
# WAVE TTA

User Manual

Weidmüller

# Foreword

## Revision history

| Version | Date | Change |
|---|---|---|
| 0.0 | 04/08 | First edition |

## Contact address

Weidmüller Interface GmbH & Co. KG
Postfach 3030
32720 Detmold
Klingenbergstraße 16
32758 Detmold
Germany
Phone +49 (0) 5231 14-0
Fax +49 (0) 5231 14-2083
E-Mail info@weidmueller.com
Internet www.weidmueller.com

# Contents

**Foreword** ..... 3
Revision history ..... 3
Contact address ..... 3

**Contents** ..... 4

**1. Approvals** ..... 7
1.1 CE ..... 8
1.2 UL ..... 8
1.3 GL ..... 8

**2. Warrantee statement** ..... 9
2.1 36 months warranty ..... 10

**3. Notes on Safety** ..... 11
3.1 Electrical precautions ..... 12
3.2 Handling ..... 12

**4. Introduction** ..... 13
4.1 Symbol identification ..... 14
4.2 Types / article numbers ..... 14
4.3 General description / applications / examples ..... 14

**5. Operation** ..... 17
5.1 Status & alarm LEDs ..... 18
5.2 Functional block diagram ..... 19
5.3 Specifications ..... 20

**6. Installation** ..... 23
6.1 General (Competence Warning) ..... 24
6.2 Mounting / Environmental / EMI protection / warm up ..... 24
6.3 Marking ..... 25
6.4 Electrical Connections ..... 25
6.5 Connection diagram ..... 26

**7. Setup / Configuration ..... 29**

7.1 Default setting ..... 30

7.2 CBX100USB introduction ..... 30

7.3 Configuration / diagram wiring ..... 30

**8. TTA-Set software ..... 31**

8.1 Description ..... 32

8.2 Installation ..... 32

8.3 Starting/exiting TTA-Set ..... 32

8.4 Title bar ..... 32

8.5 Overview parameters ..... 34

8.6 Run mode ..... 41

8.7 Product identification ..... 41

8.8 Updates ..... 42

**9. Testing the product ..... 43**

9.1 Test procedure ..... 44

**10. Troubleshooting ..... 47**

10.1 Troubleshooting ..... 48

**Appendix ..... 49**

Appendix A: Article Overview ..... 50

Index ..... 51

# 1. Approvals

1.1 CE....8
1.2 UL....8
1.3 GL....8

## 1.1 CE

CE Declaration is available from Weidmüller.

## 1.2 UL

Listing approval (cULus) is pending.

## 1.3 GL

Germanischen Lloyd approval is pending.

# 2. Warrantee statement

**2.1 36 months warranty .....10**

## 2.1 36 months warranty

Weidmüller gives a 36 months warranty on the Wave TTA product in accordance with the warranty terms as described in the general conditions of sale of the Weidmüller company which has sold the products to you.

Weidmüller warrants to you that such products the defects of which have already existed at the time when the risk passed will be repaired by Weidmüller free of charge or that Weidmüller will provide a new, functionally equivalent product to replace the defective one.

The warranty referred to above covers Weidmüller products. Safe where expressively described otherwise in writing in this catalogue/product description, Weidmüller gives no warranty or guarantee as to the interoperability in specific systems or as to the fitness for any particular purpose. To the extent permitted by law, any claims for damages and reimbursement of expenses, based on whatever legal reason, including contract or tort, shall be excluded. Where not expressively stated otherwise in this warranty, the general conditions of purchase and the expressive liability commitments therein of the respective Weidmüller company which has sold the products to you shall be applicable

# 3. Notes on Safety

**3.1 Electrical precautions ..... 12**
**3.2 Handling ..... 12**

## 3.1 Electrical precautions

| | |
|---|---|
|  | **DANGER!**<br>This product may be connected to potentially lethal voltages! |

| | |
|---|---|
|  | **WARNING!**<br>• Before you remove or mount the unit, turn-off the power supplies – i.e. to the instrument and to the relays, if used.<br>• Product electronics must not be removed from its enclosure without disconnecting power sources.<br>• Follow ESD installation regulations, including the EMI precautions given in chapter 6. |

## 3.2 Handling

Check on receipt that the product received corresponds to the one ordered.

Also check that a CD (which includes the User Manual and configuration software) has been supplied in the carton.

Unpack the product carefully, and ensure the CD/User Manual is kept with the product until it is permanently mounted.

There are no procedures which involve the user removing the product electronics from its housing.

Set-up or Re-configuration (see chapter 7) is via a connector located behind the front flap, which is released by small screwdriver (see Figure 1).

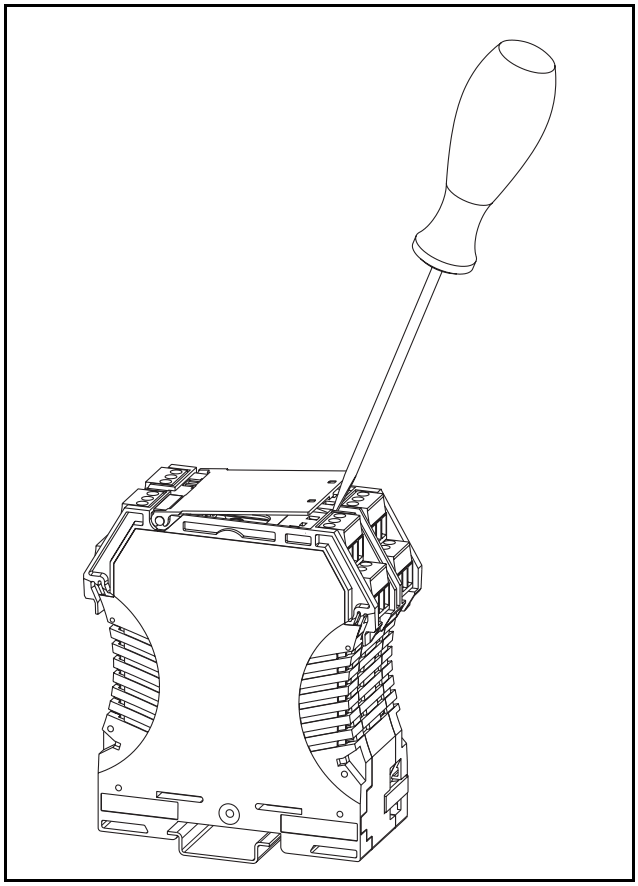


Figure 1 Handling

# 4. Introduction

**4.1 Symbol identification ..... 14**
**4.2 Types / article numbers ..... 14**
**4.3 General description / applications / examples ..... 14**

## 4.1 Symbol identification

**DANGER!**

Potentially lethal voltages.

CE The CE mark proves the compliance of the product with the requirements of the directives.

## 4.2 Types / article numbers

This User Manual covers the following product types / article numbers

| | |
|---|---|
| WAS6 TTA | 8939670000 |
| WAZ6 TTA | 8939680000 |
| CBX100 USB | 7940025031 |

The only difference between the products is the connection type. The WAS6 TTA has screw connectors and the WAVZ6 TTA has tension clamp connectors.

## 4.3 General description / applications / examples

Wave TTA is an accurate and stable signal converter / isolator / alarm generator for use in measurement and control systems. In one model, a wide variety of input / output range and type settings can be configured, using a separate (CBX100 USB) interface and (TTA SET) software. The TTA can be powered from DC or AC sources between 18 and 264 volts.

The primary characteristic of the Wave TTA is its versatility of input / output configurability. Hence many of the standard functions performed by DIN rail mounted conditioners can be done by the TTA, such as

- Conversion (current to voltage, and vice versa)
- Isolation of temperature sensor and DC inputs
- Linearization of temperature sensor inputs
- Transmission of sensor signals over long distance
- Characterising signals from DC transmitters
- Process alarm generation
- Relay control between high and low values

can be done by the TTA.

