

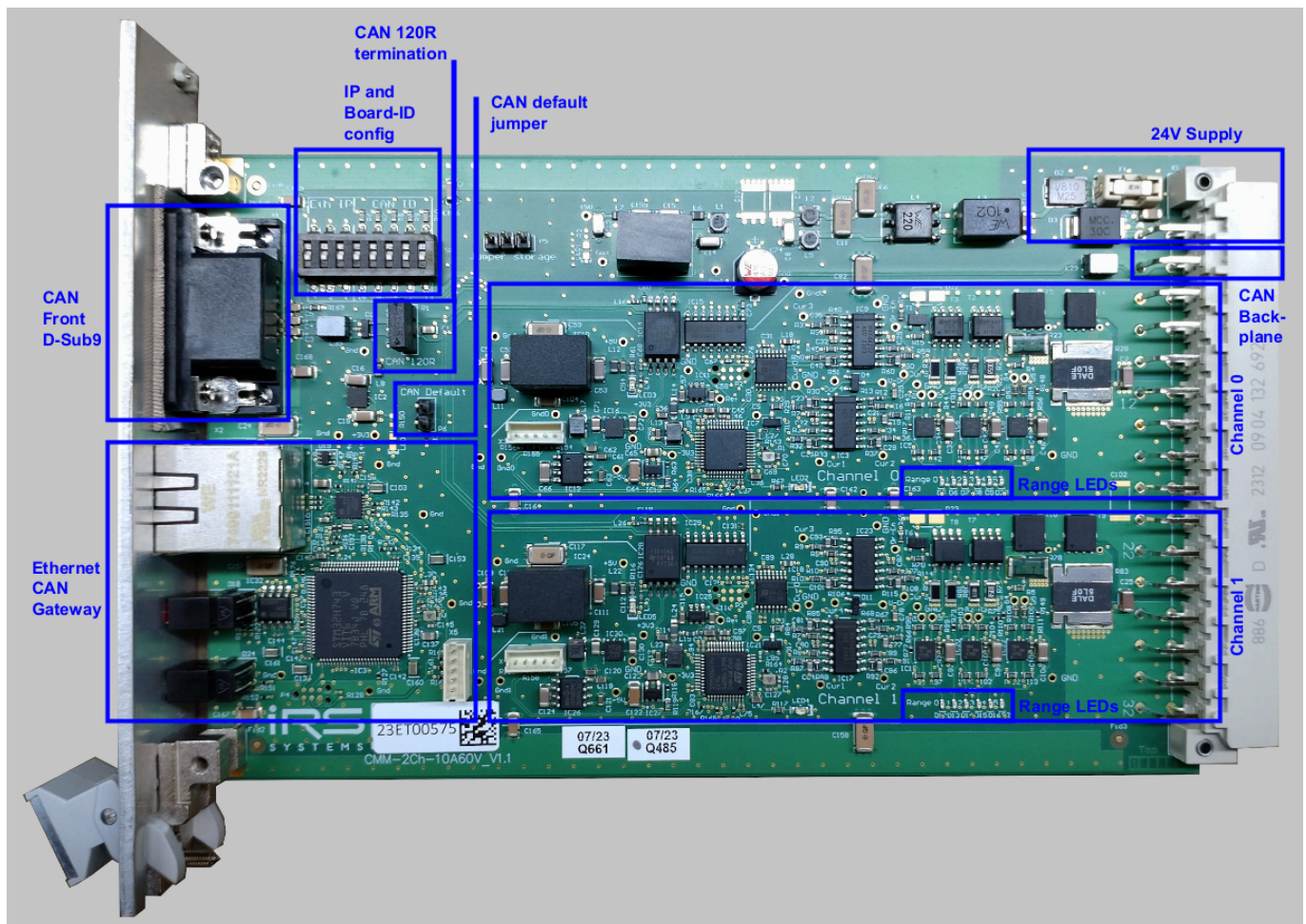
IRS.CMM-MM.GUI Manual

Warning

This manual is preliminary and subject to change without notice.

