



# WAVE TTA

Manual



# Foreword

## Revision history

Version	Date	Change
0.0	04/08	First edition
1.0	08/10	WAVE TTA EX products complemented and editorial changes

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### 1.1 CE

CE Declaration is available from Weidmüller.

### 1.2 UL

Listing approval cULus

### 1.3 GL

Germanischer Lloyd approval  
for products: 8939670000 and 8939680000

### 1.4 ATEX

Approval according ATEX directive EN 60079-0 and EN 60079-15 for NON Sparking  
for products: 8964310000 und 8964320000

### 1.5 Class 1 Division 2

Approval according C1D2 Zone 2: ISA121201  
for products: 8964310000 und 8964320000



2. Warrantee statement

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## **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. Save where expressly 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 expressly 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

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### 3.1 Electrical precautions

	<b>DANGER!</b>
This product may be connected to potentially lethal voltages!	

	<b>DANGER!</b>
The configuration plug jack must only be used for configuration in <b>non-hazardous</b> areas!	

	<b>WARNING!</b>
<ul style="list-style-type: none"> <li>• Before you remove or mount the unit, turn-off the power supplies – i.e. to the instrument and to the relays, if used.</li> <li>• Product electronics must not be removed from its enclosure without disconnecting power sources.</li> <li>• Follow ESD installation regulations, including the EMI precautions given in chapter 6.</li> </ul>	

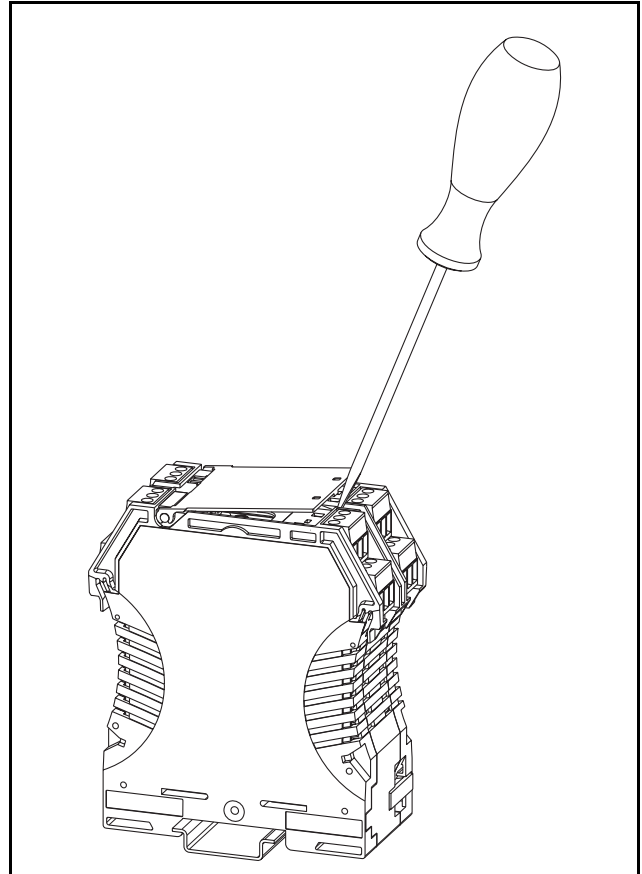


Figure 1 Handling

### 3.2 Handling

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

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

Unpack the product carefully, and ensure the operating instruction sheet 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).

## 4. Introduction

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## 4.1 Symbol identification



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
WAS6 TTA EX	8964310000
WAZ6 TTA EX	8964320000
CBX100 USB	7940025031
CBX200 USB	8978580000

The only difference between the products is the connection type. The WAS6 TTA and WAS6 TTA EX has screw connectors. The WAZ6 TTA and WAZ6 TTA EX 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 or CBX200 USB) interface and (TTA Set) software. The WAVE 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 WAVE 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 WAVE TTA.

## Typical Applications

Typical of applications for the WAVE 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 WAVE 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.