### Typical Applications

Typical of applications for the TTA is the conversion of thermocouple temperature input (low range of millivolts) into a high level (e.g. 4-20 mA) value for transmission to a control system.

In this type of installation the TTA provides:

- Linearization of the standard thermocouple temperature/millivolts characteristic.
- Isolation of the input signal to the control system. This allows the user to use a thermocouple with a grounded hot junction for a quick response at the measurement point. This would otherwise convey electromagnetic influences (humming) into the control system.
- Selectable output value for a thermocouple-break event.
- Flashing LED status indicator on the unit front on thermocouple-break.
- Relay alarm output if required on thermocouple-break.
- Relay alarm output on high or low process temperature.

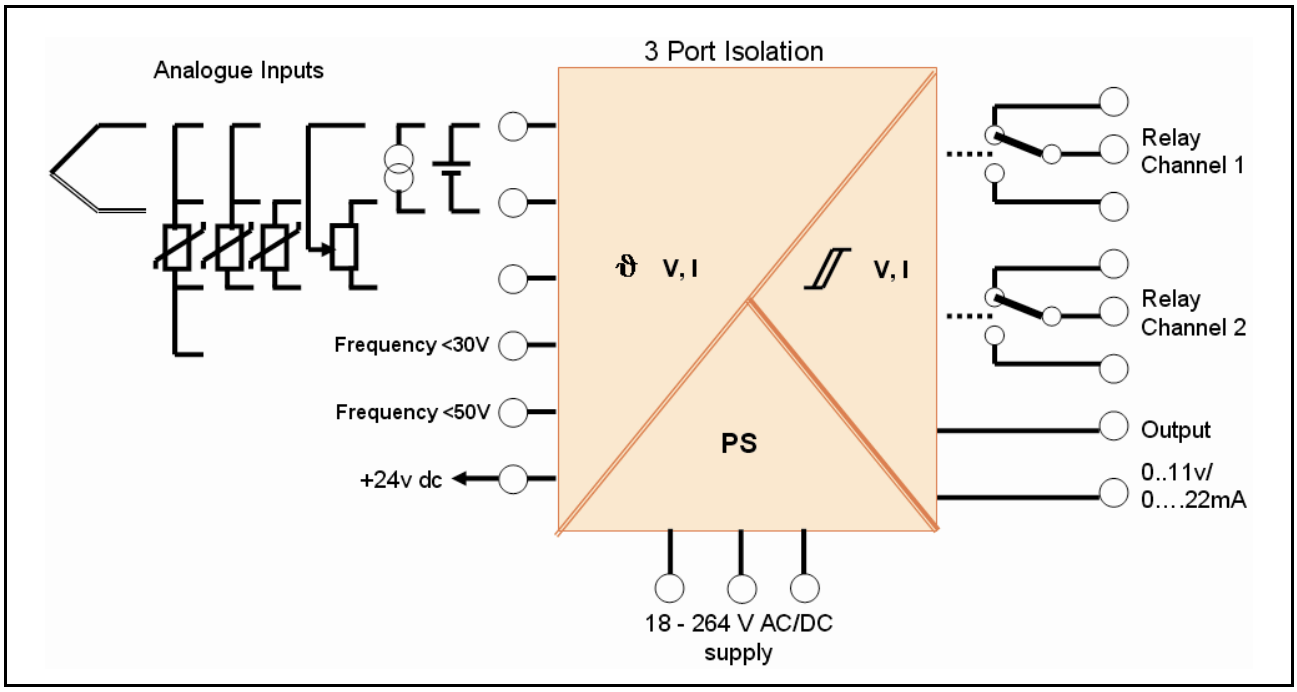



Figure 2 Installation overview

# 5. Operation

**5.1 Status & alarm LEDs ..... 18**
**5.2 Functional block diagram ..... 19**
**5.3 Specifications ..... 20**

## 5.1 Status & alarm LEDs

### Status LED

Under normal conditions this (green) LED is on continuously.

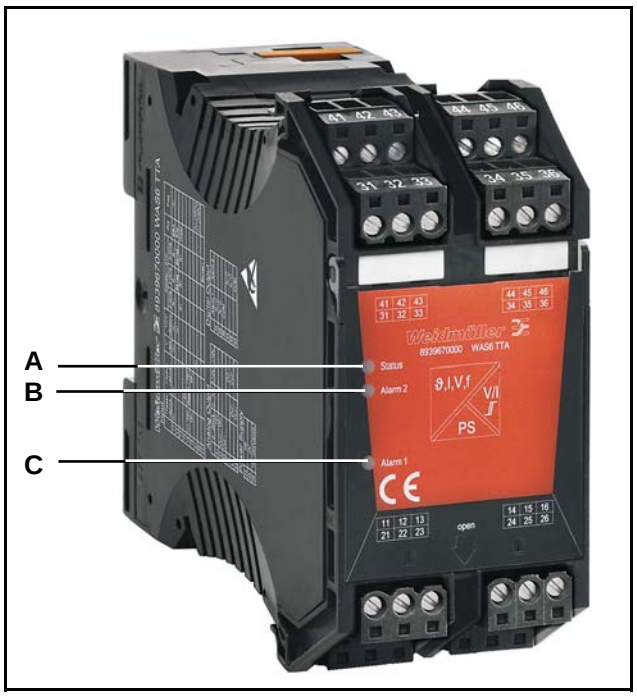



Figure 3 LEDs

**A** Status LED

**B** ALARM 2

**C** ALARM 1

The following table shows how alarm conditions are displayed.

| Status indicator | Alarm conditions |
|---|---|
| Normal status | continuously on |
| Input open circuit | flashes at 0.5 Hz |
| Input short circuit | flashes at 5 Hz |
| Cold Junction error | 2 pulses, rests, 2 pulses |
| Flash memory error | 3 pulses, rests, 3 pulses |

Table 1 Status indicators

### Analogue Output status with alarm

- User may select output value under fault conditions
- Output compliant with NAMUR recommendations (NE43) can be set (<3.6 mA or >21 mA)

### Input fault detection

Input faults such as short circuit or open circuit can be detected for most input types. These are shown in the table below.

| Input type | Detection | |
|---|---|---|
| | Open circuit | Short circuit |
| Thermocouple | Yes | Yes |
| RTD | Yes | Yes |
| Millivolts | Yes | No |
| Volts (Positive) | Yes | No |
| Milliamps (Passive) | Yes* | No |
| Milliamps (Active) | Yes | Yes |
| Resistance | Yes | Yes |
| Potentiometer | Yes | Yes** |