Introduction

The CMM-xCH modules are equipped with an Ethernet-CAN-Gateway and independent microcontrollers for each measurement channel. CAN-FD is used to communicate between the gateway and the channels.



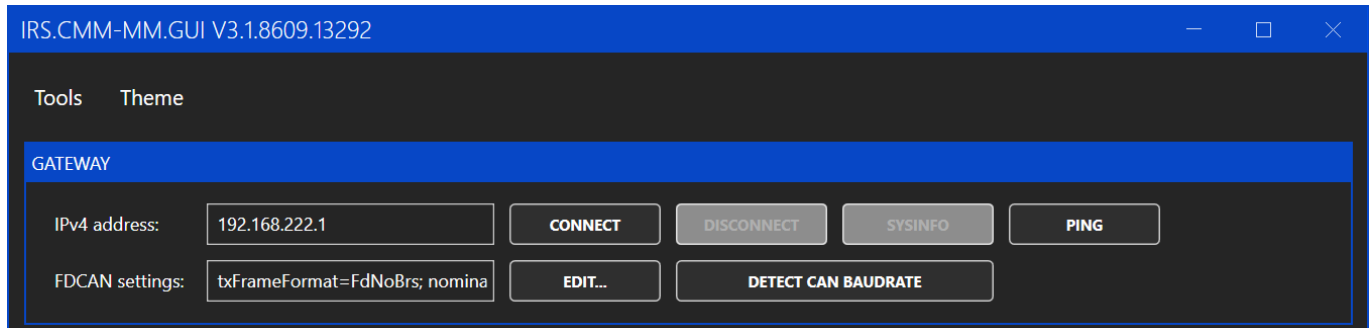
The CMM-xCH modules can be connected via Ethernet or with a direct connection to the internal CAN Bus.

For CAN-FD communication a DBC file is available on request. For communication via Ethernet the "IRS.CMM-MM.GUI" can be used. Alternatively the "IRS.CMM-MM.Lib.dll" can be used to integrate the CMM-xCH modules into your Software.

Using the IRS.CMM-MM.GUI

Connecting the module

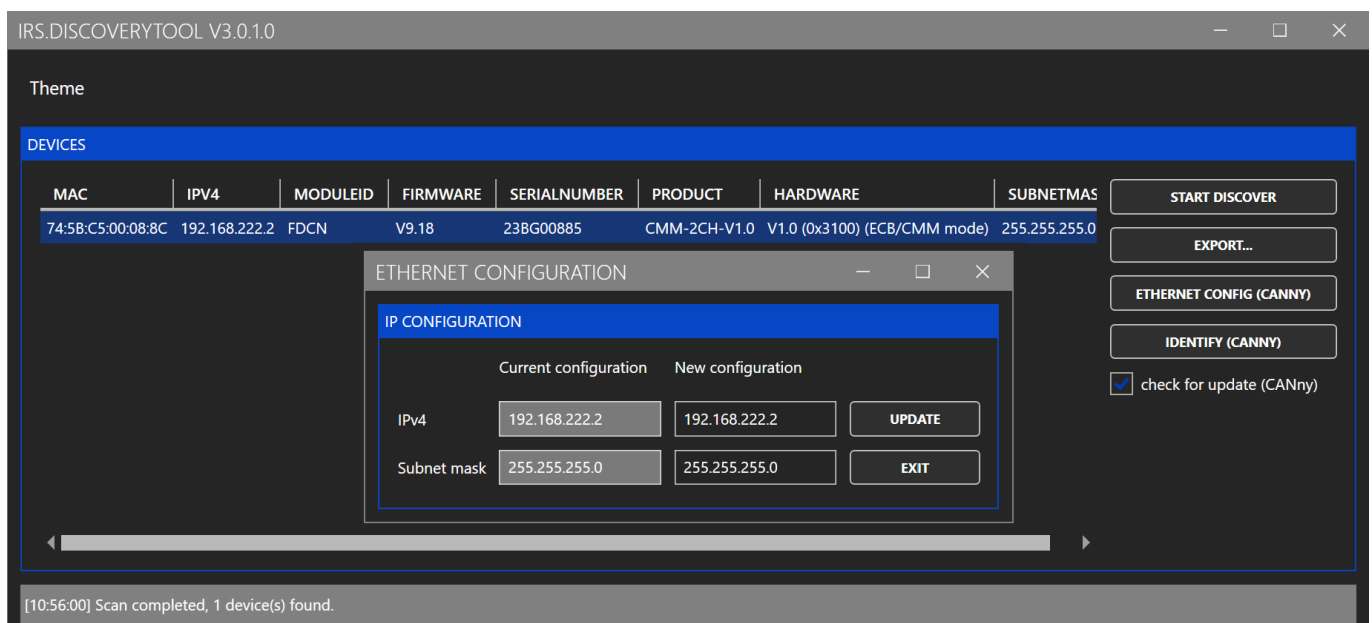
To connect to the module, enter the IP address of the module and click connect. If you do not know the IP address of the module you can use "Tools -> DiscoveryTool" to detect connected modules.



