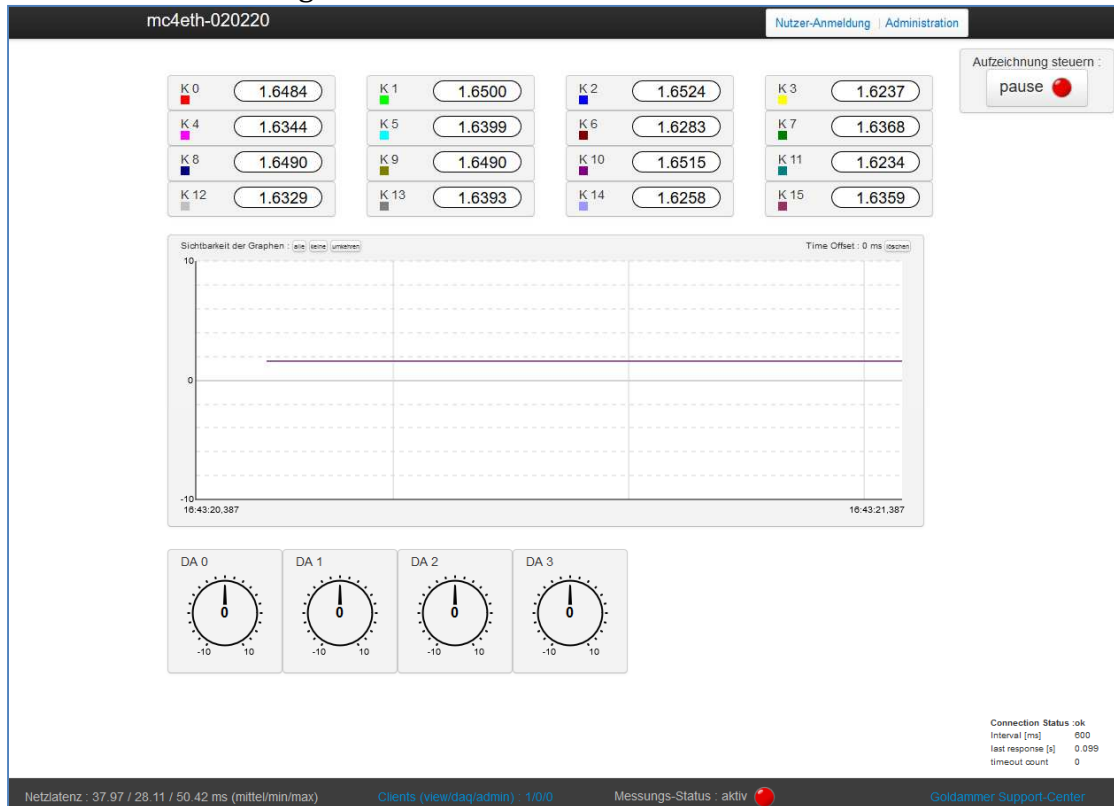
1.1 Establishing a connection using the permanently set emergency IP address

Connect the Ethernet cable directly to the Ethernet port of your PC and assign your computer any static IP address other than 192.168.0.151 in the subnet 192.168.0. *, e.g. IP Address 192.168.0.1, Subnet Mask 255.255.255.0.

Now you can access your MC4ETH in your web browser by the URL <http://192.168.0.151>.

2 Operation via the web interface

As the main page of the web interface, your MC4ETH always displays the view page of the currently active configuration. In the delivery state, this page is blank because no measurement is configured.



However, you can always see the menu bar at the top, which shows the name of your MC4ETH on the left, and the two buttons "User Login" and "Administration" on the right and the status bar at the bottom of the screen showing the measured network latency, the number of currently connected users, and the state of the measurement.

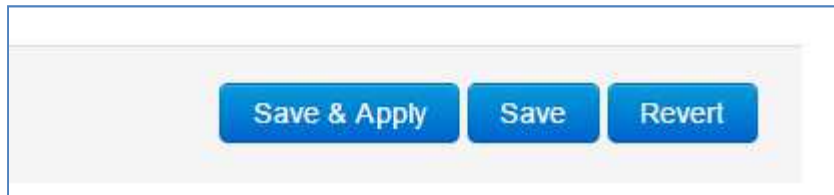
2.1 Configuration area (administration)

Its user name "admin" has already been entered. In the delivery state, the password for this user is also "admin":

The screenshot shows the 'Authorization required' login form. The title is 'Authorization required' in blue. Below the title, it says 'Please enter username and password.'. There are two input fields: 'User name' with the value 'admin' and 'Password' with masked characters. At the bottom, there are two buttons: 'log in' and 'Cancel'.

The role for this user allows the configuration of the device concerning the underlying Linux system and its behavior in the network. The procedures for this are explained in the following sections. The control and administration of measurements (login "User Login") is explained starting with section 2.3.

All pages that contain storable configuration data have buttons in the form of **"Save & Apply"**, **"Save"** and **"Revert"** at their bottom:



Configuration changes are only persisted, if either **"Save & Apply"** or **"Save"** button is pressed. The difference between both is that **"Save"** only saves the configuration, but does not restart the associated service or even the whole device. The changes will usually only take effect after the next time the device restarts. **"Save & Apply"** saves the configuration and applies the changes immediately. This may mean that the device needs to restart or, if you are changing the network configuration, that you need to re-connect to the device with a different URL. **"Revert"** discards your changes on this page and reloads the currently saved configuration.

