

# OPERATING INSTRUCTIONS

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## TC2410

- Original operating instructions -



Release date:	March 2021
PC-Software:	2.0.4.0 and higher
Firmware controller:	0.0.2.4 and higher
Firmware screwdriver:	2.2.3.0 and higher
Firmware rivet tool:	2.7.7.0 and higher

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## Disposal



Power devices, accessories and packaging must be disposed of at an environmentally-compatible recycling facility. Power devices do not go into the household trash.

### **Only for EU countries:**

#### Directive 2012/19/EU:

Defective power devices must be collected separately and disposed of at an environmentally-compatible recycling facility.

# 1 Operating principles

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Dear customers,

thank you for choosing a HS-Technik GmbH product.

This quality product „Made in Germany“ fulfils the highest requirements with regard to performance, quality and accuracy. When used correctly the product will undoubtedly perform very well for many years.

These operating instructions contain information on safety and for the operation of the BTC-Tool Controller. In addition it contains information on the dimensions and technical data. We would be happy to assist you with additional information or to answer your questions. Our technical support and our technicians would be happy to assist you.

## 1.1 Scope of delivery

- TC24IO incl. antenna
- Cable for power supply
- Operating instructions

## 1.2 General information

Read the device operating manual before initial operation. **Please pay particular attention to Chapter 2 „General Safety Notes“.**

This manual should make it easier for the operator to get used to the device and of its intended application possibilities. The operating instructions include important information related to the safe and proper operation of the device. Compliance with these instructions helps you to:

- Avoid dangers
- Avoid repair costs and downtimes
- Increase the reliability and the lifespan of the product.

This manual must be read and applied by every person who is assigned to conduct work using this device.

In addition to this operating instructions the applicable regulations on accident prevention and environmental protection should be observed.



**NOTE**

After reading, keep the operating instructions in a place accessible to every operator. If you have any further questions, please feel free to contact us.

**1.3 Signs and symbols used**

The following signs and symbols will be used in this manual, or on the product:

Symbol	Explanation
	Read this operating manual
	do not dispose of with household waste
	EU conformity marking
	Registered trademark
	use only indoors
	Protection class II
	Intrinsically safe transformer
	Direct current
	Universal Recycling Symbol

## 1.4 Structure of the warnings

The warnings are structured as follows:



### **DANGER**

Indicates an immediate dangerous situation that can lead to serious or even deadly injuries and/or that could seriously damage or even destroy the device.



### **WARNING**

Indicates a potentially dangerous situation that can lead to serious injuries and/or damage to the device.



### **NOTE**

Important and useful information on using this device.

## 1.5 Technical terms and abbreviations used

<b>Abbreviation</b>	<b>Meaning</b>
°C	Degrees Celsius, temperature
AC	Alternate current
DC	Direct current
Hz	Hertz, Frequency
Li-Ion	Lithium-ion, battery technology
mNN	Meters above sea level, height
SN	Serial number
V	Volts, electrical voltage
W	Watts, electrical power

## 1.6 Intended use

This device was designed to operate battery operated screwdrivers and riveting tools and to incorporate them, if applicable, into a higher-level system.

The device may only be used for this purpose as described in this manual. Only materials that are suitable for this type of tool may be used.



### **WARNING**

Intended use also includes

- following all indications of the operating instructions and
- observance of inspection and maintenance works.

Any other use or use beyond that is considered improper use. HS-Technik GmbH is not liable for any damage resulting from this.

## 1.7 Improper use



### **DANGER**

The use of this device for other purposes is not permitted. Improper use or incorrect accessories can lead to dangers with unforeseeable consequences.

**We accept no liability for damage and malfunctions resulting from non-observance of these operating instructions and improper use.**

## 1.8 Duties of the operator

The operator committed to only allow people who are familiar with the basic regulations on work safety and accident prevention and who have been trained on how to use the device at the workplace and to work with this device.

The safety awareness of the personnel while working will be reviewed at regular intervals.

## **1.9 Duties of personnel**

Prior to its use all people who work with this device are obligated to inform themselves of the applicable workplace safety and accident prevention regulations for this device and to observe them.