The FDCAN settings are used for the internal communication and normally the default setting can be used. If the settings were changed before, the "EDIT" button can be used to select the changed settings. If the settings are unknown the "DETECT CAN BAUDRATE" button can be used.

Changing the IP address

To change the IP address of the module, use "Tools -> DiscoveryTool". In the DiscoveryTool first click "START DISCOVER". After 10 seconds a list of all connected modules is shown. Select the module you want to change and click "ETHERNET CONFIG (CANNY)". In the following window you can enter the new IP address and click "UPDATE". You need to power cycle the module to apply the new IP address.

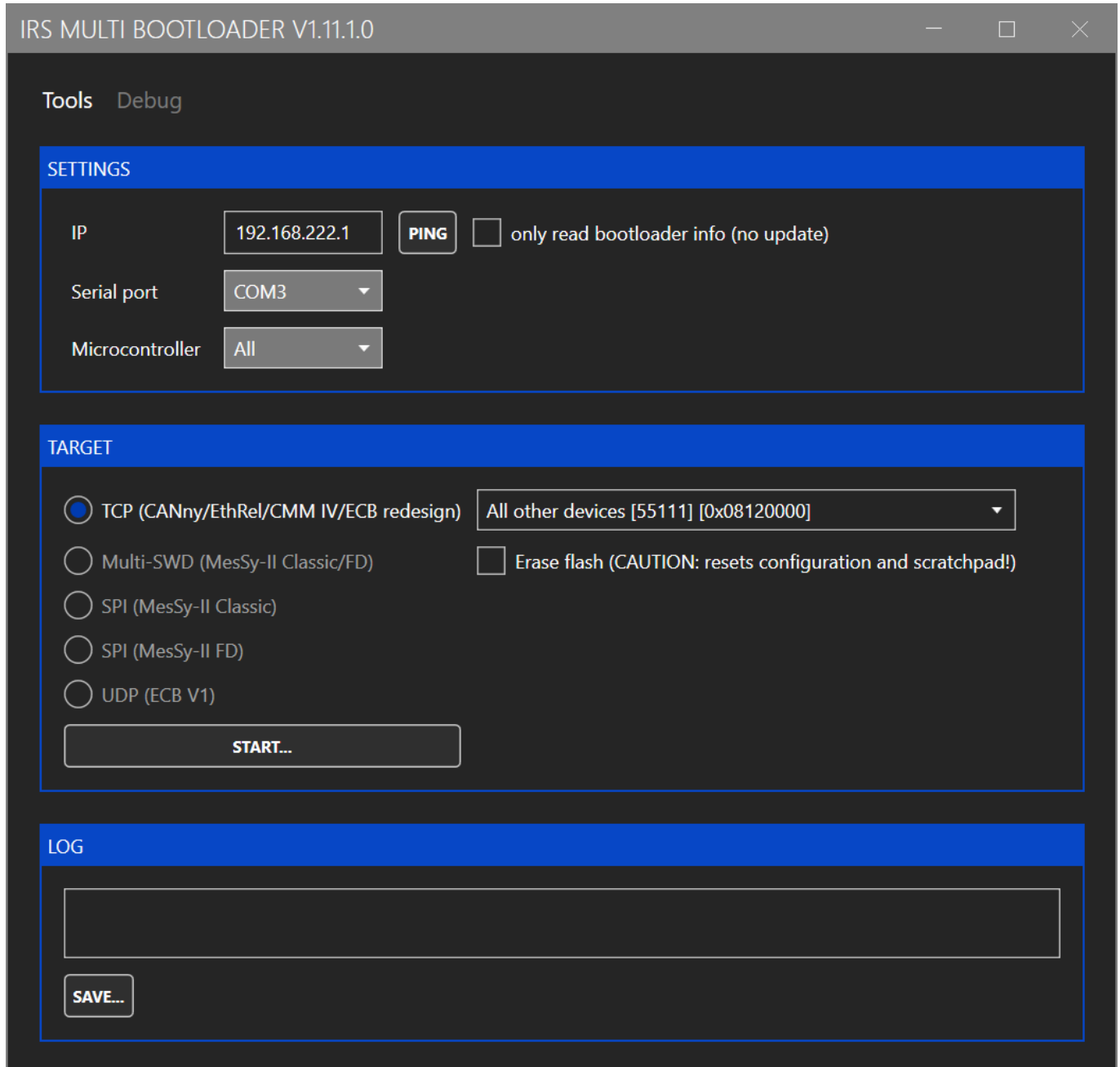


As an alternative you can configure the IP address in a limited range with the DIP switch on the PCB. The switches are treated as a binary number and marked with their place value (1, 2, 4). Depending on the set binary number an IP address between 192.168.222.1 and 192.168.222.7 is used. If all three switches are "off" the IP address configured with the DiscoveryTool is used. The switches are read at power up. So after changing the switches a power cycle is required.

Updating the firmware

Ethernet-CAN-Gateway

To update the Ethernet-CAN-Gateway firmware, use "Tools -> Update Gateway". This opens the following window:



Enter the IP address and click on "START". Select the firmware image in the file selection dialog. The firmware image is include in the folder "firmware" of the GUI installation folder and named "STM32H7-Gateway.tinyimg2".

Measurement channels

To update the firmware of the measurement channels, use "Tools -> Update CMM". This opens the following window:

IRS-FDCANBOOTLOADER-GUI V1.15.8609.12879

Bootloader Presets Style

COMMUNICATION

Programming device: CANny_EcbTcp

IP: 192.168.222.1

FDCAN controller index: 0

FDCAN kernel clock [MHz]: 40

FD mode BRS

Nominal bitrate: 1 MBit/s

Data bitrate: 4 MBit/s

START... PING verify only

PROJECT

Bootloader: FDCANStdBI

Start custom bootloader

RX global enable

RX range IDs are extended

RX ID range minimum (hex): 0x14B4D000

RX ID range maximum (hex): 0x14B4DFFF

TX ID is extended

TX ID (hex): 0x00B4DFFF

EEPROM start address (hex): 0x08040000

Module ID: MCM

LOG

SAVE LOG...