2.1.1 Menu "Status"

After login, the "Status" menu on the main page shows the general system properties, the properties of the installed front end (inputs and outputs) and the memory usage:

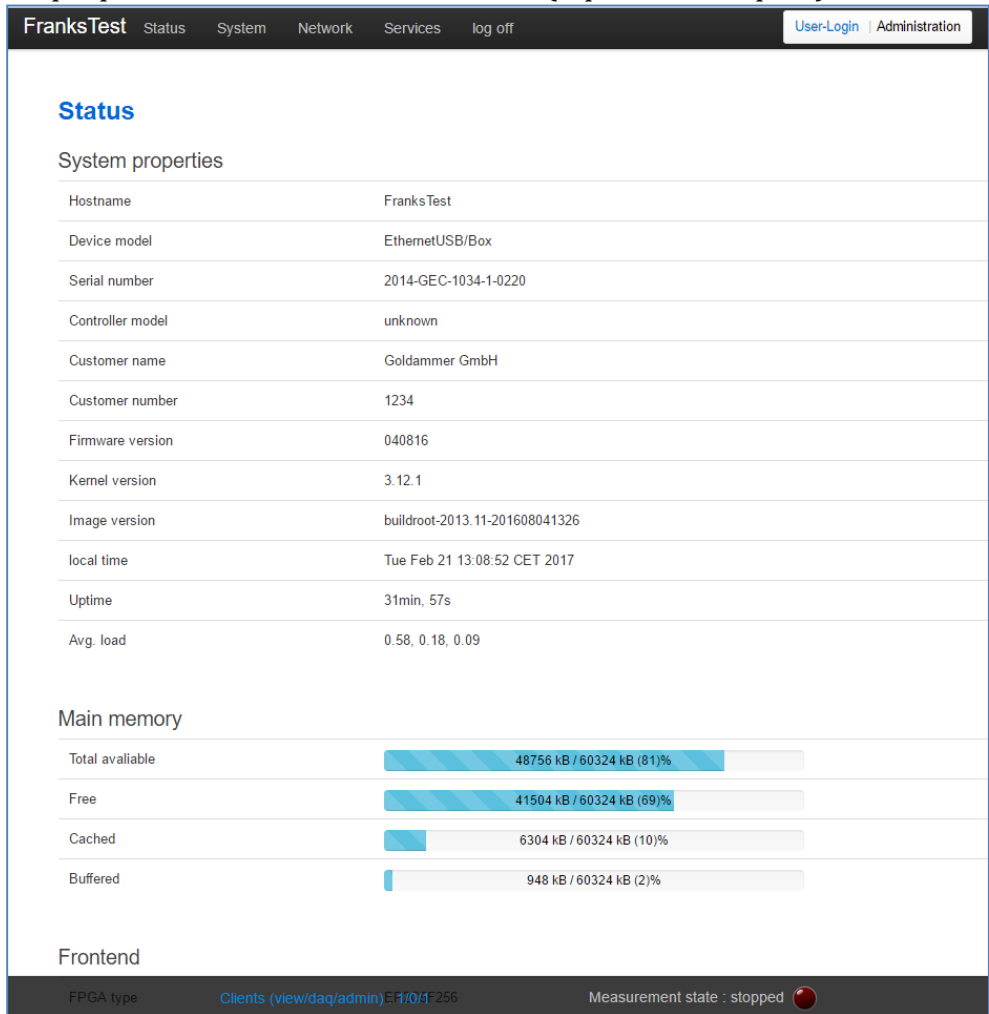


Abbildung 1: Status main page

The other menu items of the "Status" menu are:

Display of kernel log and system log of the Linux operating system, as well as a list of all active processes ("Processes"), including the possibility to abort these processes.

This option should only be used by experienced users. At the time of delivery only processes are active, which that are required. An arbitrary termination will affect the device's functionality.

2.1.2 Menu "System"

The menu **system** allows you to make important settings that determine the behavior of the system.

In addition to the possibility to change the passwords for the users **admin** and **daq** (both have their own entry in the menu **system**), the **hostname**, the **UI language**, the **system time** and the **remote device mode** (maiv2/modbus) can be changed here.

System

Here you can configure basic system settings like the host name or timezone and time synchronization.

| | |
|------------------------|--|
| Host name | <input type="text" value="FranksTest"/> |
| UI Language | <input type="text" value="user/browser selects"/> |
| system time MC4ETH | Tue Feb 21 12:41:15 CET 2017 |
| system time on this PC | Tue Feb 21 2017 12:41:15 GMT+0100 (Mitteleuropäische Zeit) <input type="button" value="set on MC4ETH as system time"/> |
| Timezone | <input type="text" value="Europe/Berlin"/> |
| remote device mode | <input type="text" value="maiv2 device"/> |

You can also transfer the system time of the PC from which you are currently connected to the MC4ETH by pressing the button "set on MC4ETH as the system time". In order for the device to periodically update its system time, it is also possible to specify one or more time servers.

2.1.2.1 Time Synchronization

Time synchronization

NTP-Client enabled

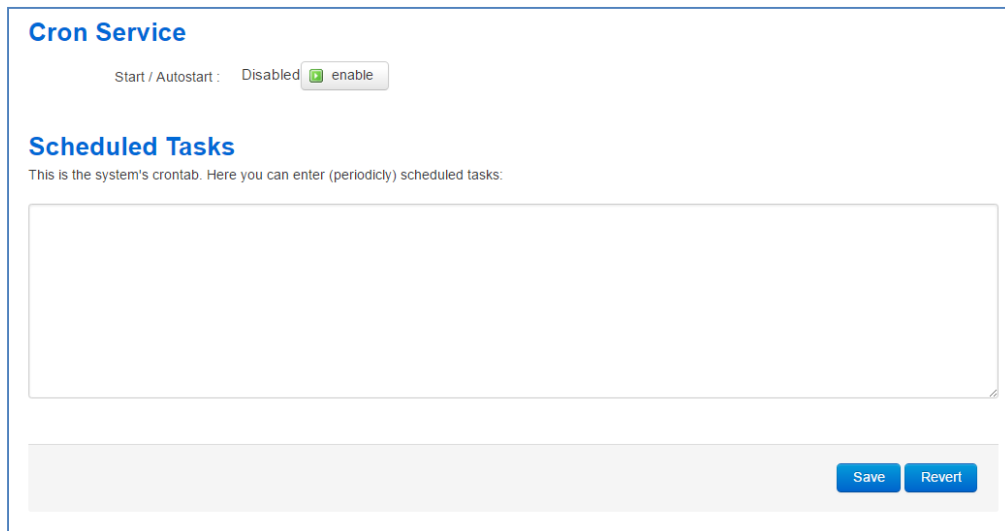
NTP server candidates

| | |
|--|---------------------------------------|
| <input type="text" value="ptbtime1.ptb.de"/> | <input type="button" value="delete"/> |
| <input type="text" value="ptbtime2.ptb.de"/> | <input type="button" value="delete"/> |
| <input type="text" value="ptbtime3.ptb.de"/> | <input type="button" value="delete"/> |

New server

To do so, activate the checkbox "NTP Client enabled", enter its hostname or IP address under "New server" and click the "Add" button. The server is then entered into the list and then used as an NTP server.