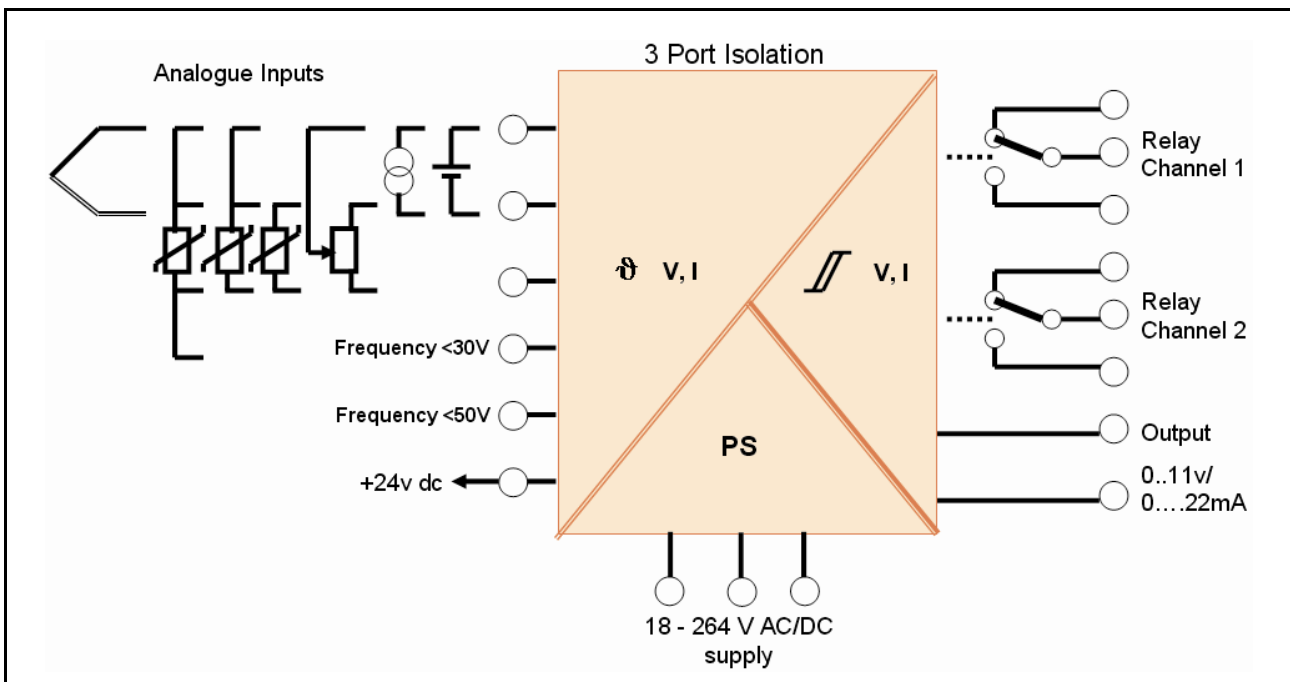


Figure 2 Installation overview





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## 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 ( $< 3.6 \text{ mA}$  or  $> 21 \text{ mA}$ )

### 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

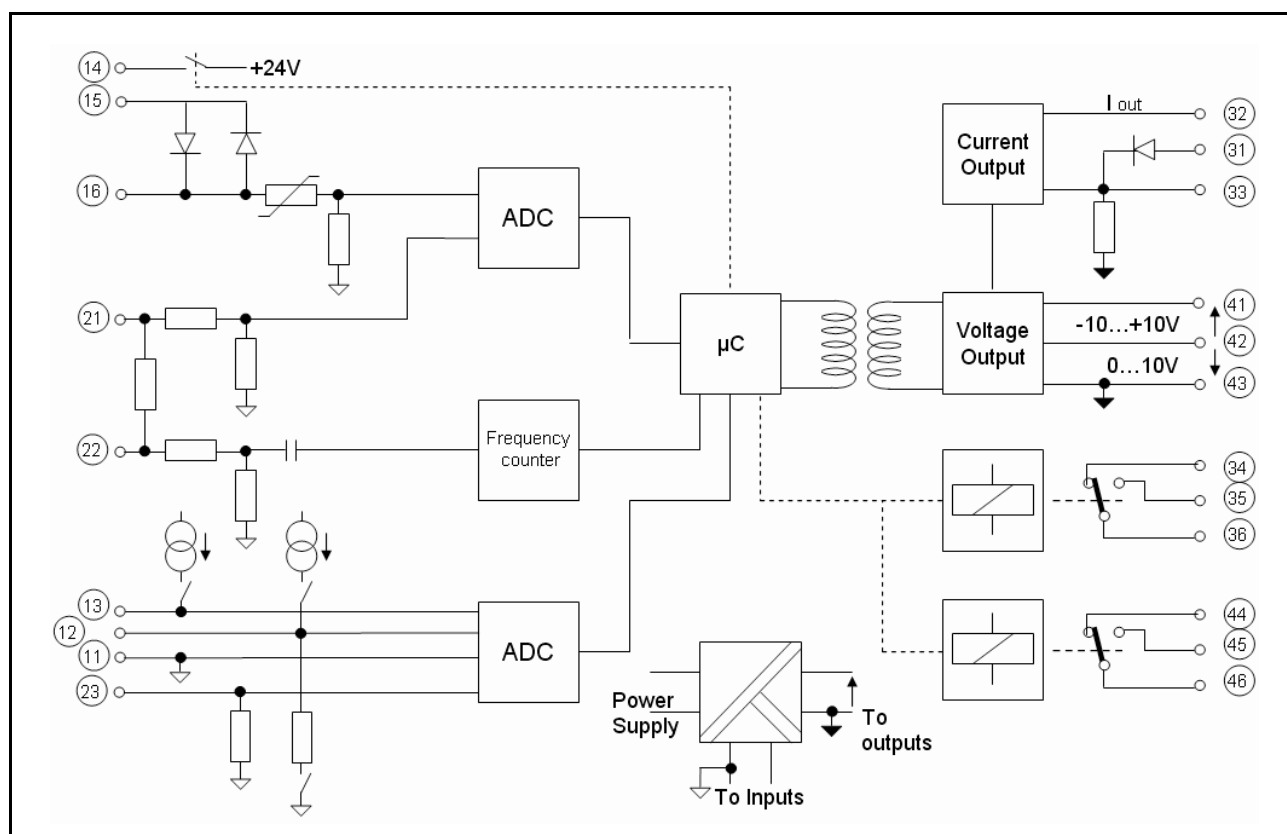


Figure 4 Functional block diagram

## 5.3 Specifications

Input types	
Thermocouple	Range -200...+1820 °C 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), 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 Relay	
Relays	2 x SPCO
Max voltage and current AC	250 V AC / 2 A
Max voltage and current DC	30 V DC / 2 A
General Data	
Rated voltage	24...240 V AC/DC 24...36 V AC / 24...50 V AC (ATEX Zone 2)
Min. / max. power supply (ac- cording VDE)	18...264 V AC/DC 18...40 V AC / 18...56 V DC (ATEX Zone 2)
Rated power	< 3,5 W
Ambient operating range	-40...+70 °C
Isolation test	1,5 kVeff / 1 min. between PE and power supply, as well as between PE and input or output 2,5 kVeff / 1 min between input and output

