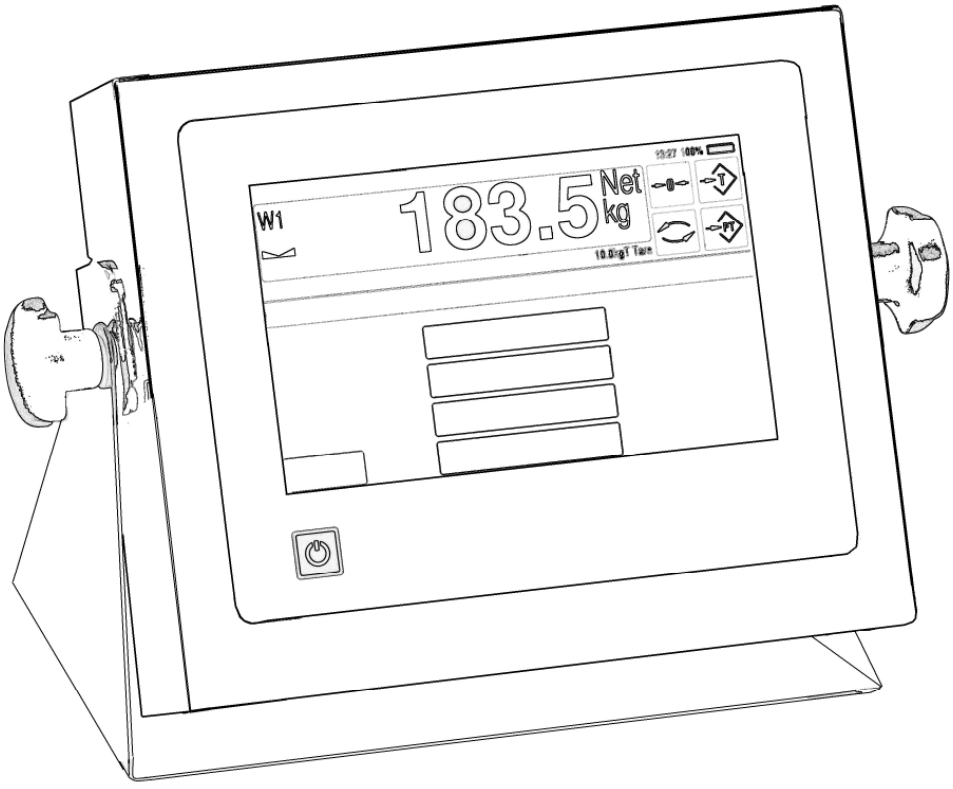
SysTec Systemtechnik und Industrieautomation GmbH

Technical Manual

IT6000ET



Industrial Weighing Terminal
With Touch Screen

July 2013

ST.2309.1476

Rev. 1

Technical Manual IT6000ET

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Please Note:

While every precaution has been taken in the preparation of this manual, SysTec GmbH assumes no responsibility for errors or omissions. Neither is any liability assumed for damages resulting from the use of the information contained herein.

The publisher is grateful for any information and/or advice that may contribute to correct errors or omissions in following editions.

Contents

1 Introduction

IT6000ET is a universal industrial weighing terminal for weighing and data capture applications. A touch sensitive 7" TFT color display is used for operation and indication of weight and additional information. This manual contains information and Technical Data for installation and operation of the IT6000ET weighing terminal and the optional power supply unit 'ITX000ET Externes Netzteil' (external power supply).

Further information is provided in the following manuals:

- ADM / DUAL-ADM / ADM8000-Exi Calibration Manual, order-No.: ST.2309.0688
- Digital Loadcells Calibration Manual, order-No.: ST.2309.1568 (in preparation).

1.1 Safety Symbols Used In This Manual

Safety relevant information is shown with corresponding symbols as follows:

W A R N I N G
Failure to observe this precaution could result in serious injuries or fatal accidents. Please make absolutely sure that these precautions are observed in order to ensure safe operation of the equipment.

CAUTION
Failure to observe this precaution could result in damage to or destruction of the equipment or bodily harm! Please make absolutely sure that these precautions are observed in order to ensure safe operation of the equipment.

Note: This indicates an advice for the designated use of the equipment and/or additional information to avoid inappropriate handling.

1.2 General Safety Advice

W A R N I N G
Exercise utmost care when making checks, tests and adjustments that can actuate movable parts such as feeding devices, gates, flaps, conveyors, etc. Make absolutely sure that nobody is within reach of movable parts.
Failure to observe this precaution could result in bodily injury!

W A R N I N G
This unit must not be operated in a potentially explosive atmosphere!
It is the sole responsibility of the user to classify the area of installation and make sure that absolutely no potentially explosive atmosphere can be present at any time!