Table 2 Input fault detection

* Open circuit not detected for live zero ranges

** Short circuit for end-to-end

## 5.2 Functional block diagram

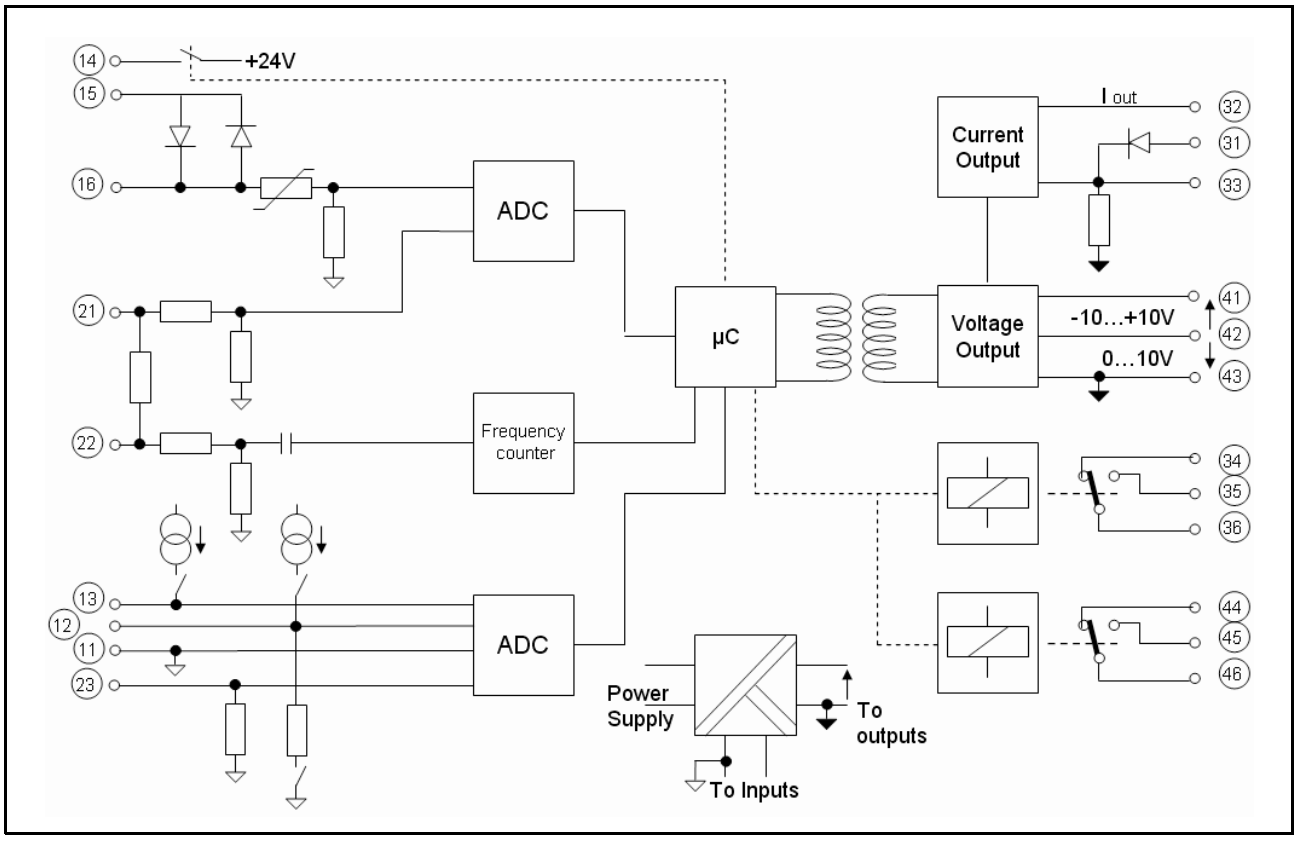



Figure 4 Functional block diagram

## 5.3 Specifications

| | |
|---|---|
| **Input types** | |
| Thermocouple | Range -200...+1820 °C<br>Types B, E, J, K , L, N, R, S, T to IEC 60584 plus custom specific |
| RTD | 2, 3, 4 wire, within the range -200...+850 °C, for Pt100, Pt1000 to IEC 60571 and for Ni100 / Ni1000 to DIN 43760, for Cu10 and,100 plus custom specific |
| Potentiometer | 10 Ω...100 kΩ |
| Resistance | 10 Ω...5 kΩ |
| Frequency | 2 Hz...100 kHz |
| Voltage | within the range -200...600 mV (min span 4 mV),<br>within the range -20...50 V DC (min span 0.5 V) |
| Current | within the range -20...50 mA (min span 1 mA) |
| Current Loop supply | +24 V DC |
| Sensor break output | Selectable between -2% and 102% output |
| **Analogue Output** | |
| DC voltage | 0...5, 1...5, 0...10, 2...10 V or span-settable between -10...10 V (min span 2.5 V) |
| DC current | 0...20, 4...20, 0...10 mA, or span-settable between 0...20 mA (min span 5 mA) |
| Max load (current / voltage) | 700 Ω / >10 kΩ (>20 kΩ for -10 V…+10 V) |
| Action | Direct or Reverse Acting |
| **Digital Output** | |
| Relays | 2 x SPCO |
| Max voltage | 250 V AC |
| Max current | 3 A |
| **General Data** | |
| Supply voltage | 18...264 V AC/DC |
| Rated power | < 3,5 W |
| Ambient operating range | -40...+70 °C |
| Isolation test | 2.5 kV / 1 min |
| Rated voltage | 300 V |

| **Performance** | |
|---|---|
| Accuracy | DC, RTD inputs <0.1% span.<br>Thermocouple inputs: 0.2% span (or 1 °C) + CJ error |
| Ambient temp effects | DC & RTD inputs < 0.01%/K<br>Thermocouple inputs < 0.01% of full scale/K + CJ error 0.07 °C/K |
| Step Response/<br>Cut-off Frequency | Settable within 60 ms -1880 ms / 1 Hz (3 dB) |
| **Physical** | |
| Dimensions | 92.4 x 112.5 x 45 mm |
| No. of connections | 12 |
| Connection types | screw or tension clamp |
| Housing material | UL 94 V0 |
| Housing colour | Black |
| Ingress protection | IP20 |
| Approvals | CE, cULus*, C1D2*, Zone 2 ATEX*, NEPSI* (*=pending) |
| **Type** | **Order No.** |
| WAS6 TTA | 8939670000 (screw connectors) |
| WAZ6 TTA | 8939680000 (tension clamp connectors) |

Table 3 Specifications

# 6. Installation


**6.1 General (Competence Warning) ..... 24**

**6.2 Mounting / Environmental / EMI protection / warm up ..... 24**

**6.3 Marking ..... 25**

**6.4 Electrical Connections ..... 25**

**6.5 Connection diagram ..... 26**

## 6.1 General (Competence Warning)

Wave TTA instruments should only be installed by technically qualified personnel with sufficient qualification or knowledge in the subject of instrumentation and control engineering. Qualified personnel are defined as persons considered in 0105 Part 1 / DIN EN 50110-1 as electrically skilled workers or electronically instructed personnel, or similar local standards.

## 6.2 Mounting / Environmental / EMI protection / warm up

### Mounting

Wave TTA is designed to be mounted onto a TS35 DIN rail.

It clips onto the rail via a spring-loaded mounting foot, and can be removed via a spring release on the edge of the product near the mounting rail.

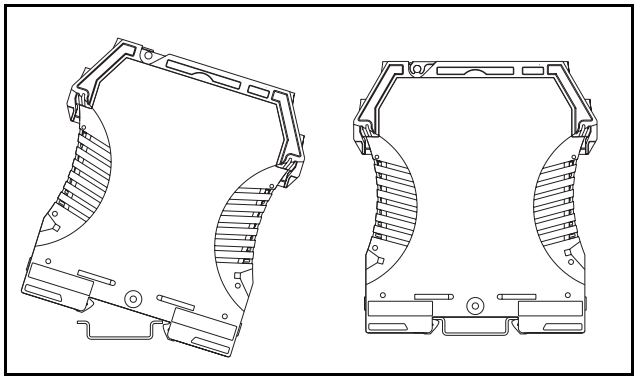


Figure 5 Mounting on DIN rail

### Environment

Wave TTA is designed for use either indoors (IP20) in a control panel, or in a weather-proof field enclosure. Its atmosphere should be dry, well ventilated and dust-free.

Avoid mounting in locations subject to vibration or physical impact.

### EMI protection

Do not install input, output and power supply cables close to sources of electrical interference. For example, such sources could include relays, contactors, motors and their controls, including thyristor drives, and the cables which connect these devices. Avoid installing TTA cables in the same ducting as such cables.

Local electrical installation practices should be followed.

### Warm-up

The product is designed to function as soon as power is supplied. However a warm-up period of 15 minutes is required before it performs to the specifications above.

**NOTE**

When auxiliary power is switched on, for the first 200 ms the TTA will consume up to 200 mA.