Rated insulation voltage	300 V protective separation between power supply and input or output, as well as between Relay output and all other circuits 100 V protective separation between input and output 300 V basic insulation between input and output
<b>Performance</b>	
Accuracy	DC, RTD inputs <0.1% span. Thermocouple inputs: 0.2% span (or 1 °C) + CJ error
Ambient temp effects	DC & RTD inputs < 0.01%/K Thermocouple inputs < 0.01% of full scale/K + CJ error 0.07 °C/K
Step Response/ Cut-off Frequency	Settable within 60 ms -1880 ms / 1 Hz (3 dB)
<b>Physical</b>	
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 WAVE TTA	CE, cULus, GL
Approvals WAVE TTA EX	CE, cULus, Class 1 Division 2 / Zone 2, ATEX Zone 2
<b>Type</b>	<b>Order No.</b>
WAS6 TTA	8939670000 (screw connectors)
WAZ6 TTA	8939680000 (tension clamp connectors)
WAS6 TTA EX	8964310000 (screw connectors)
WAZ6 TTA EX	8964320000 (tension clamp connectors)

Table 3 Specifications



## 6. Installation

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## 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.

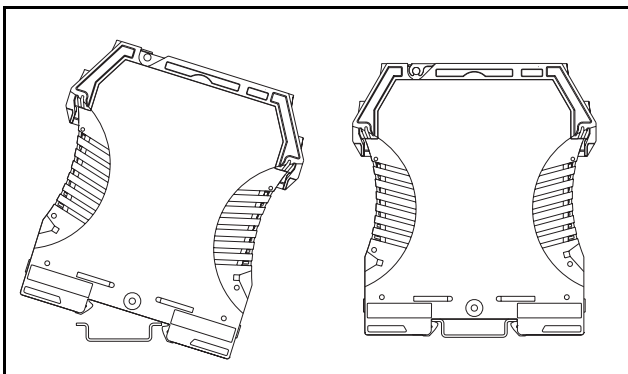


Figure 5 Mounting on DIN rail

### 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.

The WAVE TTA EX are suitable for EX applications and approved for installation in Zone 2. They shall be installed in an enclosure providing a degree of protection of at least IP54.

### 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 WAVE 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.

#### NOTICE



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



## 6.3 Marking

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

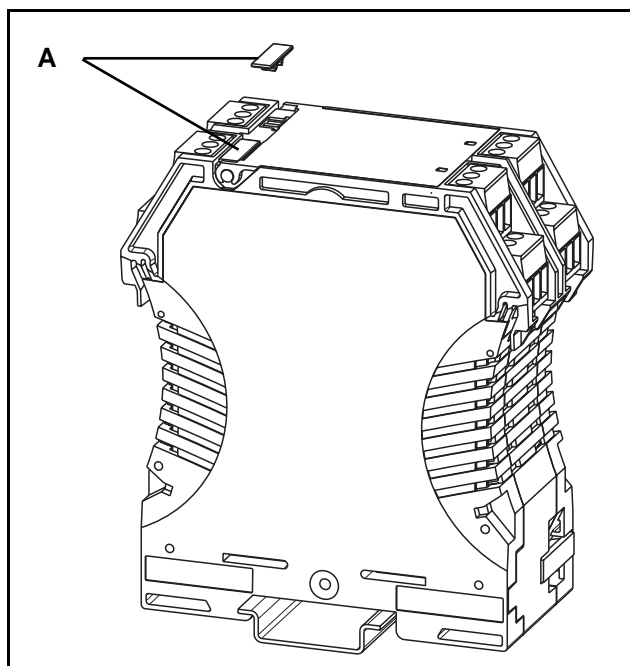


Figure 6 Module marker

**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).

### WARNING!



WAVE TTA and PC have to be fully de-energized, before the programming interfaces CBX100 USB or CBX200 USB will be connected.

### NOTICE



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 WAVE TTA housing.

### Connection diagram – Power supply

Term. No.	
24	0 V
25	PE
26	24 - 240 V DC / AC

Table 4 Power supply

### Connection diagram – Input

Term. No.	I <sub>Passive</sub> <50 mA	I <sub>Active</sub> <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 <sub>Return</sub> / 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 relay

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



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## 7.1 Default setting

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

Table 8 Default settings

## 7.2 CBX100 USB and CBX200 USB introduction

The CBX100 USB or CBX200 USB 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 USB or CBX200 USB.