2.1.2.2 Crontab (Scheduled Tasks)



Cron Service

Start / Autostart : Disabled enable

Scheduled Tasks

This is the system's crontab. Here you can enter (periodically) scheduled tasks:

You can use the menu item "Crontab" to control the crontab and the cron service of the Linux system. Here you can start script-controlled measurement jobs by lua script, but also all other Linux tasks.

This option is for experienced Linux users only i.e. requires a basic knowledge of the Linux cron service.

2.1.2.3 Update Firmware

If you want to upload a new firmware file to your MC4ETH, you can do this via the menu item "Firmware Update". Grab the file named "mc4eth9g45-firmware.img" from the file system of your computer with the mouse and drop it in the "Drag a firmware image with the mouse into this field or click here to open a file dialog". Your MC4ETH will then accompany you step by step through the update process, which you can also cancel at any point.

2.1.2.4 Backup/Restore

You can use the "Backup/Restore" menu item to back up all the settings of the device you have created so that you can easily restore them, just like the firmware update described in section 2.1.2.3. You can either save all user data together into one archive, only the system configuration (see section 2.1), only the measurement definitions (see section 2.2) or only the SSL certificates (see section 2.1.2.6).

When restoring, the archive is checked for validity and content, and it is also possible to restore only the desired parts.

Backup or restore device settings:

On this page you can create a backup of your measurement definitions (worksheets) and device settings or restore such a backup.

Create Backup

Click "Download Backup..." to download a Backup of the chosen type:

save all user data

Download Backup...

Restore

Upload any file that was created in the above 'Backup' step:

Drag a backup archive with the Mouse into this field

or click here to open a choose file dialog

2.1.2.5 Converter Calibration

The "Converter calibration" menu item allows you to calibrate the analog / digital (ADC) and digital / analog (DAC) converters installed on the front end. Here the correct values for offset and gain must be found for each transducer so that the measured data of all channels correspond to the real measured values. The following two sections explain how to determine both.

2.1.2.5.1 Offset Calibration

Connect terminal K0 to the ground of the analog inputs and set the "offset" potentiometer so that the channel K0 display shows 0.0005V:

Converter Kalibrierung

(zum neu laden hier klicken)

| | |
|------|---------|
| K 0 | 0.0005 |
| K 1 | -4.9731 |
| K 2 | -6.3735 |
| K 3 | -6.6082 |
| K 4 | -6.3140 |
| K 5 | -5.3249 |
| K 6 | -6.4083 |
| K 7 | -5.1656 |
| K 8 | -3.8473 |
| K 9 | -3.5586 |
| K 10 | -5.4061 |
| K 11 | -6.1926 |
| K 12 | -5.7287 |
| K 13 | -6.6735 |
| K 14 | -6.2402 |
| K 15 | -6.5100 |

DA 0

DA 1

DA 2

DA 3

ADCs DACs

Potis :

| | Offset | Gain | Serial Clock Delay |
|-------|--|--|--|
| ADC 0 | Werkseinstellung Voreinstellung | Werkseinstellung Voreinstellung | Werkseinstellung Voreinstellung |

2.1.2.5.2 Gain Calibration

Now connect channel K0 to your reference voltage source and output 9.900 volts. First, connect the ground of the reference voltage source to the ground of the system. Set the "Gain" potentiometer so that the display of channel K0 indicates 9.900V:

Converter Kalibrierung
(zum neu laden hier klicken)

| | |
|------|---------|
| K 0 | 9.9008 |
| K 1 | 0.2220 |
| K 2 | -4.0462 |
| K 3 | -4.8574 |
| K 4 | -4.1595 |
| K 5 | -2.4269 |
| K 6 | -4.3316 |
| K 7 | -1.9335 |
| K 8 | 1.3048 |
| K 9 | 0.6737 |
| K 10 | -2.5985 |
| K 11 | -3.5229 |
| K 12 | -3.4179 |
| K 13 | -4.6481 |
| K 14 | -4.6893 |
| K 15 | -4.4408 |

DA 0: 0.00
DA 1: 0.00
DA 2: 0.00
DA 3: 0.00

ADCs: DACs

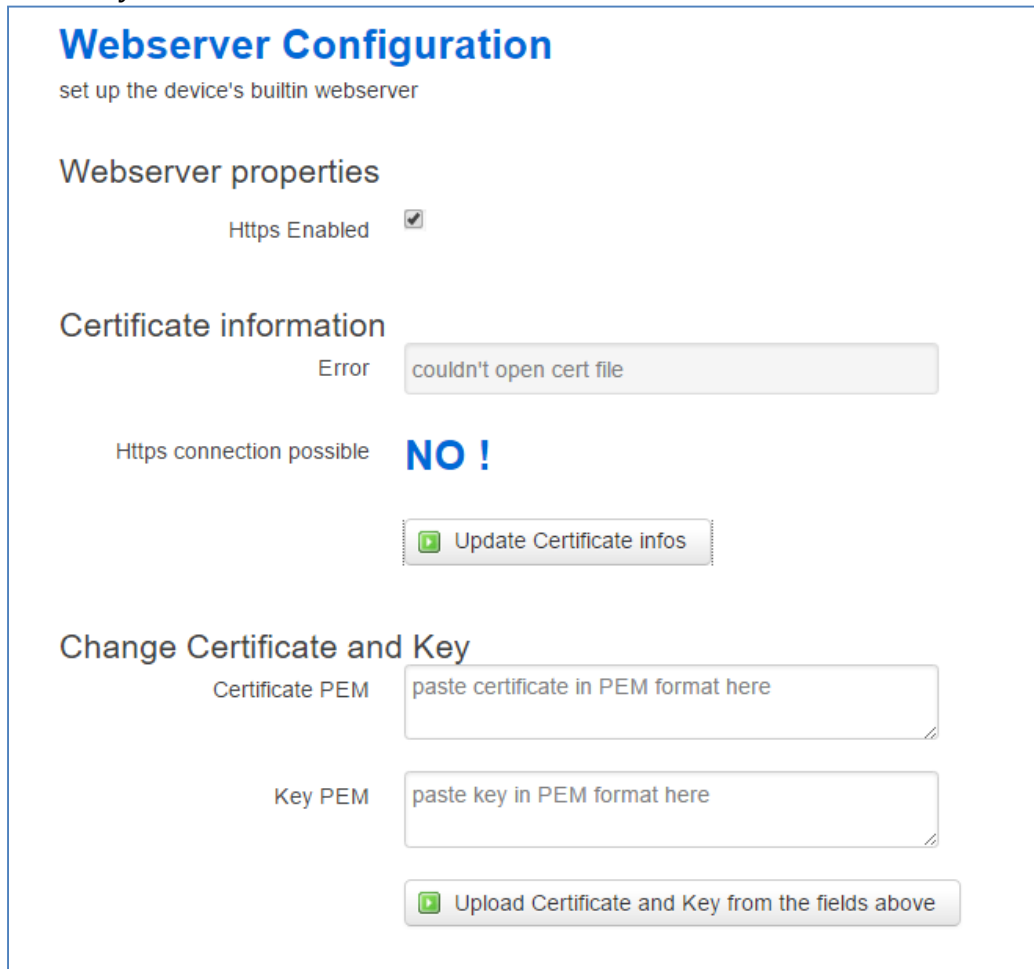
Potis:

| | Offset | Gain | Serial Clock Delay |
|-------|--------|------|--------------------|
| ADC 0 | 32 | -21 | 1 |

Werkseinstellung / Voreinstellung

2.1.2.6 Setting up a secure connection (HTTPS)

In order to make the MC4ETH accessible by means of secure connection (HTTPS) in the network, check the "HTTPS Enabled" check box on the "Webserver configuration" page in the "System" menu:



The screenshot shows the 'Webserver Configuration' page. At the top, it says 'set up the device's builtin webserver'. Under 'Webserver properties', the 'Https Enabled' checkbox is checked. In the 'Certificate information' section, there is an error message: 'Error couldn't open cert file'. Below this, it says 'Https connection possible' followed by a large blue 'NO !'. There is a button labeled 'Update Certificate infos'. The 'Change Certificate and Key' section has two text input fields: 'Certificate PEM' with the placeholder 'paste certificate in PEM format here' and 'Key PEM' with the placeholder 'paste key in PEM format here'. At the bottom of this section is a button labeled 'Upload Certificate and Key from the fields above'.

The "Update Certificate infos" button performs a test whether all necessary key files are already stored on the device. In the "Change Certificate and Key" section, you can upload new certificate information to the device

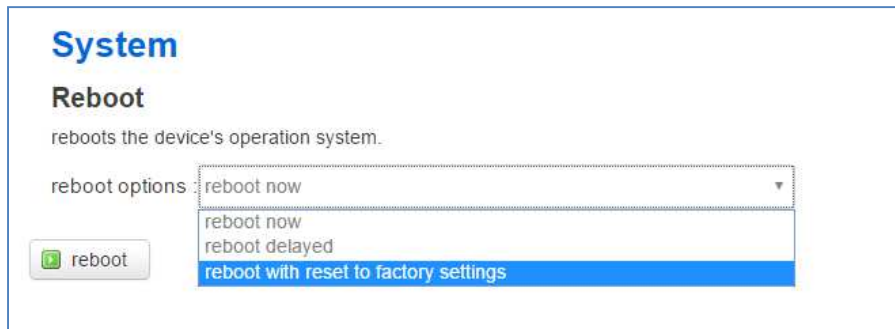
The certificate information must be inserted into the corresponding text fields in the PEM format. Note that you must have a trustworthy root certificate for effective protection. You can either generate it yourself and distribute it inside your company through a safe channel or you can purchase one from a commercial certification authority. If foreigners who do not own your company-wide certificates also shall connect securely to the device, the latter procedure is recommended. If a root certificate exists, it is used to sign the server certificate for your MC4ETH, e.g. With openssl. You can use our open source tool TLSWizard to do so:

<https://github.com/GLDopensource/TLSWizard.git>

It also offers the possibility to upload the certificate information generated by it directly to a network-reachable MC4ETH device, without manual copying and pasting into the web interface.

2.1.2.7 Reboot

Use the menu item "Reboot" to restart your MC4ETH.



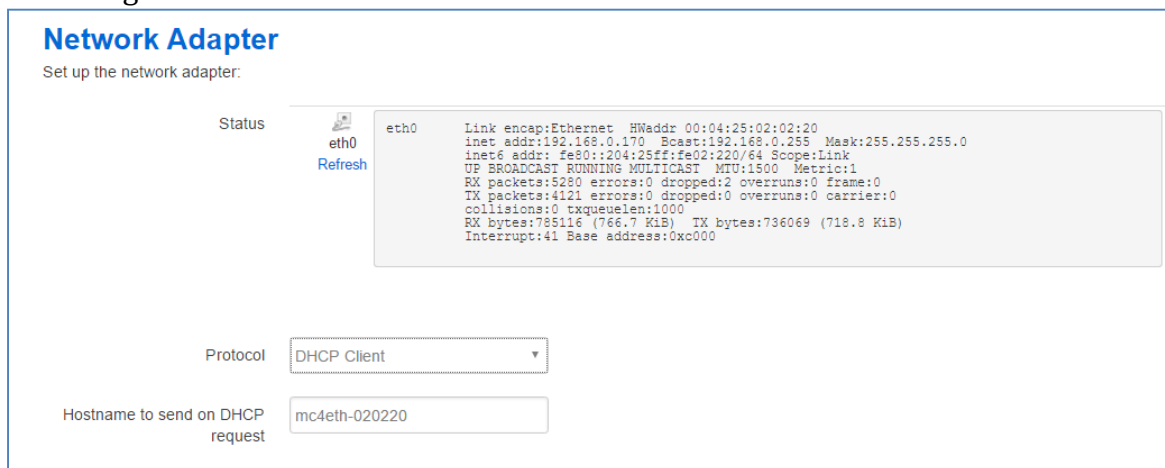
Either immediately after clicking the "reboot" button, with adjustable delay or including a reset to factory settings. In the latter case, all settings in the Admin menu are discarded and the delivery state is restored.