## 6.3 Marking

Two markers are located below the top sets of terminals for costumer identification.

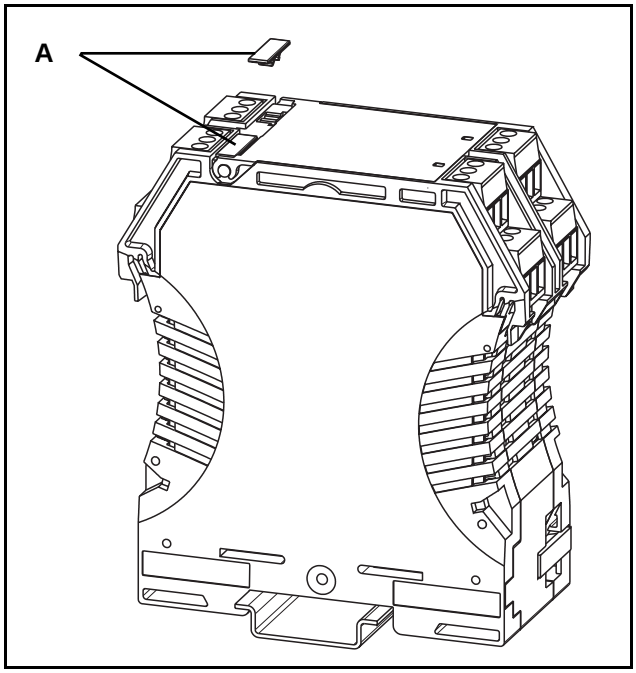



Figure 6 Module marker

**A** Markers

Article number:
1609880000 WS 15/5 MC NEUTRAL PU 480

## 6.4 Electrical Connections

Input, output and power supply wiring is made via numbered, pluggable connectors, which may be screw clamp or tension clamp type, depending on the item article number.

The connectors are coded to prevent the power supply connector being fitted in the wrong position.

Test terminals are included to permit input and output currents to be monitored without disconnection of cables (see connection diagram below).

| | NOTE |
|---|---|
| | Ensure that the connectors are inserted into the correct position **(see connection diagram)**. |

## 6.5 Connection diagram

The connection diagram below is printed on the side of the TTA housing.

**Connection diagram – Power supply**

| Term. No. | |
|---|---|
| 24 | 0 V |
| 26 | 18 - 264 V DC / AC |

Table 4 Power supply

**Connection diagram – Input**

| Term. No. | $I_{Passive}$ <50 mA | $I_{Active}$ <20 mA | V <50 V | TC / V <600 mV | Resistor / RTD | | | Poti | Freq |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 2-Wire | 3-Wire | 4-Wire | | |
| 11 | In- | | In- | In- | R- | R- | R- | Start | In- |
| 12 | | | | In+ | | Sense- | Sense- | End | |
| 13 | | | | | R+ | R+ | R+ | Wiper | |
| 14 | | +24 V | | | | | | | |
| 15 | In+ / TP+ | $I_{Return}$ / TP+ | | | | | | | |
| 16 | TP- | TP- | | | | | | | |
| 21 | | | In+ | | | | | | In+ (<50 V) |
| 22 | | | | | | | | | In+ (<30 V) |
| 23 | | | | | | | Sense+ | | |

Table 5 Input

### Connection diagram – Analogue output

| Term. No. | 0…20 mA | 0…10 V | -10 V…+10 V |
|---|---|---|---|
| 31 | TP+ | | |
| 32 | Out+ / TP- | | |
| 33 | Out- | | |
| 41 | | | Out- |
| 42 | | Out+ | Out+ |
| 43 | | Out- | |

Table 6 Analogue output

### Connection diagram – Digital output

| Term. No. | Alarm 1 | Alarm 2 |
|---|---|---|
| 34 | N/C | |
| 35 | N/O | |
| 36 | COM | |
| 44 | | N/C |
| 45 | | N/O |
| 46 | | COM |

Table 7 Digital output

# 7. Setup / Configuration

**7.1 Default setting ..... 30**
**7.2 CBX100USB introduction ..... 30**
**7.3 Configuration / diagram wiring ..... 30**

## 7.1 Default setting

| | |
|---|---|
| **Input range** | 4-20 mA |
| ADS Speed | medium |
| Transfer function | Linear |
| Response time | 0.25 s |
| **Output range** | 4-20 mA |
| Action | direct |
| Low limit | 0 mA |
| High Limit | 20 mA |
| Output @ error | 21.5 mA |
| **Digital outputs 1 and 2** | Disabled |

Table 8 Default settings

## 7.2 CBX100USB introduction

The CBX100USB is the configuration interface for the wave TTA. This is the same interface as can be used for configuring the ITX Plus universal transmitter.

Connection to the computer is via USB port, and to the Wave TTA via a jack connector. Tx and Rx status are indicated by LEDs on the CBX100.

## 7.3 Configuration / diagram wiring

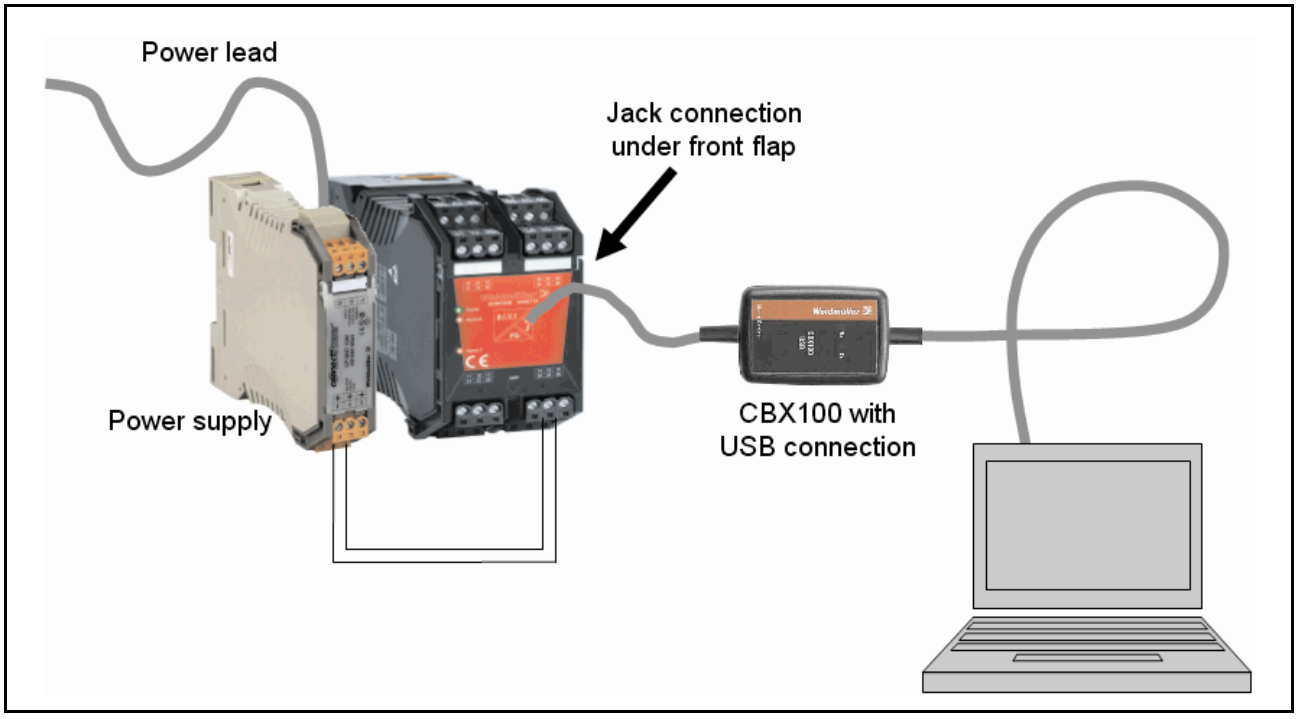



Figure 7 Configuration / diagram wiring

# 8. TTA-Set software


**8.1 Description ..... 32**
**8.2 Installation ..... 32**
**8.3 Starting/exiting TTA-Set ..... 32**
**8.4 Title bar ..... 32**
**8.5 Overview parameters ..... 34**
**8.6 Run mode ..... 41**
**8.7 Product identification ..... 41**
**8.8 Updates ..... 42**

## 8.1 Description

The Windows based TTA-Set software is configuration software to set up the universal analogue conditioning module WAVE TTA via the interface CBX100 USB.