## **1.10 Training of personnel**

Only trained and instructed personnel should work with this device. The responsibilities of the personnel must be clearly defined. Trainees may only work with this device under the supervision of an experienced person.

## **1.11 Guarantee and liability**

Guarantee and liability claims for personal injury and property damage are excluded, if caused by one or more of the following:

- improper use
- failure to observe these operating instructions
- improper installation, commissioning, operation and maintenance of the device
- Operating the device with defective safety devices or improperly installed, or non-functioning safety and protective devices
- Failure to observe the information in the operating instructions regarding transport, storage, assembly, commissioning, operation and maintenance of the device
- unauthorised structural modifications to the device
- improperly performed repairs
- catastrophes due to external influences and acts of God

## 1.12 Copyright

These operating instructions are intended solely for the operator and its personnel.

They contain guidelines and information which may not be fully, or partially

- reproduced
- distributed or
- otherwise shared.

The copyright of these operating instructions is retained by HS-Technik GmbH.

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## 2 Basic safety instructions

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### **DANGER**

Read all the safety information, instructions, illustrations and technical data which is provided with this device. Failure to follow the instructions below may result in electric shock, fire and/or serious injury.



### **WARNING**

This device was manufactured in accordance with current state-of-the-art technology and recognised technological safety guidelines. However, its use may jeopardise the health and life of the user or third parties, or risk damage to other property.



### **WARNING**

The workplace must only be used in accordance with its intended use and in technically perfect condition.



### **NOTE**

Keep all safety information and instructions for the future.

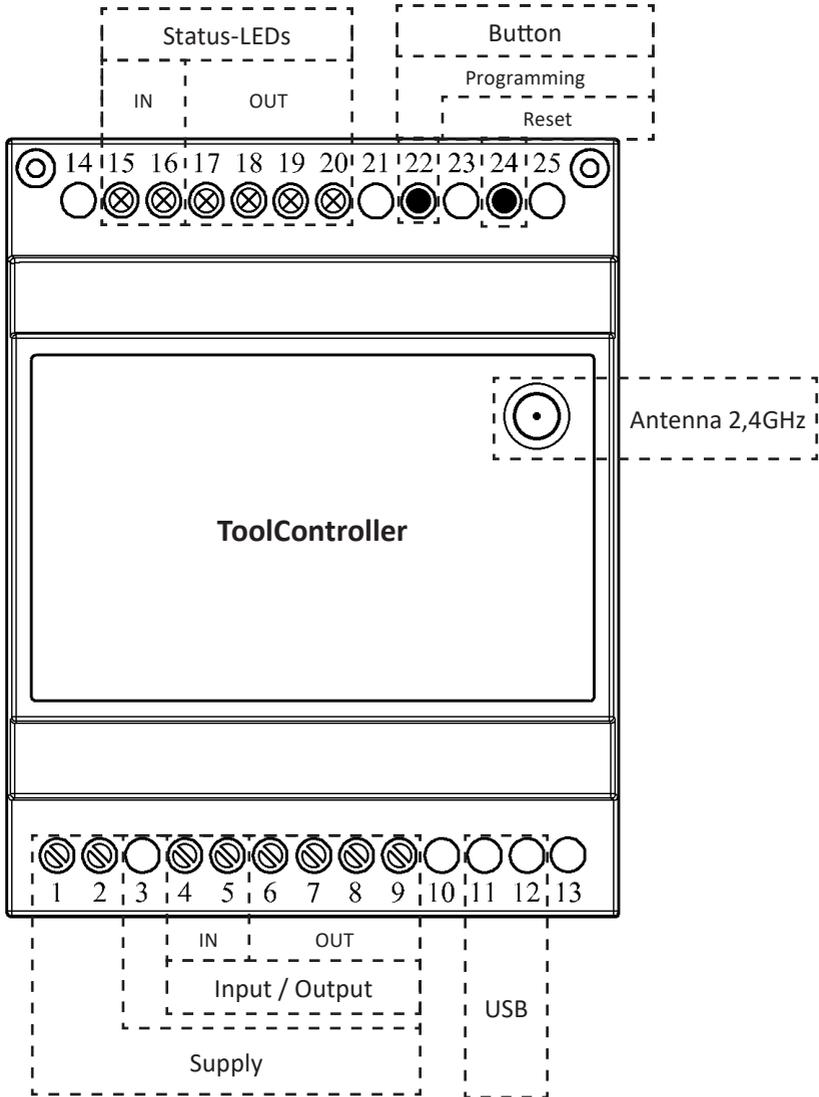


### **NOTE**

**Only have your device repaired by qualified professional staff and only with original replacement parts which are available at HS Technik GmbH.** This ensures that the safety of the device is maintained.