## 7.3 Configuration / diagram wiring

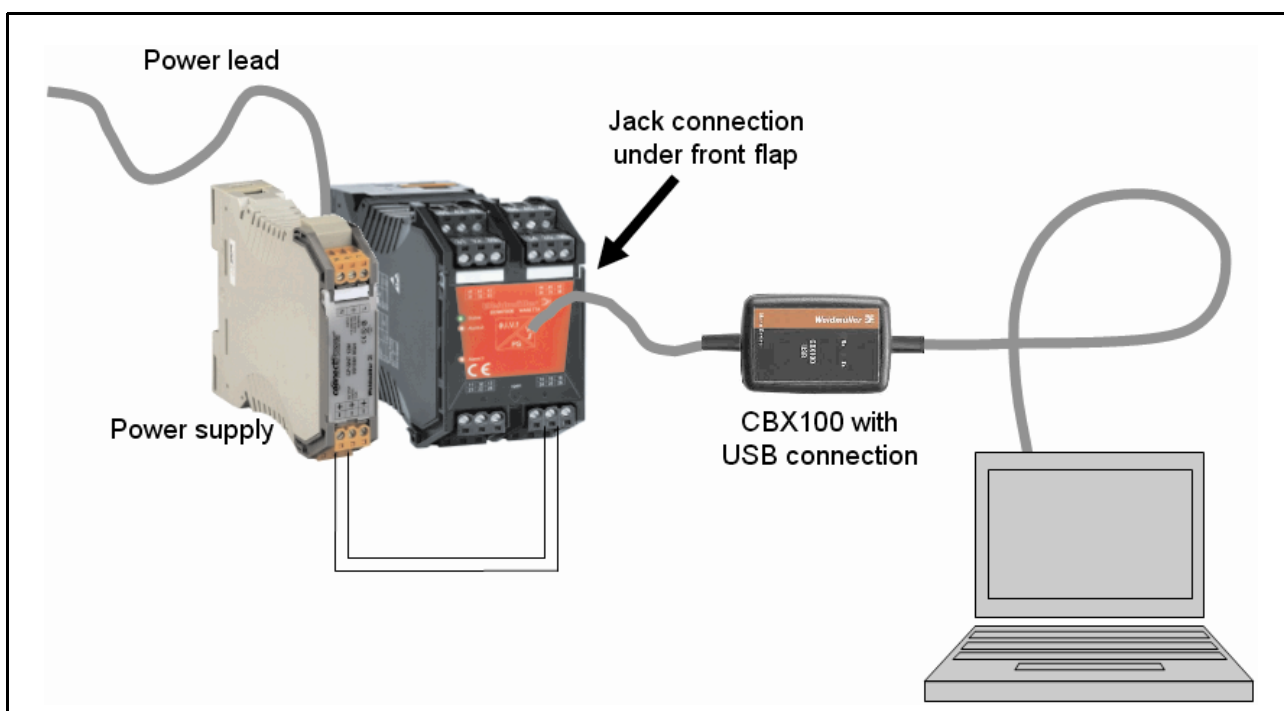


Figure 7 Configuration / diagram wiring

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## 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 or CBX200 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 or CBX200 USB interface

### Installation note

	<b>NOTICE</b>
	In order to install the program you need administrator rights on the computer involved.


Installing TTA Set:

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

## 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

### Language

The menu text will be displayed depending on the selection in english or german language.



Figure 9 Title bar - Language



## Settings

**Temperature unit** Set the unit of the temperature for the configuration. Celsius or Fahrenheit



Figure 10 Title bar - Settings - Temperature unit

**Setpoint / Running Values** Settings from the unit (percent or input units) of the trigger level of the digital outputs and the input unit of the running value indication.

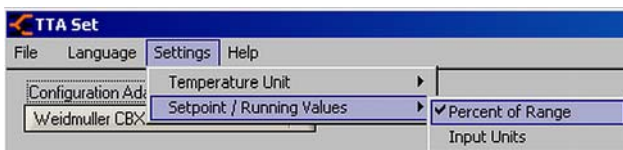


Figure 11 Title bar - Settings - Setpoint unit

## Info

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



Figure 12 Title bar - Info

## 8.5 Overview parameters

Input parameters				
Type of input	Voltage - Range	V: -20 ... +50 V DC Min. Span 0.5 V mV: -200 ... +500 mV DC Min. Span: 4 mV		
	Current - Range	Passive Range mA: -20 ... +50 mA Min. Span: 1 mA		
		Active Range mA: 0 ... +20 mA Min. Span: 1 mA		
	Type of Thermocouple	K: -200 ... +1372 °C J: -210 ... +1200 °C T: -200 ... +400 °C E: -200 ... +1000 °C N: -200 ... +1300 °C	R: -50 ... +1767 °C S: -50 ... +1767 °C B: +50 ... +1820 °C L: -200 ... +900 °C U: -200 ... +600 °C User defined	
RTD	RTD type:	Connection type:		
	PT100 PT1000 NI100 NI1000 NI120 Cu10 Ω at 25 °C Cu100 Ω at 0 °C User defined	2-wire 3-wire 4-wire		
Resistor - Range	10 Ω... 5 kΩ			
Potentiometer - Range	10-50 Ω 50-100 Ω 100-200 Ω 200-400 Ω	400-800 Ω 800-2 kΩ 2 k-6.5 kΩ 6.5 k-100 kΩ		
Frequency - Sensitivity	Frequency range: Min. Span: Voltage range Pin21: Voltage range Pin22:	2 Hz ... 100 kHz 10 Hz -50 V ... +50 V DC -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 <sup>1.5</sup>	X <sup>2</sup>	X <sup>2.5</sup>
formula	Out = In	Out = $\ln^{0.5} \times 10$	Out = $\ln^{1.5} \times 0.1$	Out = $\ln^2 \times 0.01$	Out = $\ln^{2.5} \times 0.001$
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.