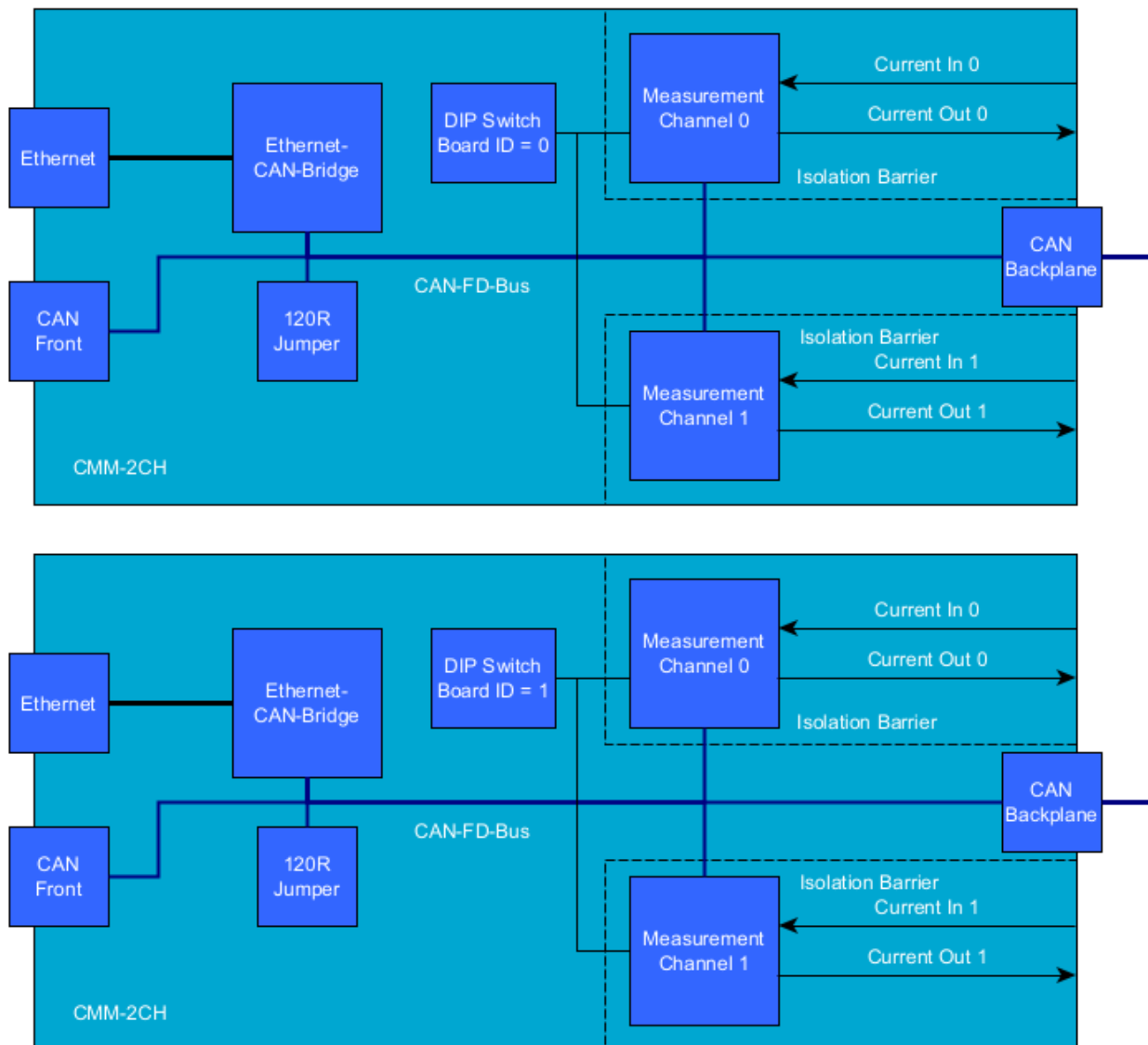
[11:03:14] Preset for CMM-MM loaded. Click 'Start' to continue.

You only need to enter the IP address of the module and then click "START". The rest of the settings should be preset to the correct values. If the settings were changed, you can reload the default values by clicking "Presets -> CMM-MM".

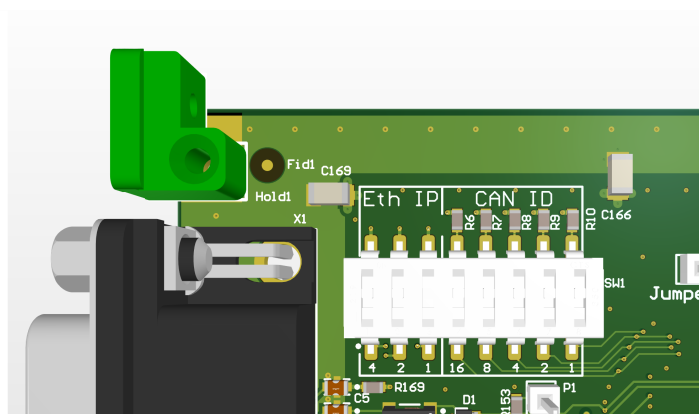
After clicking on "START", select the firmware image in the file selection dialog. The firmware image is included in the folder "firmware" of the GUI installation folder and named "STM32G4-Channel.tinyimg1".