2.1.3 Menu "Network"

The settings in the "Network" menu should be made by your network administrator or at least be coordinated with it, so here is only a brief overview:

2.1.3.1 Adapter

The adapter settings allow the IP configuration of the MC4ETH. Basically, you can choose between DHCP and manual assignment. If DHCP is selected (default), the device obtains all settings from the DHCP server in the connected network:




You can only specify a hostname to be added to the DHCP request. **Not all DHCP servers or routers support the option to add the hostname to DNS, i.e. to access the device via this name in the browser.**

If, on the other hand, you want to assign a static IP address, the settings to be made here correspond to those of each desktop operating system:

Network Adapter

Set up the network adapter:

Status  Refresh

```
eth0  Link encap:Ethernet  HWaddr 00:04:25:02:02:20
      inet addr:192.168.0.170  Bcast:192.168.0.255  Mask:255.255.255.0
      inet6 addr: fe80::204:25ff:fe02:220/64  Scope:Link
      UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
      RX packets:5280  errors:0  dropped:2  overruns:0  frame:0
      TX packets:4121  errors:0  dropped:0  overruns:0  carrier:0
      collisions:0  txqueuelen:1000
      RX bytes:755116 (766.7 KiB)  TX bytes:736069 (718.8 KiB)
      Interrupt:41  Base address:0xc000
```

Protocol: static Address

IPv4 Address: 192.168.0.170

IPv4 Netmask: 255.255.255.0

IPv4 Gateway: 192.168.0.250

IPv4 Broadcast:

use DNS server: 192.168.0.250

New DNS server:

IPv6 Address:

IPv6 Gateway:

IPv6 routed prefix:

2.1.3.2 Diagnostics

If you can not reach your MC4ETH from any desired computer or your MC4ETH does not reach any desired computer, the "Diagnostics" menu item in the Network menu allows your network administrator to facilitate the search for causes:

Network Diagnosis

Network Tools

goldammer.de goldammer.de goldammer.de

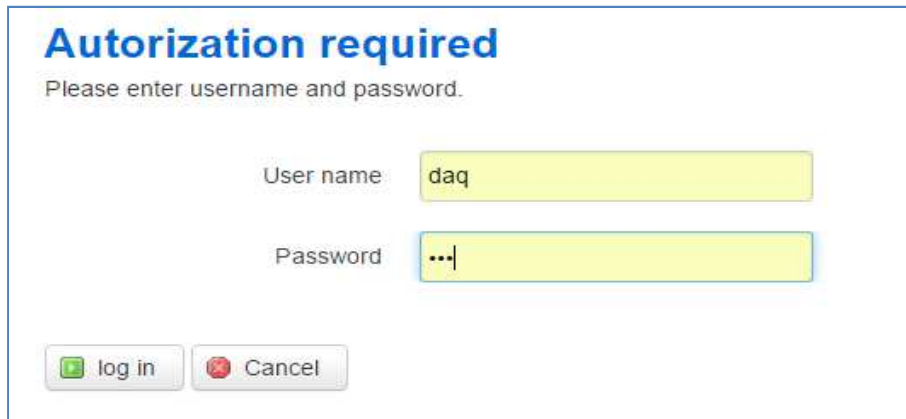
```
PING goldammer.de (213.174.55.45): 56 data bytes
64 bytes from 213.174.55.45: seq=0 ttl=53 time=21.924 ms
64 bytes from 213.174.55.45: seq=1 ttl=53 time=21.741 ms
64 bytes from 213.174.55.45: seq=2 ttl=53 time=21.779 ms
64 bytes from 213.174.55.45: seq=3 ttl=53 time=21.819 ms
64 bytes from 213.174.55.45: seq=4 ttl=53 time=21.842 ms

--- goldammer.de ping statistics ---
5 packets transmitted, 5 packets received, 0% packet loss
round-trip min/avg/max = 21.741/21.821/21.924 ms
```

The commands "ping", "traceroute" and "nslookup" can be executed by the MC4ETH and the result is displayed on the page..

2.2 Measurements in autonomous operation mode (User-Login)

Clicking on the link "User-Login" in the header of the web interface opens the login page for the measurement user:

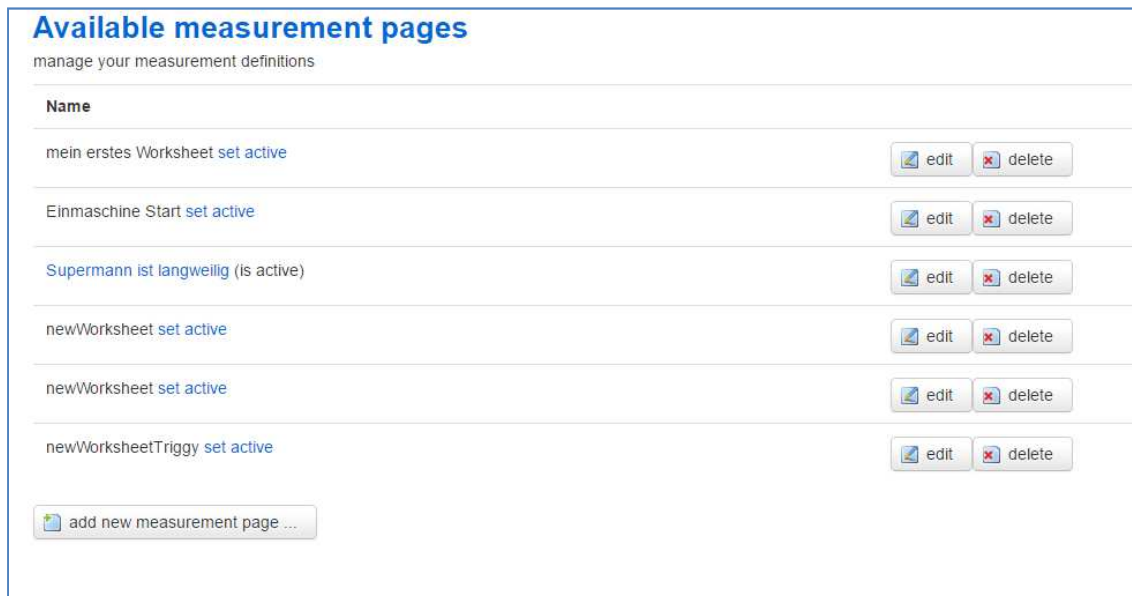


Its user name "daq" has already been entered. In the delivery state, the password for this user is also "daq".

In contrast to the user "admin", this user is only allowed to manage measurement definitions and recorded data. The procedure for this is explained in the following sections.