### 3 Overview

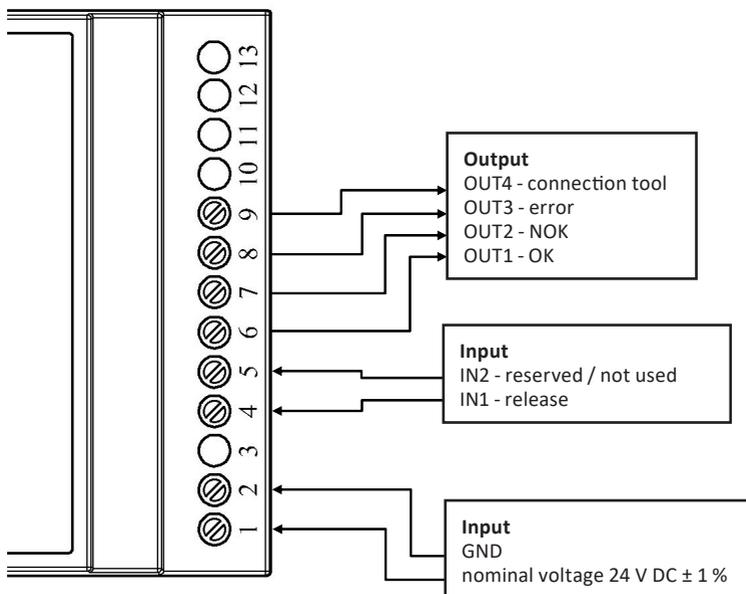
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## 4 Commissioning

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Nr.	Description	Values	Function/Comment
1	Supply	+24V DC $\pm$ 1%	
2	Supply	GND	
4	Input 1	OV / 24V	Release
5	Input 2	OV / 24V	Reserved/no function; connection after GND or leave empty
6	Output 1	OV / 24V	OK
7	Output 2	OV / 24V	NOK
8	Output 3	OV / 24V	error
9	Output 4	OV / 24V	Connection tool
11 & 12	Mini USB port		
15	Status LED, input 1	Status input 1	Release
16	Status LED, input 2	Status input 2	
17	Status LED, output 1	OK indicator	
18	Status LED, output 2	NOK indicator	
19	Status LED, output 3	Error indicator	
20	Status LED, output 4	Connection tool indicator	
22	Program button	Programming; restore tool settings	Hold for 10 sec. to restore factory default settings
24	Reset button	Reset	
	Antenna connection port	2,4 GHz	SMA connection



### Input

Signal	State	Voltage range
	High	$5\text{ V} \leq U_{\text{high}} \leq 24\text{ V}$
	Undefined	$0,8\text{ V} \leq U_{\text{undef}} \leq 5\text{ V}$
	Low	$0\text{ V} \leq U_{\text{low}} \leq 0,8\text{ V}$

### Output

Signal	State	Voltage range
	High	$U_{\text{high}} = 24\text{ V}$
	Low	$U_{\text{low}} = 0\text{ V} = \text{GND}$