## 8.2 Installation

### System Requirements

- Operation system Windows 2000 (SP4+), Windows XP, Windows Vista
- IBM PC with a spare USB port
- Weidmüller CBX100 USB interface

### Installation note

**NOTE**

In order to install the program you need administrator rights on the computer involved.

Installation of the CBX100 driver:

With the file "CDM 2.04.06.exe" you can install the USB drivers for the CBX 100 interface.

Installing TTA-Set:

The TTA-Set software can be installed with the file "setup.exe".

### Getting Started

1. Open up Windows Explorer and select the “CDM 2.04.06” icon in the appropriate directory.
2. Double click on this icon and click OK to start the installation process
3. Open up Windows Explorer and select the “Set-up” icon in the appropriate directory.
4. Double click on this icon and click OK to start the installation process.
5. Follow the step by step instructions on the screen.

## 8.3 Starting/exiting TTA-Set

### Starting TTA-Set

You can start TTA-Set in two different ways:

1. Double-click on the icon on your computer desktop.
2. Click on the Windows Start button, then select: Programs > Weidmueller > TTA-Set.

### Exiting TTA-Set

You can exit TTA-Set in the following ways.

1. Click the Exit button.
2. Click the X on the window frame.

## 8.4 Title bar

### File

| | |
|---|---|
| New | Change the setting to default settings. |
| Open | Open a configuration file *.tta from the hard disk. |
| Save | Save the actually configuration to a file *.tta. |
| Print | Print the actually configuration. |
| Exit | Exit the software TTA Set. |


Figure 8 Title bar - File

### Settings

| | |
|---|---|
| Temperature unit | Set the unit of the temperature for the configuration. Celsius or Fahrenheit |
| Setpoint Unit | Set the unit of the digital output setpoint.<br>Percentage: of the input value or the same unit of the input signal. |

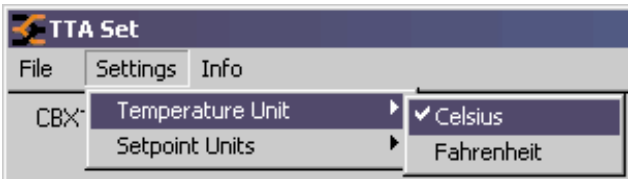



Figure 9 Title bar - Settings

### Info

| | |
|---|---|
| About | Open an information window about the software version and the contact address of Weidmüller. |


Figure 10 Title bar - Info

## 8.5 Overview parameters

| Input parameters | | | |
|---|---|---|---|
| Type of input | Voltage - Range | V: -20 … +50 V DC<br>Min. Span 0.5 V<br>mV: -200 … +500 mV DC<br>Min. Span: 4 mV | |
| | Current - Range | Passive<br>Range mA: -20 … +50 mA<br>Min. Span: 1 mA | |
| | | Active<br>Range mA: 0 … +20 mA<br>Min. Span: 1 mA | |
| | Type of Thermocouple | K: -200 … +1372 °C<br>J: -210 … +1200 °C<br>T: -200 … +400 °C<br>E: -200 … +1000 °C<br>N: -200 … +1300 °C | R: -50 … +1767 °C<br>S: -50 … +1767 °C<br>B: +50 … +1820 °C<br>L: -200 … +900 °C<br>U: -200 … +600 °C<br>User defined |
| | RTD | RTD type: | Connection type: |
| | | PT100<br>PT1000<br>NI100<br>NI1000<br>NI120<br>Cu10 Ω at 25 °C<br>Cu100 Ω at 0 °C<br>User defined | 2-wire<br>3-wire<br>4-wire |
| | Resistor - Range | 10 Ω… 5 kΩ | |
| | Potentiometer - Range | 10-50 Ω<br>50-100 Ω<br>100-200 Ω<br>200-400 Ω | 400-800 Ω<br>800-2 kΩ<br>2 k-6.5 kΩ<br>6.5 k-100 kΩ |
| | Frequency - Sensitivity | Frequency range:<br>Min. Span:<br>Voltage range Pin21:<br>Voltage range Pin22: | 2 Hz … 100 kHz<br>10 Hz<br>-50 V … +50 V DC<br>-30 V … +30 V DC |

| Pin | High noise reduction High Level | Low noise reduction Low Level | Max. voltage range |
|---|---|---|---|
| 22 | 550 mV | 140 mV | ±30 V |
| 21 | 7.8 V | 1.9 V | ±50 V |

## Transfer parameters

Transfer function

Transfer function for the output signal:

| Function | linear | SQRT | X^1.5 | X^2 | X^2.5 |
|---|---|---|---|---|---|
| formula | Out = In | Out = $In^{0,5}$ x 10 | Out = $In^{1,5}$ x 0.1 | Out = $In^{2}$ x 0.01 | Out = $In^{2,5}$ x 0.001 |
| Input in % | Output in % | Output in % | Output in % | Output in % | Output in % |
| 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | 10 | 32 | 3 | 1 | 0.3 |
| 20 | 20 | 45 | 9 | 4 | 2 |
| 30 | 30 | 55 | 16 | 9 | 5 |
| 40 | 40 | 63 | 25 | 16 | 10 |
| 50 | 50 | 71 | 35 | 25 | 18 |
| 60 | 60 | 77 | 46 | 36 | 28 |
| 70 | 70 | 84 | 59 | 49 | 41 |
| 80 | 80 | 89 | 72 | 64 | 57 |
| 90 | 90 | 95 | 85 | 81 | 77 |
| 100 | 100 | 100 | 100 | 100 | 100 |

In the SQRT function has low flow cut off. If the input Is smaller than 1% the out is zero.