Configure board and channel

Multiple CMM-xCH boards can be connected via CAN bus. To address the individual boards, each board needs to be configured with a unique Board ID.

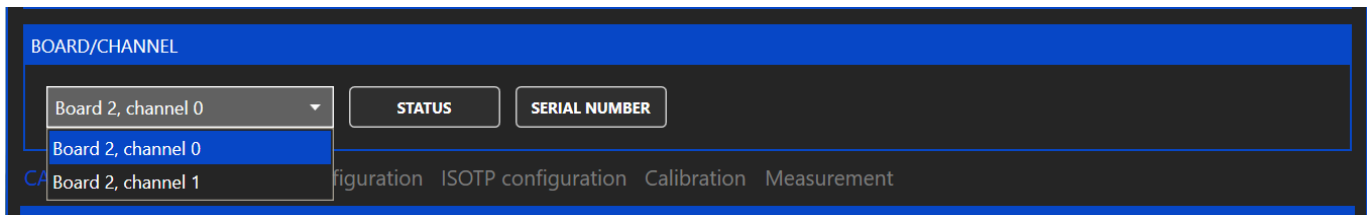


The configuration of the Board ID is done with the DIP switch on the board marked with "CAN ID". The switches are treated as a binary number and marked with their place value (1, 2, 4, ...). The switches are read at power up. So after changing the Board ID a power cycle is required.



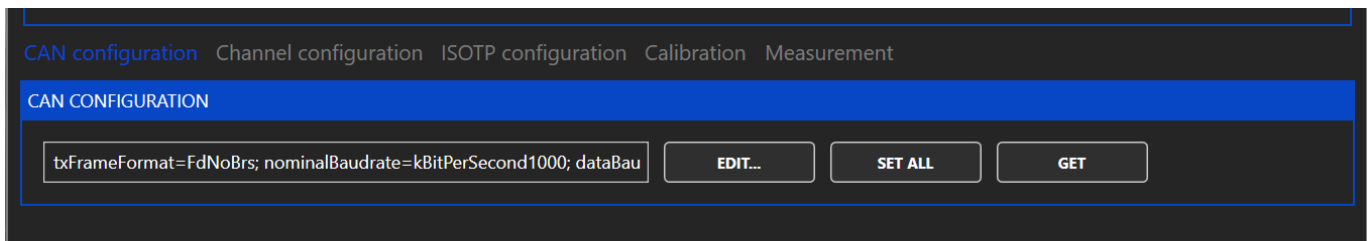
When the Board IDs are set correctly, you can use the Ethernet-CAN-Gateway of any board to communicate with all connected boards.

In the GUI click the dropdown menu under "BOARD/CHANNEL" to see a list of all detected channels and to select the channel which shall be used. The channel IDs are fixed to 0 and 1 and can not be changed. The channels are marked on the PCB with "Channel 0" and "Channel 1".



Configuring internal CAN bus

CAN baudrates and the uses of bitrate switching can be configured under "CAN CONFIGURATION".