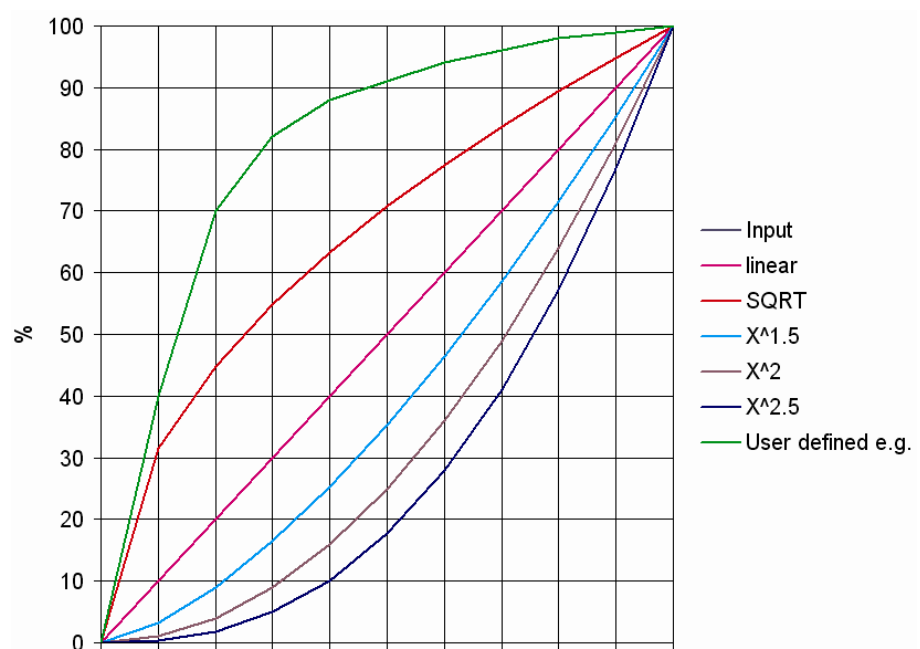


Figure 13 Transfer functions

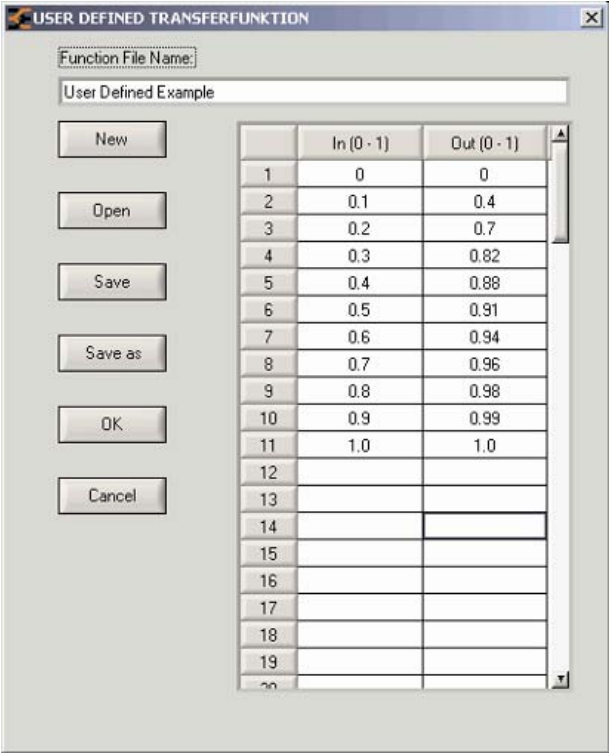


Figure 14 User-defined transfer function

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.

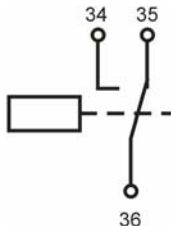
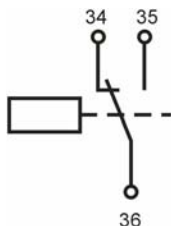
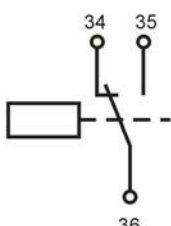
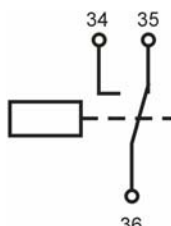
ADC speed	Response time in ms	Voltage / Current	mV / Thermo	Potentiometer / RTD 3-Wire	RTD 2-Wire 4-Wire
Fast	min.	140	60	90	60
	max.	1000	1000	1000	1000
Medium	min.	250	170	350	180
	max.	1070	1000	950	1050
Slow	min.	525	460	1020	470
	max.	1350	1280	1880	900