2.2.1 Managing the Measurement Definitions (Worksheets)

The menu item "Measurement pages" shows all measurement configurations (later in this text and in the user interface they are called Worksheets) that are stored on the device:



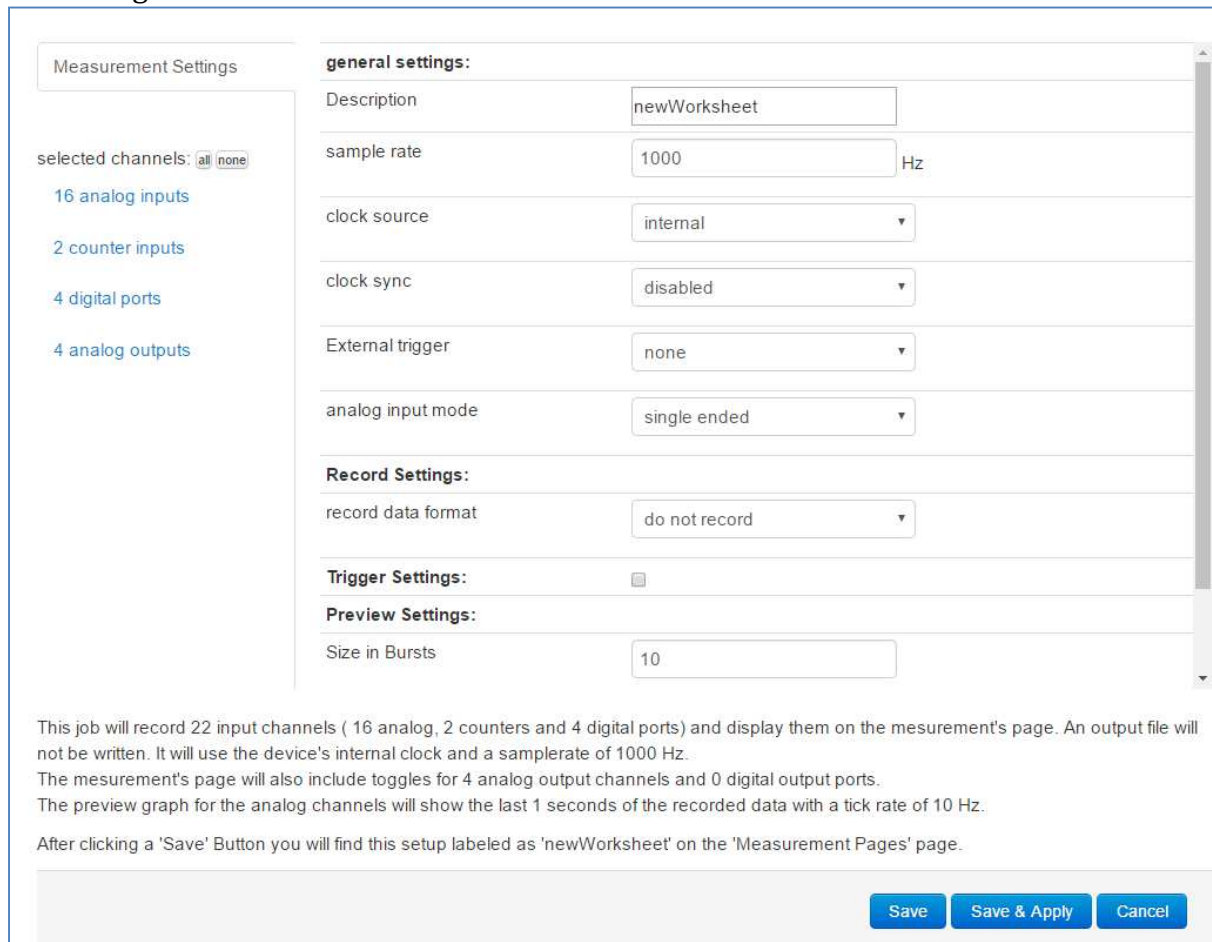
| Name | edit | delete |
|--|------|--------|
| mein erstes Worksheet set active | | |
| Einmaschine Start set active | | |
| Supermann ist langweilig (is active) | | |
| newWorksheet set active | | |
| newWorksheet set active | | |
| newWorksheetTriggy set active | | |

The currently active measurement definition is displayed as a hyperlink, which leads directly to its display page, the other measurement definitions have the hyperlink "set active" as an addition after their name. Clicking on this link will apply this configuration to the device, thus making this configuration active. On the right side of the table, the "edit" and "delete" buttons are available for each configuration, allowing you to change or delete the respective configuration.

Below the table is the "add new measurement page ..." button. Clicking on this creates a new measurement definition and opens its "edit" view directly.

2.2.2 Creating / Editing Measurement Definitions

In order to display the many possible settings within a measurement definition, the page for editing a worksheet is divided into several tabs:



Measurement Settings

selected channels: all none

- 16 analog inputs
- 2 counter inputs
- 4 digital ports
- 4 analog outputs

general settings:

Description: newWorksheet

sample rate: 1000 Hz

clock source: internal

clock sync: disabled

External trigger: none

analog input mode: single ended

Record Settings:

record data format: do not record

Trigger Settings:

Preview Settings:

Size in Bursts: 10

This job will record 22 input channels (16 analog, 2 counters and 4 digital ports) and display them on the measurement's page. An output file will not be written. It will use the device's internal clock and a samplerate of 1000 Hz.
The measurement's page will also include toggles for 4 analog output channels and 0 digital output ports.
The preview graph for the analog channels will show the last 1 seconds of the recorded data with a tick rate of 10 Hz.
After clicking a 'Save' Button you will find this setup labeled as 'newWorksheet' on the 'Measurement Pages' page.

Save Save & Apply Cancel

The global settings of the measurement are located in the tab "Measurement settings", the settings for the individual channels that are recorded or output are found in the tabs "n analog inputs", "n counter inputs", "n digital ports" and "n Analog outputs ", where n stands for the number of channels of the respective type configured within the corresponding tab. This allows you at any time to keep track of how much data is recorded with this worksheet.

Below the table are the buttons "Save", "Save and Apply" and "Cancel". "Save" saves your settings and returns to the page from which you accessed the "Edit" page, "Cancel" discards your settings and returns to the page from which you accessed the "Edit" page, "Save and Apply" saves your settings, applies them immediately to the device, and opens the View page of this configuration..