## 5 Notes

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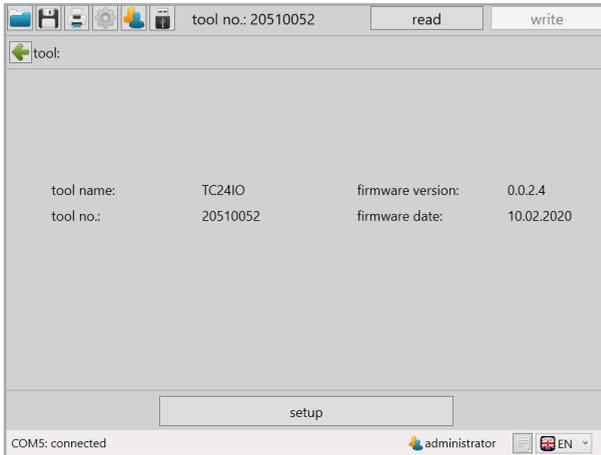
- Parameterization via USB is not permitted during operation. When reading out via USB, a reset of the TC24IO is carried out.
- If the battery of the tool is disconnected after connecting, the connection status will not be updated. Output „OUT4“ remains high. The connection status is updated by the TC24IO when a telegram is sent again.
- Error status „OUT3“ is set when telegrams to the tool are not answered with „OK“, e. g. at the hardware initialization (PowerRiv). Here, the TC24IO Enable telegram is answered with „HW“.

# 6 Setup TC24IO

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## 6.1 Connecting to the HST-Tool-Manager

- Connect mini USB to Laptop/PC
- Start HST Tool Manager
- To start the readout, press the „Read“ button
- Open the settings menu by pressing the „Settings“ button



## 6.2 Network settings

- Define SSID and network key
- Set IP address of the TCs with port number
- Set up subnet mask
- A standard gateway is not required → everything is „0“
- Save changes in the TC by pressing the „Apply changes“ button

The screenshot shows a web-based configuration interface for a device. At the top, it displays 'tool no.: 19060010' and two buttons: 'read' and 'write'. Below this is a navigation bar with tabs: 'network settings' (selected), 'task management', 'webinterface', 'test I/O', and 'tool status'. The main content area is titled 'tool: setup:' and contains the following settings:

- Soft-AP
  - SSID: HST-TC24IO
  - network key: 12345678910
  - channel: 12
  - network protocol: TCP
- DHCP
  - own IP-address: 192 | 168 | 1 | 1 port: 8001
  - subnet mask: 255 | 255 | 255 | 0
  - default gateway: 0 | 0 | 0 | 0
  - apply changes

At the bottom left, it says 'COM5: connected'. At the bottom right, it shows the user 'administrator' and a language dropdown menu set to 'EN'.

## 6.2.1 Network settings for integration into an existing Wi-Fi network

It is possible to integrate the TC24IO into an existing Wi-Fi in order to communicate with the tool. This means that an existing infrastructure can be used.

To use this option, proceed as follows:

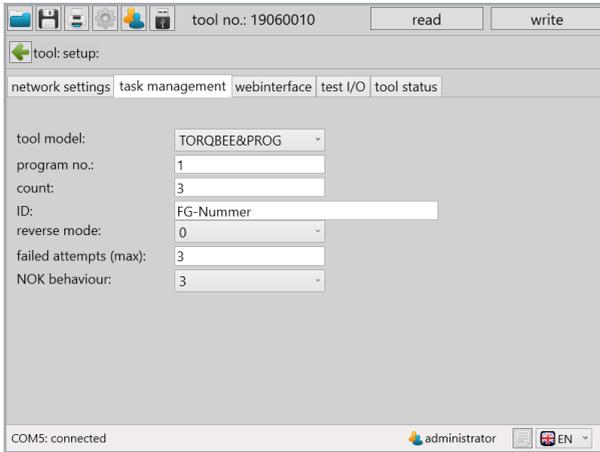
- Uncheck „**Soft-AP**“
- Enter the **SSID** of the WLAN network\* to be used
- Enter the **network key** of the Wi-Fi network \* to be used
- Select the appropriate **channel**
- Specify the IP address of the TC with the port number  
The IP range used by the TC24IO and the tool can also be different from the IP range of the Wi-Fi network; it must then be ensured that a correct **subnet mask** is entered.
- Set the **standard gateway** (IP address of the access point)
- Save changes in TC with the „**Apply changes**“ button

\*Please note that the TC24IO only supports 2.4GHz Wi-Fi. Integration into a 5GHz Wi-Fi is not possible.