Range response time

**Analogue output parameters**

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

## Digital output parameters

Alarm output	Function		
Operating modes	Disabled		
	The alarm is disabled.		
	Low Type		
	The alarm is switched on, if the input value is lower than the setpoint.		
	High Type		
	The alarm is switched on, if the input value is higher than the setpoint.		
Function circuit	Window		
	The alarm is switched on, if the input value is outside the window value:		
	window range = setpoint $\pm$ window value		
	e.g.: setpoint 40%, window 10% = window value is from 30-50%.		
	Input Error		
	If an input or WAVE TTA error occurs the output is set to this value.		
Settings	ON		
	The alarm relay is activated after power on.		
	Alarm Relay	Normally energised	No alarm
			
			Coil on
			Alarm
			
			Coil off
	Alarm Relay	Normally de-energised	No alarm
			
			Coil off
			Alarm
			
			Coil on
Settings	Setpoint	This is the relay switch on value 0...100%	
	Deadband	Switch off hysteresis in percent	
		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	
		In 0.1 second steps	
Settings	OFF Delay	Switch off delay in seconds	
		In 0.1 second steps	
Settings	Window	Set a range around the Setpoint in percent	

Error Action	Alarm ON
	The alarm relay is activated when an error is detected.
	Alarm OFF
	The alarm relay is deactivated when an error is detected.
	Hold
	The alarm relay hold the actually status.
	None
	No reaction on an error.