2.2.2.1 Measurement settings

As the first point of the measurement settings, you should give a meaningful **description** as this is the name that is displayed in the *measurement pages* table (see section 2.2.1) and which can later be used to search the records (see Fig. Section 2.2.3).

The **samplerate** option specifies the samplerate of the recorded data, the **clock source** option determines whether the internal clock or an external clock is used for this purpose.

Multiple Goldammer devices can also use a common clock provided by one of them (master device) for all other (slave devices). For this measurement mode, select the clock synchronization (**clock sync**) option according to the respective device application.

The option **External Trigger** determines whether the recording is started directly when the button is pressed in the UI or whether it is triggered by the dedicated digital input terminal. Here the options "start" for one-time start and "suspend / resume" for "record when trigger signal = HIGH" are available..

The **analog input mode** option (not available for all cards) determines whether the analogue inputs are single ended or differentially recorded. In the case of a differential measurement, the number of analogue inputs available is halved.

2.2.2.2 Software Trigger Events

While the option **External Trigger** toggles starting/stopping the *measurement* itself, the option **Trigger Settings**, allows you to define events on the state of the recorded signals to toggle the *recording of data*:

| | |
|--------------------------|-------------------------------------|
| Trigger Settings: | <input checked="" type="checkbox"/> |
| retriggerable | <input type="checkbox"/> |
| pre samples | <input type="text" value="100"/> |
| post samples | <input type="text" value="1000"/> |

The sub-option **retriggerable** determines, if the software trigger fires only once or in a loop, the options **pre/post samples** define, how many bursts before and after the event are written into the file.

When **Trigger Settings** is active, another tab sheet **n Trigger Events** is visible. In it's detail view you can define any number of trigger events:

Enter any analog input channel to be surveilled, then choose the type of the event (greater/less than threshold) set the threshold and click on **Add Trigger**. The event then is insertet tot he table below, where it can be deleted again either separately by clicking the button **Delete** at the end of its row or by clicking **delete all**, which clears the whole list:

| | |
|---|---|
| <p>Measurement Settings</p> <p>1 Trigger Events</p> <p>selected channels: <input type="checkbox"/> all <input type="checkbox"/> none</p> <p>16 analog inputs</p> <p>1 counter inputs</p> <p>4 digital ports</p> <p>4 analog outputs</p> | <p>New Trigger Event:</p> <p>on analog input channel: <input type="text" value="0"/></p> <p>type: <input type="text" value="greater than threshold"/></p> <p>threshold: <input type="text" value="3,2"/> V</p> <p><input type="button" value="Add Trigger"/></p> <hr/> <p>Trigger Events <input type="button" value="delete all"/></p> <p>when AD Channel 0 is greater than 3.2 volts <input type="button" value="Delete"/></p> |
|---|---|

2.2.2.3 Recording formats and graphical representation

When you create a worksheet, the **record data format** is always set to "*do not record*". With this option selected no data is recorded. However, measured data can be recorded onto a FAT32 formatted storage device attached to the USB Device Port. The file formats *ASCII* (text file), *DAT* (National Instruments DasyLAB) and *TDM* (National Instruments DIAdem, LabVIEW) are available.

If a data format is selected for a worksheet, but no USB storage medium is connected at start-up, no data is recorded, but the measurement is still performed.

| | |
|--------------------------|--|
| Record Settings: | |
| record data format | <input type="text" value="do not record"/> |
| Trigger Settings: | |
| retriggerable | |
| pre samples | |

do not record ▼

DAT

ASCII

TDM

do not record

Azure cloud

100

No USB storage device is required for recording in the Microsoft Azure Cloud. In this case, the connection string for connecting to the data destination specified in your Azure account must also be supplied.

For the recorded analog inputs, not only the current measured values are displayed on the view side, but also a graph with some past values. This graph can be configured in the **record preview settings**: The **size in bursts** option indicates how many values from the past are displayed, the **ticksize in bursts** specifies how many realtime bursts are omitted between the preview bursts (downsampling divisor). With a real sampling rate of 1 kHz, a divider of 100 and a preview size of 10, therefore, 10 equidistant measured values from the last past second are always displayed.

2.2.2.4 Channel selection and configuration

On the respective tab of the channel type you can add all channels individually to the configuration and also define their parameters:

The screenshot displays the 'Measurement Settings' configuration page. On the left, a sidebar lists channel types: '16 analog inputs', '1 counter inputs', '4 digital ports', and '4 analog outputs'. The main area is titled 'Analog Input' and features 'all' and 'none' buttons. Below, a table lists 16 channels (AD 0 to AD 9), each with a checked checkbox and a 'Gain' dropdown menu. The 'Gain' for AD 0-2, 4-9 is 'off', while for AD 3, the dropdown is open, showing options 'off', 'x2', 'x4', and 'x8', with 'x8' selected. A vertical scrollbar is on the right.

| Channel | Gain |
|---------|------|
| AD 0 | off |
| AD 1 | off |
| AD 2 | off |
| AD 3 | x8 |
| AD 4 | off |
| AD 5 | off |
| AD 6 | off |
| AD 7 | off |
| AD 8 | off |
| AD 9 | off |