## 6.3 Process controls

- Select the **Process controls** tab
- **Select** tool type
- **Program no.:** Select program with which the tool should work. To start a process, „101“ must be selected for the PowerRiv and NutBee series riveting tools. For screwdriving tools of the TorqBee series, the number of the desired sequence + 1000 must be selected e.g. if process number 3 is to be released, „1003“ must be entered.
- **Count:** Number of screw connection/rivets per release
- **ID:** Entry mandatory (e.g. „1“), entry as customized text, max. 64 characters, no special characters like semicolon or space.
- **TorqBee release mode:**  
0 = never, 1 = only after NOK, 2 = after OK/NOK, 4 = released up to 1st OK
- **NutBee release mode:** 0 = never
- **Failed attempts max.:** customized entry of the max. permitted repeat attempts
- **NOK behavior:**  
0 = NOK results in immediate stop, 1 = 1 x NOK results in NOK, 2 = screw NOK → NOK screws does not result in total NOK within the attempts, 3=never NOK

The screenshot shows a software interface for tool setup. At the top, there is a toolbar with icons for home, save, print, settings, help, and a power button. Below the toolbar, the text "tool no.: 19060010" is displayed next to "read" and "write" buttons. The main area is titled "tool: setup:" and contains a navigation bar with tabs: "network settings", "task management", "webinterface", "test I/O", and "tool status". The "tool status" tab is active. Below the navigation bar, there are four configuration fields: "tool model:" with a dropdown menu showing "POWERRIV", "program no.:" with a text input field containing "1", "count:" with a text input field containing "3", and "ID:" with a text input field containing "FG-Nummer". At the bottom of the window, the status bar shows "COM5: connected", the user "administrator", and a language dropdown menu set to "EN".



### Release mode

Value	Designation	Description
0	Never	Not possible to release
1	NOK	Release only possible after NOK
2	OK & NOK	Release after OK and NOK possible
3	Off program	Settings correspond to the program of the tool (selection only possible via web interface)
4	1.OK	Release until 1.OK possible

### NOK-behaviour

Value	Designation	Description
0	1 x NOK → Cancel	Cancel as soon as NOK
1	1 x NOK → NIO	Once NOK leads to total NOK
2	1 x SC NOK → NIO	A screw NOK leads total NOK
3	Never NOK	NOK NEVER leads to NOK (always OK)

## 6.4 Webinterface

- **Set login name and password**
- By default, the login name and password are always set to „admin“
- **Set desired auto logout time**

tool no.: 19060010    read    write

tool: setup:

network settings | task management | **webinterface** | test I/O | tool status

webinterface

login name:    admin

login password:    admin

auto logout time:    60 [s]