CAUTION
When this unit is included as a component part of a system, the resulting system design must be reviewed by qualified personnel who are familiar with the construction and operation of all individual components in the system and the potential hazards involved. Failure to observe this precaution could result in bodily injury!

CAUTION
This unit must be installed, serviced, and operated in strict compliance with all locally applicable safety regulations and the rules for the prevention of accidents!

CAUTION
The power supply unit provides SELV voltages in accordance with EN 60950. Make sure that any peripheral device connected to the weighing terminal containing its own power supply also uses SELV voltages!

CAUTION
This module and its associated equipment must be installed, adjusted and maintained by qualified personnel only!

W A R N I N G
For the storage of volatile data the terminal contains a lithium battery. Risk of explosion if battery is replaced improperly! Replace only with battery of the same type or with compatible type recommended by manufacturer. Disposal of used batteries only as indicated by manufacturer.

If the external power supply unit 'ITX000ET Externes Netzteil' (external power supply) is used, also the following instructions must be observed:

W A R N I N G
Before opening the housing pull the power plug or disconnect the unit from the mains supply. Risk of electrical shock!

CAUTION
Input voltage of the unit must comply with local mains supply!

CAUTION
If the line cord with connector is used as the means to separate the power supply from the mains, the wall outlet must be installed close to the unit and must be easily accessible! If a permanently connected mains cable is used, an easily accessible separator must be included in the supply circuit!

W A R N I N G
The device uses the short-circuit / overcurrent protection of the on-site mains supply.

Note:

- The unit does not have a mains switch and is operational immediately after connection to the mains supply!
- Only permit qualified personnel to operate this instrument!
  Disconnect all power to this instrument before cleaning and servicing!
- All switch gear connected to the unit and/or installed close to it, such as relays and contactors, must be fitted with appropriate components (RC-modules, diodes) to suppress interference.
- In order to avoid static discharge, all metallic parts of a system must be thoroughly grounded. Movable parts, such as portable scales on plastic wheels, must be grounded with earth clamps or earth leads of appropriate diameter.
- Keep this manual for future reference!

1.3 Declaration Of Conformity IT6000ET

SysTec Systemtechnik und Industrieautomation GmbH
Ludwig-Erhard-Str. 6
D-50129 Bergheim-Glessen

CE

Konformitätserklärung
Declaration of conformity
Déclaration de conformité

Die nichtselbsttätige Waage
The non-automatic weighing instrument
L'instrument de pesage à fonctionnement non automatique

III

Hersteller: *Manufacturer:* Fabricant:	SysTec GmbH
Typ/Modell: *Type/Model:* Type/modèle:	IT6000ET
Nr. der EG-Bauartzulassung: *No of the EC type-approval certificate:* N° du certificat d'approbation CE de type:	D11-09-012

entspricht dem in der Bescheinigung über die Bauartzulassung beschriebenen Baumuster sowie den Anforderungen der folgenden Richtlinien:
Corresponds to the production model described in the EC type-approval certificate and to the requirements of the following EC directives:
Correspond au modèle décrit dans le certificat d'approbation CE de type, aux exigences des directives CE suivantes:

2009/23/EG	***2009/23/EC***	2009/23/CE
2004/108/EG	***2004/108/EC***	2004/108/CE
2006/95/EG	***2006/95/EC***	2006/95/CE

entsprechend den folgenden Normen/Empfehlungen:
in conformity with the following standards:
conforme aux normes suivantes:

EN 45501	OIML R76-1	
EN 61000-6-2	EN 61000-6-3	NAMUR NE21
EN 60950		

Nur gültig mit einer von einer Benannten Stelle erteilten Konformitätsbescheinigung.
Only valid with a Certificate of Conformity issued by a Notified Body.
Seulement valable avec une Attestation de Conformité délivré par une organisme notifié.

Unterschrift *Signature* Signature	Rainer Junglas	**Datum:** *Date:* Date:	**10.05.2012** *May 10, 2012* 10.05.2012

Dipl.-Ing. Rainer Junglas
Geschäftsführer / *General Manager* / Directeur

1.4 Declaration Of Conformity 'ITX000ET External Power Supply

SysTec Systemtechnik und Industrieautomation GmbH
Ludwig-Erhard-Str. 6
D-50129 Bergheim-Glessen

CE

Konformitätserklärung
Declaration of conformity
Déclaration de conformité

Die nichtselbsttätige Waage
The non-automatic weighing instrument
L'instrument de pesage à fonctionnement non automatique

III

Hersteller: *Manufacturer:* Fabricant:	SysTec GmbH
Typ/Modell: *Type/Model:* Type/modèle:	ITx000ET Externes Netzteil *External Power Supply* Bloc d'alimentation externe

entspricht dem in der Bescheinigung über die Bauartzulassung beschriebenen Baumuster sowie den Anforderungen der folgenden Richtlinien:
Corresponds to the production model described in the EC type-approval certificate and to the requirements of the following EC directives:
Correspond au modèle décrit dans le certificat d'approbation CE de type, aux exigences des directives CE suivantes:

2004/108/EG	***2004/108/EC***	2004/108/CE
2006/95/EG	***2006/95/EC***	2006/95/CE

entsprechend den folgenden Normen/Empfehlungen:
in conformity with the following standards:
conforme aux normes suivantes:

EN 61000-6-2 EN 61000-6-3
EN 60950

Nur gültig mit einer von einer Benannten Stelle erteilten Konformitätsbescheinigung.
Only valid with a Certificate of Conformity issued by a Notified Body.
Seulement valable avec une Attestation de Conformité délivré par une organisme notifié.