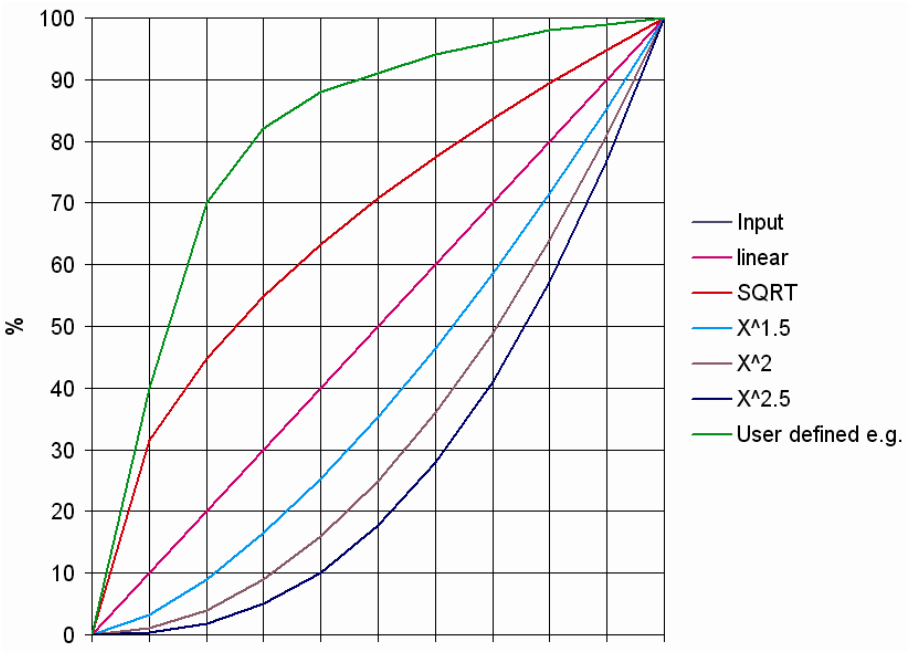



Figure 11 Transfer functions

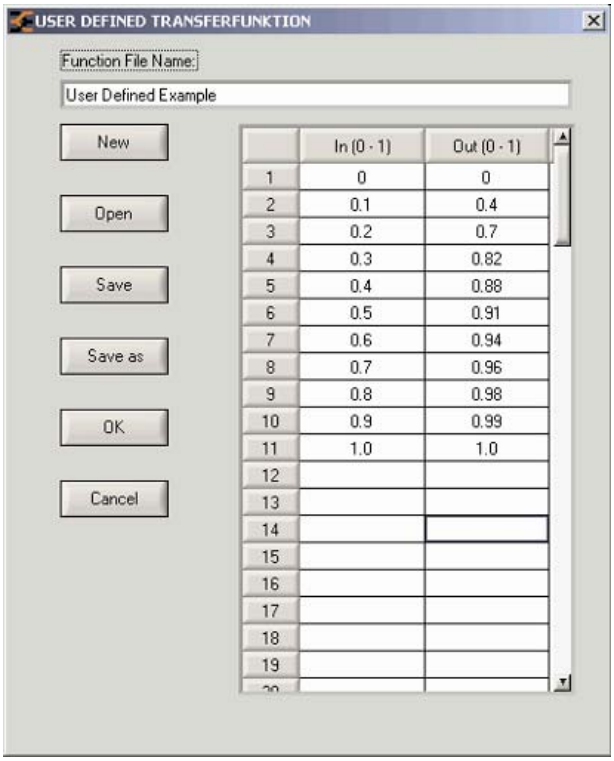



Figure 12 User define transfer function

ADC Speed

| Fast | Highest sampling rate | 9.5 ms |
|---|---|---|
| Medium | 50 - 60 Hz | 60 ms |
| Slow | 50 - 60 Hz | 180 ms |

Response Time

Response time is the time between an input step and the output step.

| ADC speed | Response time in ms | Voltage / Current | mV / Thermo | Potentiometer / RTD 3-Wire | RTD 2-Wire 4-Wire |
|---|---|---|---|---|---|
| Fast | min. | 140 | 60 | 90 | 60 |
| | max. | 1000 | 1000 | 1000 | 1000 |
| Medium | min. | 250 | 170 | 350 | 180 |
| | max. | 1070 | 1000 | 950 | 1050 |
| Slow | min. | 525 | 460 | 1020 | 470 |
| | max. | 1350 | 1280 | 1880 | 900 |

Range response time

| Analogue output parameters | | | |
|---|---|---|---|
| Type of output | | Voltage | Current |
| | | Voltage Max. Range:<br>-10.1 … +11 V DC<br>Min. Span: 2.5 V DC | Max. Range:<br>0 mA to 20 mA DC<br>Min. Span: 5 mA DC |
| | Output – range low | Lowest Value<br>This is the minimum voltage value at the output (related to 0% input). | Lowest Value<br>This is the minimum current value at the output (related to 0% input). |
| | Output – range high | Highest Value<br>This is the value at the output (related to 100% input). | Highest Value<br>This is the maximum current value at the output (related to 100% input). |
| | Direct or reverse function | Direct action is output increasing as input increases.<br>Reverse action is output decreasing as input increases. | Direct action is output increasing as input increases.<br>Reverse action is output decreasing as input increases. |
| | Output – low limit | Low Limit<br>This is the lowest possible value at the output. | Low Limit<br>This is the lowest possible value at the output. |
| | Output – high limit | High Limit<br>This is the highest possible value at the output. | High Limit<br>This is the highest possible value at the output. |
| | Output – for error condition | Output @ Error<br>If an input or TTA error occurs the output is set to this value. | Output @ Error<br>If an input or TTA error occurs the output is set to this value. |

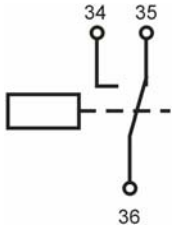
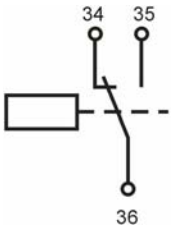
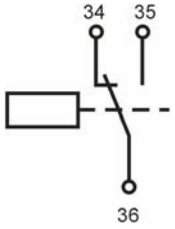
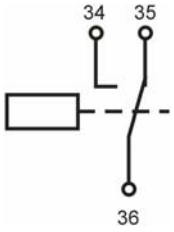
| Digital output parameters | | | | |
|---|---|---|---|---|
| Alarm | Item | Function | | |
| Operating modes | | Disabled<br>The alarm is disabled.<br>Low Type<br>The alarm is switched on, if the input value is lower than the setpoint.<br>High Type<br>The alarm is switched on, if the input value is higher than the setpoint.<br>Window<br>The alarm is switched on, if the input value is outside the window value: window range = setpoint ± window value<br>e.g.: setpoint 40%, window 10% = window value is from 30-50%.<br>Input Error<br>If an input or TTA error occurs the output is set to this value. | | |
| | Alarm Relay | Normally energised | No alarm<br>  <br><br>Coil on | Alarm<br>  <br><br>Coil off |
| | | Normally de-energised | No alarm<br>  <br><br>Coil off | Alarm<br>  <br><br>Coil on |
| Settings | Set Point | This is the relay switch on value 0…100% | | |
| | Deadband | Switch off hysteresis in percent<br>e.g. high type, setpoint 50% and deadband 2%: the alarm switches on if the value reaches 50% and switches off if the value decreases to 48%. | | |
| | On Delay | Switch on delay in seconds<br>In 0.1 second steps | | |
| | Off Delay | Switch off delay in seconds<br>In 0.1 second steps | | |
| | Window | Set a range around the Setpoint in percent | | |