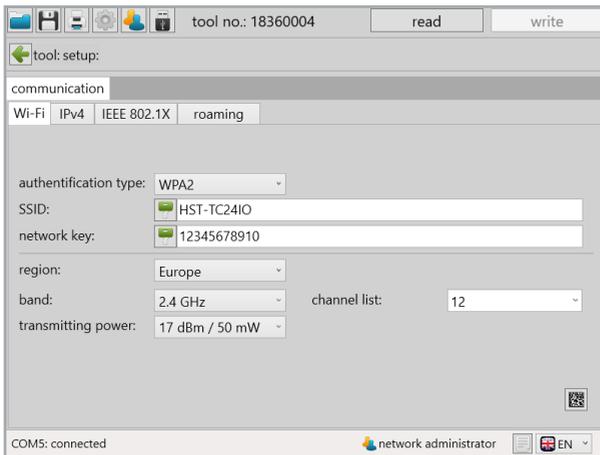
apply changes

COM5: connected    administrator    EN

# 7 Tool configuration

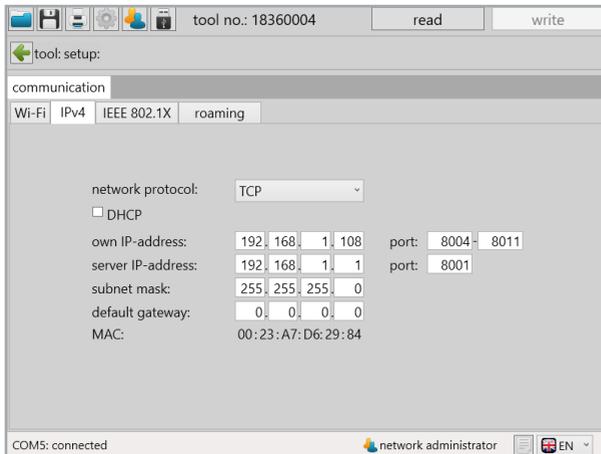
## 7.1 Wi-Fi

- Log in to the HST Tool Manager as network administrator (password can be obtained from your HS Technik agent)
- Read out tool
- Select the Communication tab after pressing the „**Settings**“ button
- Modify the following settings on the **Wi-Fi** tab
  - **Type of authentication:** WPA / WPA2
  - **SSID:** Apply settings from the TC24IO
  - **Network key:** Apply settings from the TC24IO
  - **Region:** automatic
  - **Band:** Select 2.4 GHz
  - **Transmission power:** select according to the desired range
  - **Channel:** Apply settings from the TC24IO



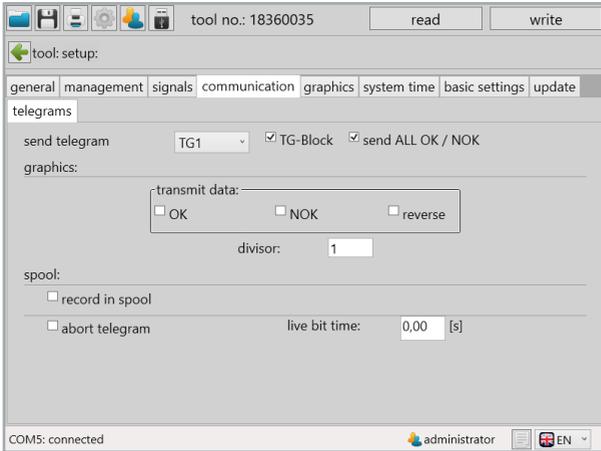
## 7.2 Ipv4

- Switch to the **IPv4** tab
- Apply settings for the **server IP address, port (lower) and subnet mask** from the tool controller
- Adapt own **IP address and port range** to the TC



### 7.3 Telegrams

- Switch to tab telegrams
- Next to send telegram select TG1
- TG-Block-PR must be activated
- Send ALL OK / NOK must be activated

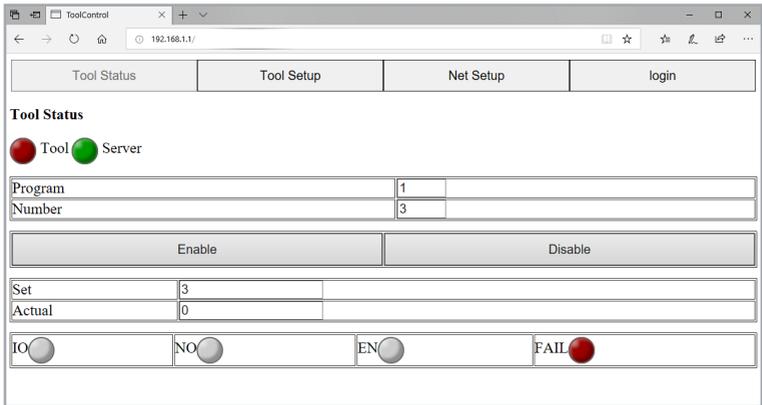


8 Configuration telegrams

# 8 Web interface

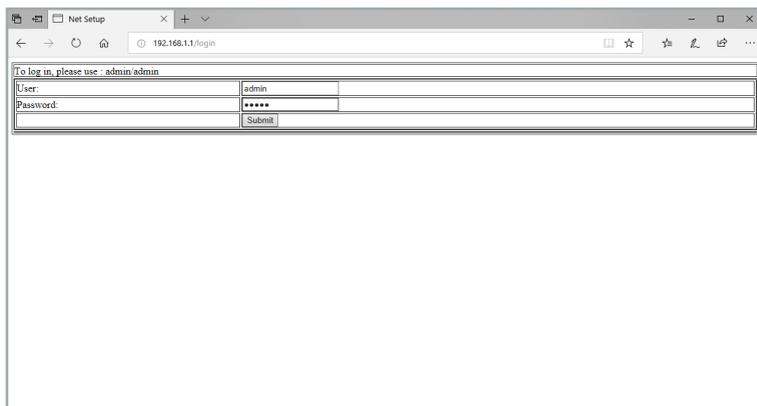
## 8.1 Tool status

- Connect PC, tablet, smartphone to the Wi-Fi (SSID/network key) defined in the TC
- Open browser and query the TC's IP address
- Color-coded indicators under „**Tool status**“ show the TC's server status and the connection to the tool (Red – Inactive/not connected; Green – active/connected)
- **Program** displays the program set for the tool
- **Quantity** displays the frequency of the program repetitions per release
- The tool can be released/blocked using the „**Enable**“ and „**Disable**“ buttons