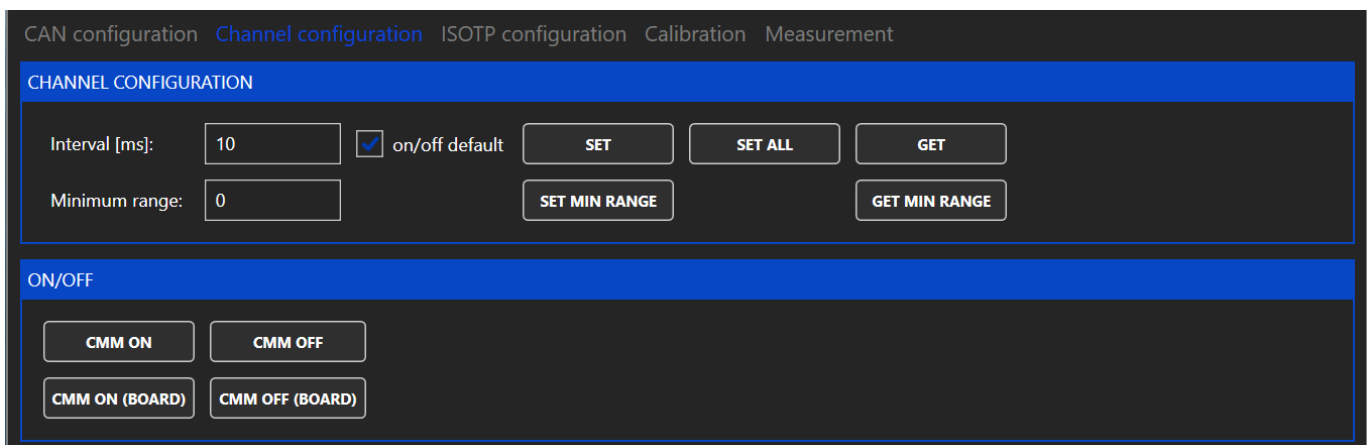


CAN configuration can only be set for all connected channels not for individual channels. Otherwise communication between the channels could get broken, if different baudrates are set.

If the CAN configuration of connected boards is messed up and a configuration with the GUI is not possible you can use the jumper marked with "CAN Default" to reset the CAN configuration of the boards. The CMM-2CH needs to be power-cycled while the jumper is connected to reset the CAN configuration to its default value.

Configuring measurement behavior

The channels of the CMM-xCH can send a cyclic CAN message with the measured values. Under "CHANNEL CONFIGURATION" the interval of these cyclic CAN messages can be adjusted. If the interval is set to zero, no cyclic CAN message are sent.



Furthermore the default state after power up of each measurement channel can be configured. If the default state is "off" the button "CMM ON" can be used to switch the measurement channel on.

The CMM-xCH modules automatically switch between ranges without interrupting then current flow in the measurement path. If however this switching is not desired, a minimum range can be set. The minimum range is reset to zero when rebooting the CMM-xCH.

A maximum range can not be set because it could easily lead to accidentally exceeding the maximum allowed current of the selected range.

Reading measured values

To read the measured values, the button "MIN/AVG/MAX" und "MEASUREMENT" can be used. A pop up window opens, which shows the measured values since the last use of the button.

The screenshot shows the 'MEASUREMENT' window with a table of data and a popup window. The table has columns: BOARD, CHANNEL, CURRENT, VOLTAGEDROP, RANGE, ONOFF, and ALIVE. The popup window displays the following information:

- Current minimum: 0,008 μA
- Current average: 0,047 μA
- Current maximum: 0,121 μA
- Voltage drop maximum: 1,554 mV
- Number samples: 243.060
- Range minimum: 0
- Range maximum: 0

For continuous monitoring of the measured values the cyclic messages can be used. To use the cyclic messages a interval different from zero must be set under "CHANNEL CONFIGURATION". The cyclic message can be read by clicking the button "UPDATE" or by enabling the checkbox "auto update".

If auto update is enabled the chart on the right shows the current of the channel selected under "BOARD/CHANNEL".

The screenshot shows the 'MEASUREMENT' window with a table of data and a chart. The table has columns: BOARD, CHANNEL, CURRENT, VOLTAGEDROP, RANGE, ONOFF, and ALIVE. The chart shows Current (A) on the y-axis (ranging from 4.2E-08 to 5.4E-08) and Time on the x-axis (ranging from 12:23:19 to 12:23:49). The chart displays a fluctuating current signal. Below the chart, the text reads: "Board 2, channel 0 (0,051 μA / 1,468 mV / range 0)".

Using legacy IsoTP communication

The CMM-xCH supports a legacy IsoTP communication mode to be compatible with software using the IsoTP communication of CMM-III. The IDs for the IsoTP interface can be configured in the GUI. For further information please contact IRS.