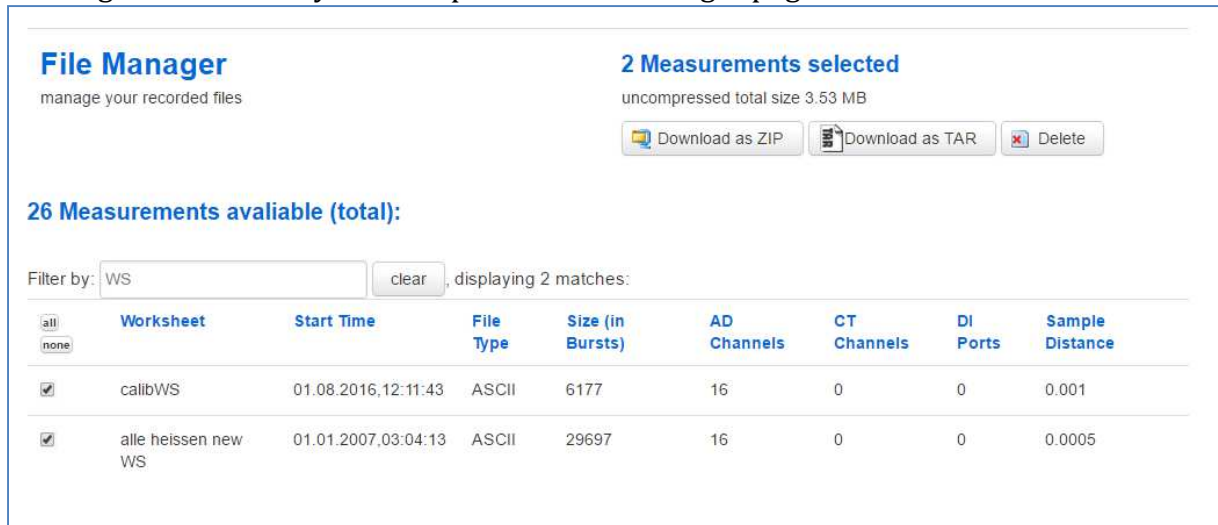
The buttons "all" and "none" are used to save clicks. They always select or deselect all subordinate channels. Only the input channels selected by their checkbox are recorded and displayed on the view page. Likewise, only the selected output channels are available as a controllable output on the view side..

The number of available channels varies per device type and can also be changed by configuration decisions already made. Thus, for example, halves the number of analog inputs for differential measurement or the number of counter inputs as soon as the first channel is configured as an incremental counter.

Non-selectable options are either dimmed (see above) or grayed out, e.g. the direction of the TTL ports is not selectable on some cards, but is displayed on the configuration page.

2.2.3 Managing recorded data

Clicking the menu entry "Files" opens the file manager page:



The screenshot shows the 'File Manager' interface. At the top left, it says 'File Manager' and 'manage your recorded files'. On the top right, it indicates '2 Measurements selected' with an 'uncompressed total size 3.53 MB'. Below this, there are three buttons: 'Download as ZIP', 'Download as TAR', and 'Delete'. A section titled '26 Measurements available (total):' contains a filter input field with 'WS' entered and a 'clear' button, followed by the text 'displaying 2 matches:'. Below the filter is a table with the following data:

| | Worksheet | Start Time | File Type | Size (in Bursts) | AD Channels | CT Channels | DI Ports | Sample Distance |
|-------------------------------------|---------------------|---------------------|-----------|------------------|-------------|-------------|----------|-----------------|
| <input checked="" type="checkbox"/> | calibWS | 01.08.2016,12:11:43 | ASCII | 6177 | 16 | 0 | 0 | 0.001 |
| <input checked="" type="checkbox"/> | alle heissen new WS | 01.01.2007,03:04:13 | ASCII | 29697 | 16 | 0 | 0 | 0.0005 |

Here you can see all recorded measurements stored on the connected USB storage device in a table with information about their start time, file type, the name of the worksheets containing the configuration, duration, recorded channels, and samplerate. If you select one or more files using the checkbox at the left side of the table, the buttons "Download as ZIP", "Download as TAR" and "Delete" are shown in the upper right corner. These start either a download of the selected files in the selected compression format or delete them from the device.

The table can be reduced via the filter input field, for example, if you enter the name of a Worksheets or the date of the recording. The filter refers to all properties of the entries and the already selected entries are retained over the filter changes. Thus, the desired files for a download archive with several filter passes can be conveniently compiled.

2.2.4 Controlling the measurement

The measurement page that is currently configured on the device can always be accessed in your browser on the main page, i.e. if the URL consists only of the IP address or hostname of the device. If you are logged on as a daq or admin user, click log off to be redirected to this page.

As the user daq, you can open the active measurement page by clicking the hyperlink in the table on the "Measurement pages" page that is followed by the text "(is active)":

Available measurement pages

manage your measurement definitions

| Name | edit | delete |
|--------------------------------------|------|--------|
| mein erstes Worksheet set active | | |
| Einmaschine Start set active | | |
| Supermann ist langweilig (is active) | | |
| newWorksheet set active | | |
| newWorksheet set active | | |
| newWorksheetTriggy set active | | |

add new measurement page ...

Depending on the active configuration, the measurement page itself looks always different: The analog inputs, labeled K0-Kn, are located at the top, below is their graph display. This is followed by the counter inputs and further below the analog output channels DA0-DAn, the TTL inputs and outputs TTL port 0 to TTL port n:

The screenshot shows the web interface for 'mc4eth-020220'. At the top, there are navigation links: 'Messungs-Seiten', 'Dateien', 'Abmelden', 'Nutzer-Anmeldung', and 'Administration'. The main content area displays 16 analog input channels (K0-K15) with their current values: K0 (1.0985), K1 (1.0979), K2 (1.0976), K3 (1.0753), K4 (1.1064), K5 (1.1281), K6 (1.0719), K7 (1.0872), K8 (1.0893), K9 (1.0887), K10 (1.0912), K11 (1.0665), K12 (1.0710), K13 (1.0771), K14 (1.0674), and K15 (1.0817). Below the channels is a graph area with a 'Sichtbarkeit der Graphen' control and a 'Time Offset: 0 ms' setting. The graph shows a flat line at 0. Below the graph are two counter displays: 'Counter 0 (Impuls)' and 'Counter 1 (Impuls)', both showing 0. At the bottom, there are four DA (Digital-to-Analog) output channels (DA 0-3) showing 0.00, and four TTL Port input channels (TTL Port 0-3) showing 0. The bottom right corner shows 'Connection Status: ok' with details: 'Interval [ms]: 600', 'last response [s]: 0.289', and 'timeout count: 0'. The footer contains network statistics, client information, and support links.

The TTL ports connected as output can be switched live here by clicking on their pin's respective square. The voltage output at the DA output can also be changed with the respective rotary knob DAn.

The recording of the analogue, counter and TTL inputs is controlled by the button "*record*" (this text changes to "*pause*" while recording). The status of the measurement is indicated by the LED graphic within this button and by the blinking (when recording) LED graphic in the footer of the web interface, which is visible on all other pages. The "*Edit settings ...*" hyperlink on the right side of the screen is only visible for the logged in user *daq*. It leads directly to the configuration page of this measurement so changes to the configuration can be applied more quickly.