## 8.2 Login

- On the login tab, users can log in to the web interface via the defined user settings.
- Default settings: User: admin, Password: admin

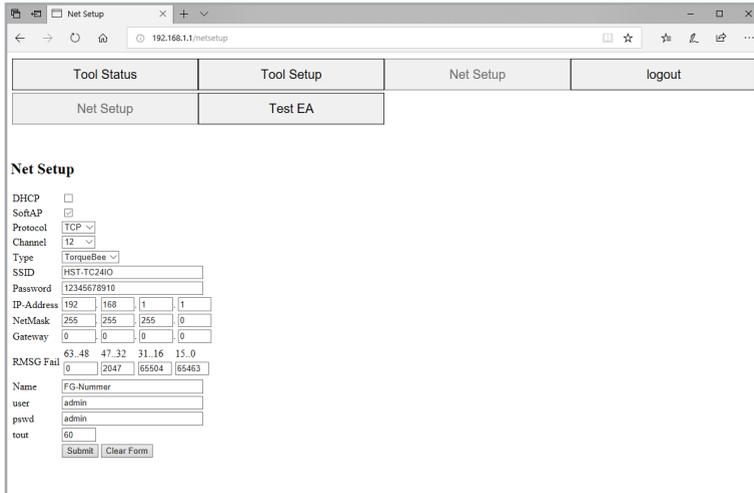


The screenshot shows a web browser window titled "Net Setup" with the address bar displaying "192.168.1.1/login". The page content includes a header instruction: "To log in, please use : admin/admin". Below this, there is a login form with two input fields: "User:" containing the text "admin" and "Password:" containing six asterisks. A "Submit" button is located to the right of the password field.

To log in, please use : admin/admin	
User:	admin
Password:	*****
	Submit

## 8.3 Net setup

- Several TC settings can be viewed/modified here



The screenshot shows a web browser window titled "Net Setup" with the address bar displaying "192.168.1.1/netsetup". The page has a navigation menu with four tabs: "Tool Status", "Tool Setup", "Net Setup", and "logout". The "Net Setup" tab is active, and below it, there are two sub-tabs: "Net Setup" and "Test EA".

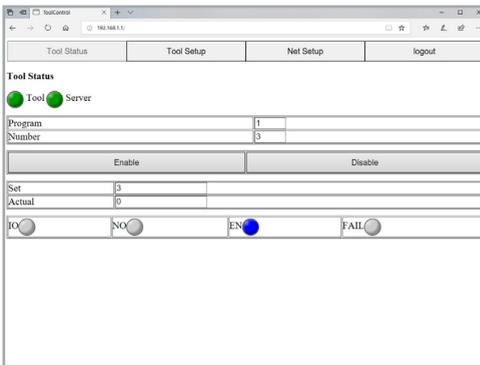
The main content area is titled "Net Setup" and contains the following configuration options:

- DHCP:
- SoRAP:
- Protocol: TCP (dropdown)
- Channel: 12 (dropdown)
- Type: TorqueBee (dropdown)
- SSID: HST-TC240
- Password: 12345678910
- IP-Address: 192.168.1.1
- NetMaak: 255.255.255.0
- Gateway: 0.0.0.0
- RMSG Fail: 63.48 47.32 31.16 15.0
- FG-Number: 0
- Name: admin
- user: admin
- pswd: admin
- tout: 60

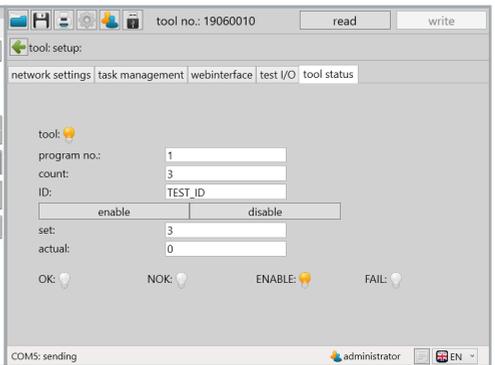
At the bottom of the form, there are two buttons: "Submit" and "Clear Form".