Table 9 Parameter

### High Alarm

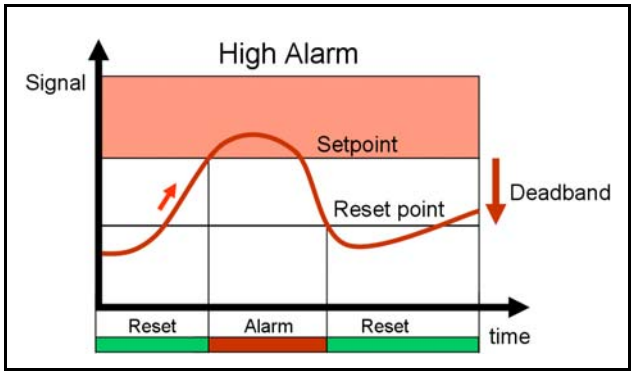



Figure 13 High Alarm

### Window Alarm

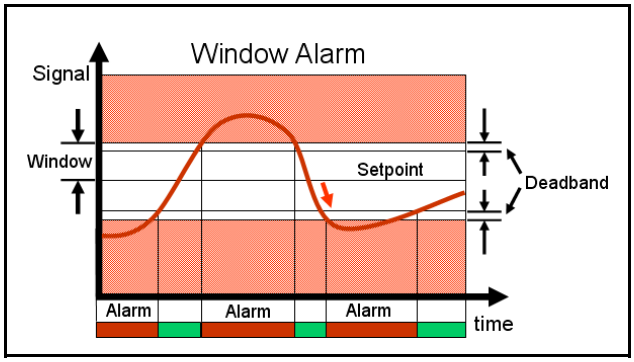



Figure 15 Window Alarm

### Low Alarm

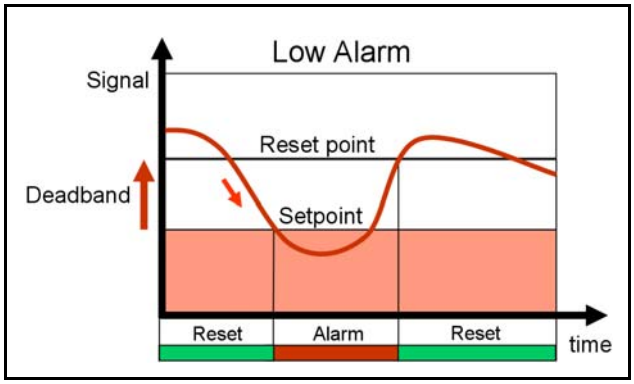



Figure 14 Low Alarm

### Alarm Time Delay

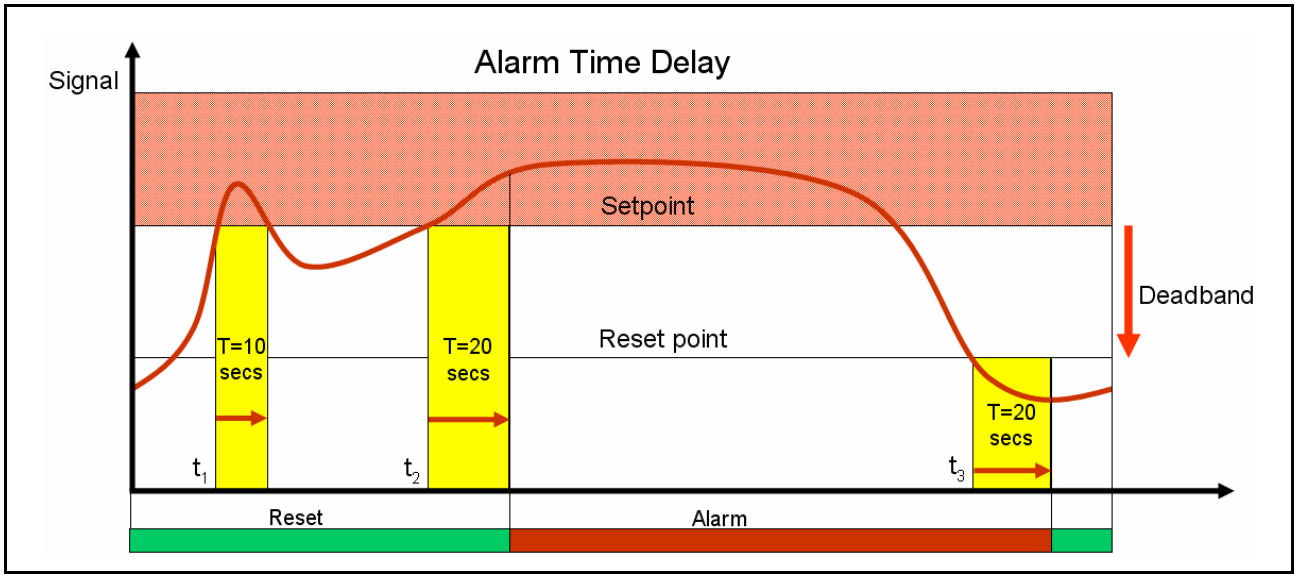



Figure 16 Alarm Time Delay

In this example the time delay is set for 20 seconds. At $t_1$ the measurement exceeds the alarm value, but this only lasts for 10 seconds so there is no trip. At $t_2$ the measurement again exceeds the alarm trip value and this lasts for longer than 20 seconds so the alarm trip occurs after 20 seconds.

## 8.6 Run mode

Start communication with the TTA

1 Connect the WAVE TTA to a Power supply.

2 Connect the TTA with the CBX100 USB interface to an USB port.

3 Start the software TTA-Set.

4 Input configuration
Select the input value.

5 Output configuration
Select the output value.

6 Alarm configuration
Set the alarm relay behaviour.

7 Send configuration to TTA
The button “Save to Instrument” transmits the new configuration to the TTA.

8 Enter Password
Enter your password (the default password is 0000). To reset a personal password, send a request with the serial number of the Wave TTA to the following e-mail address:
password.tta@weidmueller.com

9 Read Values
With the button “Read Values” the actual values of the TTA are displayed in the window “Running values”.
If the button “Read Continuous” is activated the values are updated every second (monitoring).

10 Read from Instrument
To check the current configuration in the connected TTA click on the “Read from instrument” button.

### Running values

- Input: TTA input value in percent.
- Output: TTA output value in percent.
- CJC Temperature: This the temperature in Centigrade or Fahrenheit at the cold junction point in the WAVE TTA.
- Alarm1: Shows the status of the first alarm relay
  - LED = red = relay switched on (alarm)
  - LED = off = relay switched off (no alarm)
- Alarm2: Shows the status of the second alarm relay
  - LED = red = relay switched on (alarm)
  - LED = off = relay switched off (no alarm)

## 8.7 Product identification

| Unit Type: | Description of the module |
|---|---|
| Serial No.: | The serial number is printed on the side of the module. |
| Firmware No.: | The firmware number of the TTA device which is connected. |
| Configured by: | The company name of the person who last configured the module. |
| Initials: | Initials or the name of the person who last configured the module. |
| Date: | The date when the module was last configured the module. |
| ID Tag: | Typically, the user’s plant reference |
| User Reference: | User descriptor |
| Version: | The Version of the software |
| Terminals: | Shows the terminal number where the sensor and output signals are connected. |