Table 9 Parameter

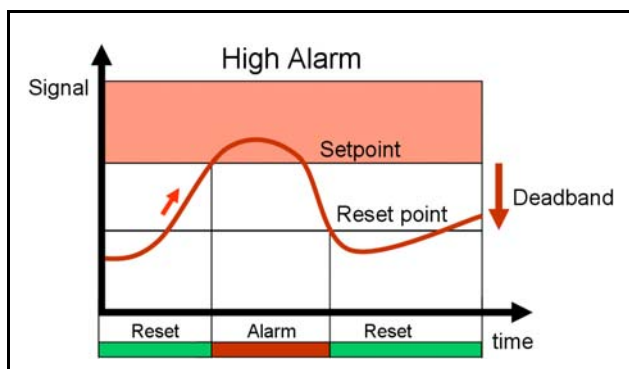
**High Alarm**

Figure 15 High Alarm

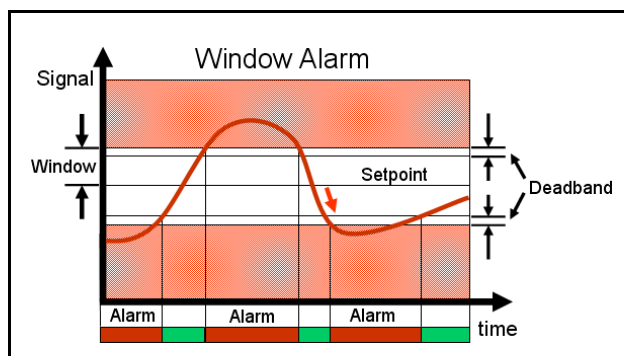
**Window Alarm**

Figure 17 Window Alarm

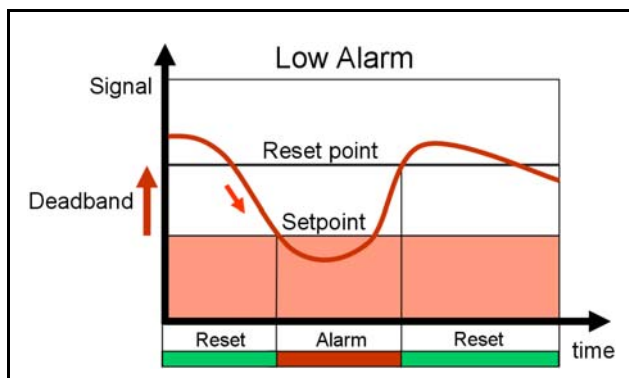
**Low Alarm**

Figure 16 Low Alarm

## Alarm Time Delay

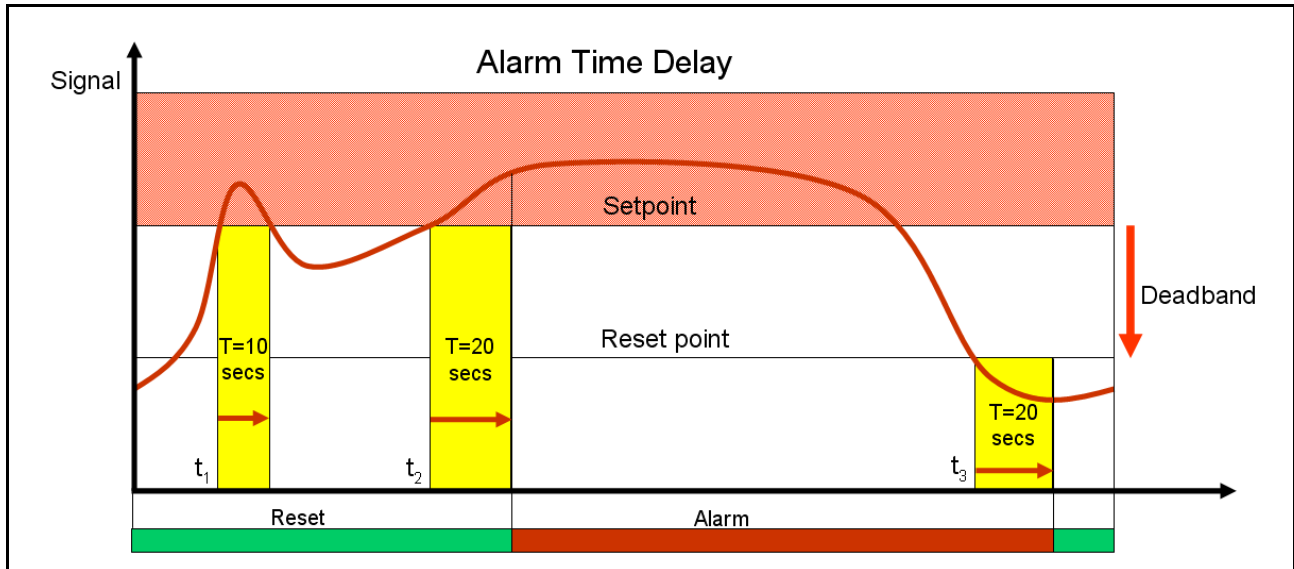


Figure 18 Alarm Time Delay

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 WAVE TTA

- 1 Connect the WAVE TTA to a Power supply.
- 2 Connect the WAVE TTA with the CBX100 USB or CBX200 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 WAVE TTA  
The button "Save to Instrument" transmits the new configuration to the WAVE 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 WAVE 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 WAVE TTA click on the "Read from instrument" button.

### Running values

- Input: WAVE TTA input value in percent.
- Output: WAVE 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 WAVE 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

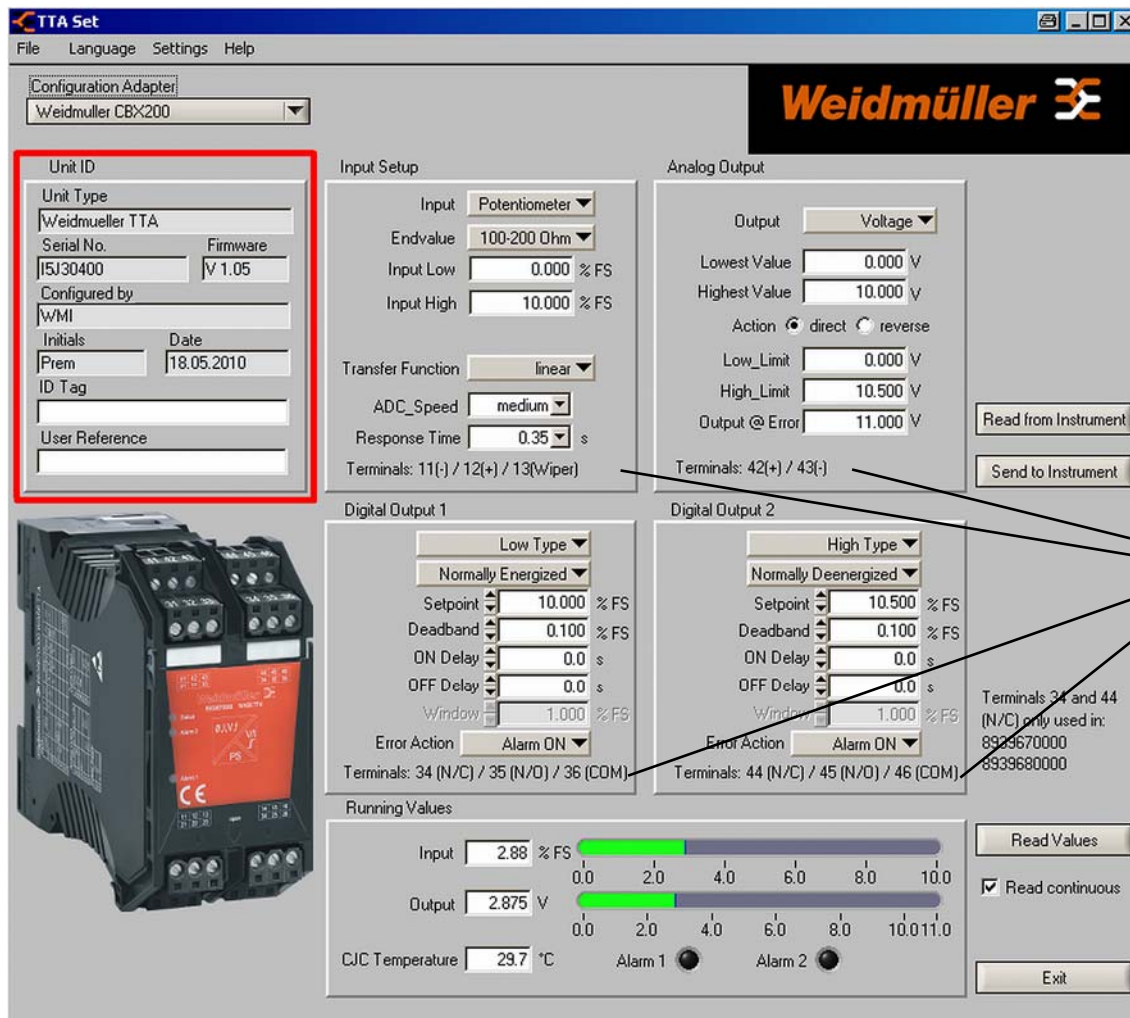


Figure 19 Unit-ID

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](http://www.weidmueller.com).