## 8.4 Connection- and functiontest

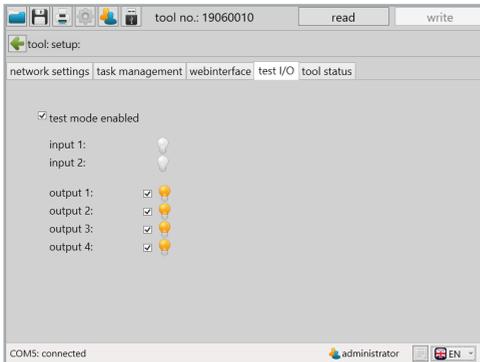
- Connect PC/mobile device to TC24IO via Wi-Fi
- Read out using the ToolManager and change under Settings in the ToolStatus tab
- Connect PC/mobile device to TC24IO via Wi-Fi
- Call up the webinterface tab Net Setup and change to tab Test EA
- Activate test mode via boxes and switch outputs
- Check the status LEDs on the TC24IO and TM
- Call Alternative Rider Test EAs in TM and with Web Interface



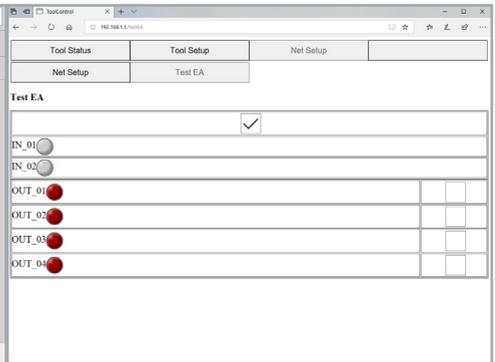
Web interface Tool Status



Tool Status



Test EAs



Web interface Test EA

## 9 Technical data

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### General information

Property	Description	Function/comment
Dimensions (L × W × H)	91 × 72 × 62 mm	
Weight	200 g	
Fastening	DIN-profile rail, 35 mm	EN 50022
Protection category	IP20	
Protection class	3	Protective low voltage
Operating temperature	0°C ≤ T ≤ 55°C	
Relative humidity	20 % ≤ ϕ ≤ 60 %	
Transport and storage	-20°C ≤ T ≤ 60°C 0% ≤ ϕ ≤ 75%	

### Electrical properties

Property	Description	Function/comment
Power supply	24 V DC ± 1 %	Power supply
Service	max. 24 W	
Voltage inputs	0 - 24V	see chapter 4
Voltage outputs	0 / 24V	see chapter 4
Current outputs	max. 100 mA	Per output

## 10 EC declaration of conformity

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We herewith declare that the device specified below comply with the essential safety requirements of the specified EU directives.

The proper intended use of the device and compliance with the installation and commissioning instructions is a prerequisite for this.

If the device or its accessories/attachments are modified without our authorization, this declaration will be null and void.

<b>Description of the device:</b>	<b>Controller</b>
<b>Type description:</b>	TC24IO
<b>Manufacturer:</b>	HS-Technik GmbH Im Martelacker 12 D-79588 Efringen-Kirchen
<b>Directives:</b>	2014/30/EU 2014/35/EU 2011/65/EG 2001/95/EG
<b>Angewandte Normen:</b>	EN 55032:2015 EN 61000-4-2:2009 EN 61000-4-3:2006 + A1:2008 + A2:2010 EN 61000-4-4:2012 EN 61000-4-6:2014 EN 61000-4-8:2010 EN 61000-6-2:2005+AC :2005-09 EN 61000-6-3:2007 + A1:2011/AC2012 EN 301 489-1 V2.1.1 (2017-02) EN 301 489-17 V3.1.1 (2017-02)

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