Table 10 Product identification

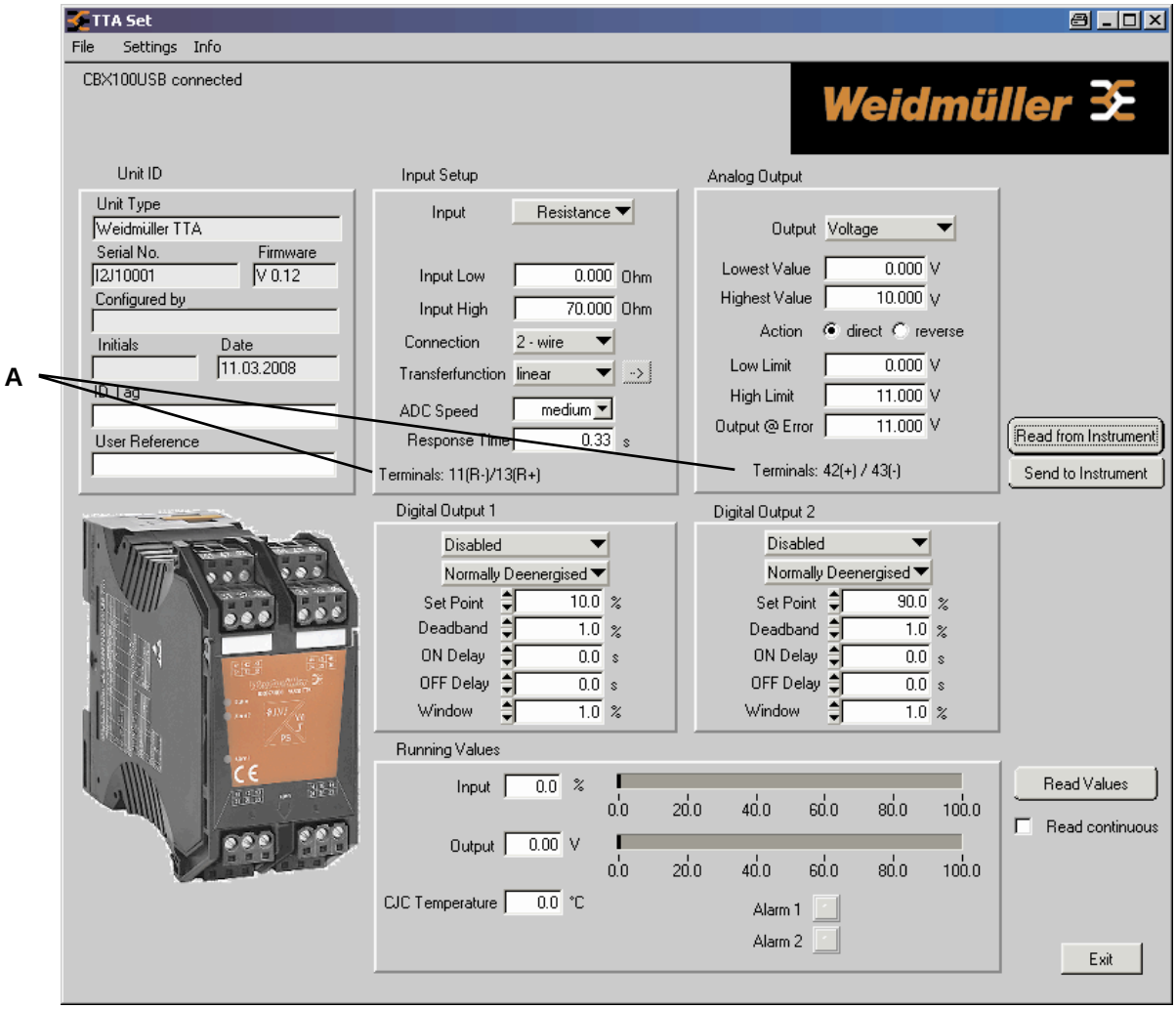



Figure 17 Product identification

**A** Terminals

## 8.8 Updates

### Downloading the latest version

The latest version of the TTA-Set Software is available from the Weidmüller website at www.weidmueller.com.

# 9. Testing the product

**9.1 Test procedure .....44**

## 9.1 Test procedure

Following equipment is necessary to test the Wave TTA:

- Wave TTA Module: WAS 6 TTA (Order No. 893967) or WAZ 6 TTA (Order No. 893968)
- USB Interface unit CBX 100 USB (for configuration),
- Power supply - see chapter 5.3 - (e.g. 24 Vdc, such as model CP SNT 12 W (Order No. 991884 0024))
- Configuration Software TTA Set (for configuration)
- PC or Laptop, (for configuration)
- To test input to output transfer function an appropriate input signal source is needed, such as:
  - Calibrator Portacal 1000 (Order No. 7940010194) for DC current and Voltage input signals
  - Potentiometer e.g. 5 kΩ
  - Resistance box
  - Thermocouple source or “Millivolts source”
- Output meter (e.g. a dvm) to measure the range of voltage or current produced.

**NOTE**

Depending on the measurement accuracy required from the Wave TTA, the input signal source and output meter errors should sum to typically better than 1/3 of the accuracy required.

1 Mount the Wave TTA with the power supply on a DIN rail and consider the following connection diagram in chapter 6.

2 Connect the input sensor e.g. potentiometer, and output meter.

3 For configuration, install TTA Set configuration software as shown in the chapter 8.


Figure 18 Screenshot TTA

1 Select the input signal type e.g. „Potentiometer“ and set the input values „Input Low“ and „Input High“.
2 Select and set the output signal type required („Current“ or „Voltage“).
3 Select and set the digital outputs as required.
4 Click the button „Send to Instrument“.
5 Turn the potentiometer to set a value.
6 Click the button „Read Values“.
7 The current values will be shown by the green bar graph and the alarm signals by red indicators.

# 10. Troubleshooting

**10.1 Troubleshooting ..... 48**

## 10.1 Troubleshooting

If a Wave TTA is not working as expected, the best view of its complete set-up is via the configuration software TTA SET.

Below are some examples of checks which can help the user overcome connection or configuration errors.

### No communications

**Configuration is being checked**, TTA SET software is installed, the TTA device is connected via the CBX100USB, but there is no communication.

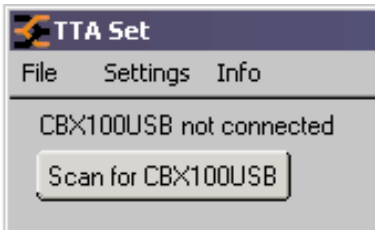



Figure 19 Com Port configuration and settings

It could be a software or hardware problem.

1. Check your comport settings. The TTA-SET will show (on the top left) the current USB comport.
2. Check that the CBX 100 is connected between the TTA and your computer.
3. Check that the TTA device is powered within the range given in the specifications.

### No Status LED indication

The Wave TTA is installed, the wiring is done, but it shows no LED indication.

1. Check the power supply and consider the wiring diagrams and descriptions in chapter 5 and 6.
2. Ensure that the input / output connections are correct.

### The green Status LED is flashing

It indicates sensor wiring (short circuit or open circuit) or internal fault.

See description in chapter 4 to identify fault source.

### The DC output is incorrect

1. Ensure the input type and range are configured as required and wiring connections are correct.
2. Check the output configuration settings for correct range and transfer functions including direct or re-verse action.

### The alarm relays have no function

1. Check the relay configuration settings including set-point, alarm type are as required and as described in chapter 8.
2. Check the input type and range is as required.
3. Check the input connections are made correctly.

### The alarm relays are on / off with the wrong values of input

1. Check the relay configuration settings including set-point, alarm type are as required and as described in chapter 8.
2. Check the input type and range is as required.
3. Check the input connections are made correctly.

# Appendix

**Appendix A: Article Overview .....50**
**Index .....51**

# Appendix A: Article Overview

| Modules | |
|---|---|
| WAVE TTA | |
| WAS6 TTA | 8939670000 |
| WAZ6 TTA | 8939680000 |
| USB Interface | |
| CBX100USB | 7940025031 |
| Accessory | |
| WS 15/5 MC NEUTRAL PU 480 | 1609880000 |

Table 11 Article overview

# Index


| Figure | | Page |
|---|---|---|
| Figure 1 | Handling | 12 |
| Figure 2 | Installation overview | 15 |
| Figure 3 | LEDs | 18 |
| Figure 4 | Functional block diagram | 19 |
| Figure 5 | Mounting on DIN rail | 24 |
| Figure 6 | Module marker | 25 |
| Figure 7 | Configuration / diagram wiring | 30 |
| Figure 8 | Title bar - File | 32 |
| Figure 9 | Title bar - Settings | 33 |
| Figure 10 | Title bar - Info | 33 |
| Figure 11 | Transfer functions | 35 |
| Figure 12 | User define transfer function | 36 |
| Figure 13 | High Alarm | 39 |
| Figure 14 | Low Alarm | 39 |
| Figure 15 | Window Alarm | 39 |
| Figure 16 | Alarm Time Delay | 40 |
| Figure 17 | Product identification | 42 |
| Figure 18 | Screenshot TTA | 45 |
| Figure 19 | Com Port configuration and settings | 48 |

| Table | | Page |
|---|---|---|
| Table 1 | Status indicators | 18 |
| Table 2 | Input fault detection | 18 |
| Table 3 | Specifications | 21 |
| Table 4 | Power supply | 26 |
| Table 5 | Input | 26 |
| Table 6 | Analogue output | 27 |
| Table 7 | Digital output | 27 |
| Table 8 | Default settings | 30 |
| Table 9 | Parameter | 38 |
| Table 10 | Product identification | 41 |
| Table 11 | Article overview | 50 |

# www.weidmueller.com

Weidmüller Interface GmbH & Co. KG
Postfach 3030
32720 Detmold
Klingenbergstraße 16
32758 Detmold
Phone +49 (0) 5231 14-0
Fax +49 (0) 5231 14-2083
E-Mail info@weidmuller.com
Internet www.weidmueller.com

Order number:
5662300000/00/04.08