## 9. Testing the product

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## 9.1 Test procedure

Following equipment is necessary to test the WAVE TTA:

- WAVE TTA Module:  
WAS 6 TTA (Order No. 8939670000) or WAZ 6 TTA (Order No. 8939680000)  
WAS 6 TTA EX (Order No. 8964310000) or WAZ 6 TTA EX (Order No. 8964320000)
- USB Interface unit CBX100 USB or CBX200 USB (for configuration)
- Power supply - see chapter 5.3  
(e.g. 24 V DC, such as model CP SNT 12 W (Order No. 9918840024))
- 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 Portocal 1000 (Order No. 7940010194) for DC current and Voltage input signals
  - Potentiometer e.g. 5 k $\Omega$
  - Resistance box
  - Thermocouple source or "Millivolts source"
- Output meter (e.g. a dvm) to measure the range of voltage or current produced.



### NOTICE

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.

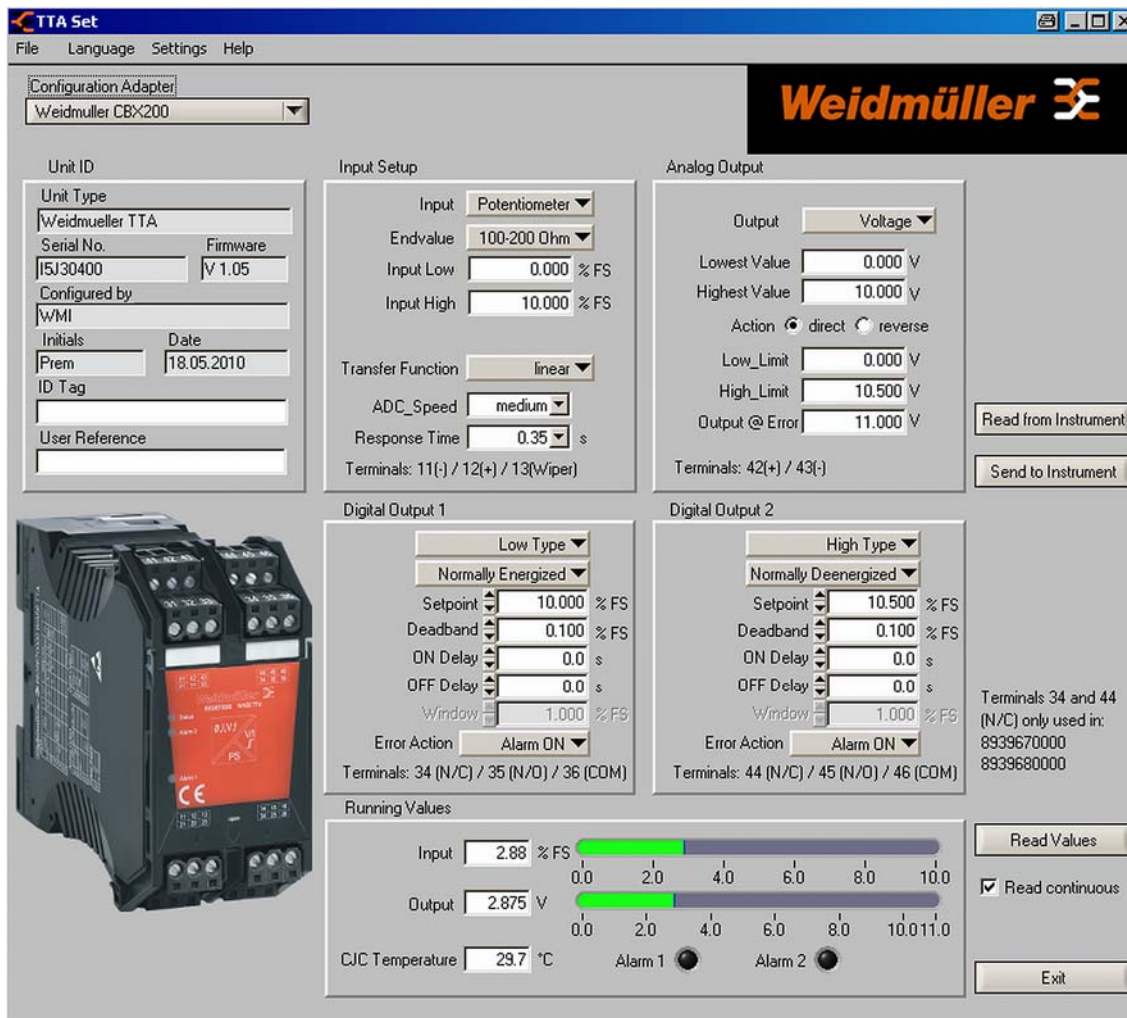


Figure 20 Screenshot TTA

- 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

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## 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 WAVE TTA device is connected via the CBX100 USB or CBX200 USB, but there is no communication.



Figure 21 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 CBX100 USB or CBX200 USB is connected between the WAVE TTA and your computer.
- 3 Check that the WAVE 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

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## Appendix A: Article Overview

Modules		
WAVE TTA		
WAS6 TTA		8939670000
WAZ6 TTA		8939680000
WAS6 TTA EX		8964310000
WAZ6 TTA EX		8964320000
USB Interface		
CBX100 USB		7940025031
CBX200 USB		8978580000
Accessory		
WS 15/5 MC NEUTRAL PU 480		1609880000

Table 11 Article overview

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