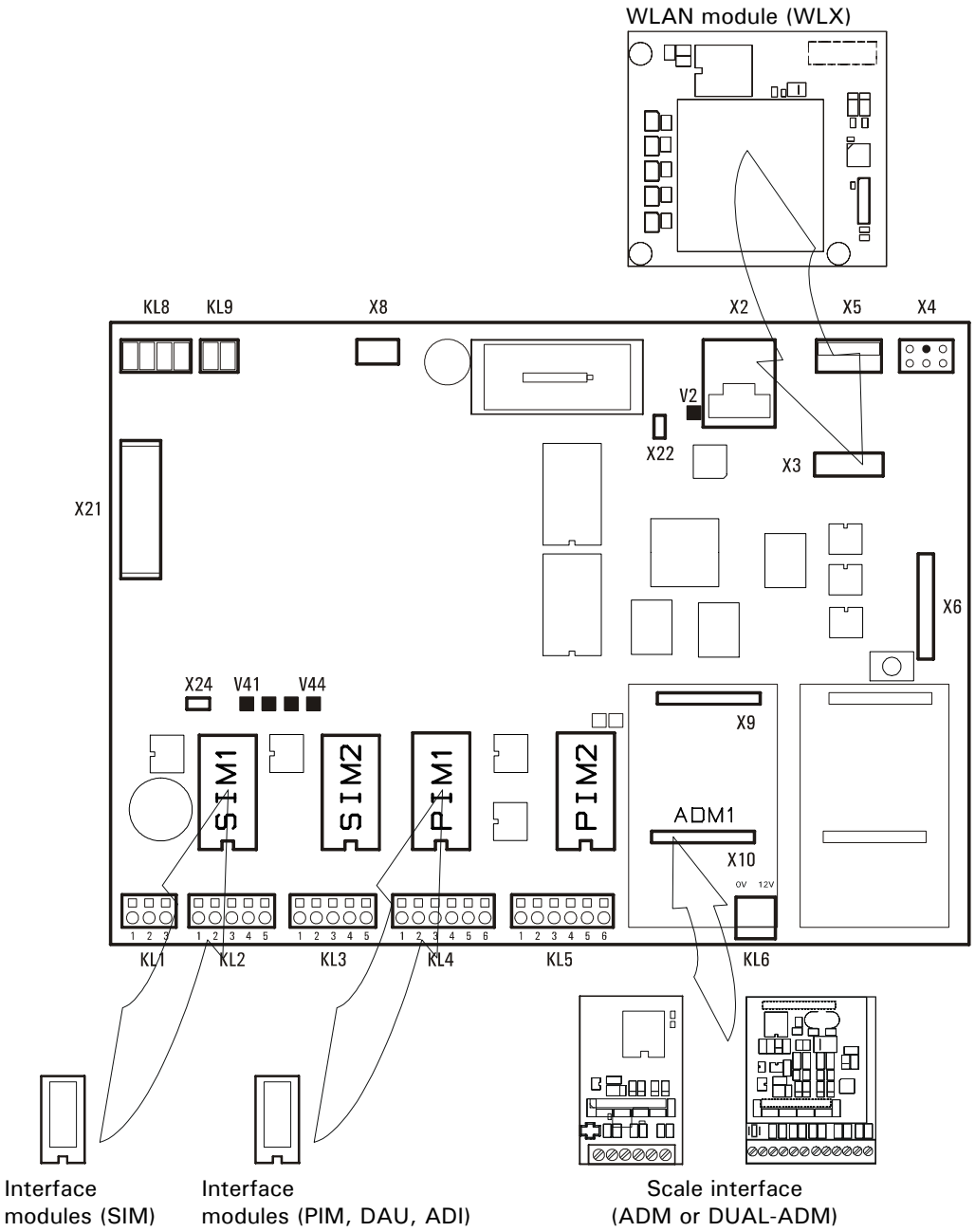
Unterschrift *Signature* Signature	Rainer Junglas	**Datum:** *Date:* Date:	**03.07.2013** *July 03, 2013* 03.07.2013

Dipl.-Ing. Rainer Junglas
Geschäftsführer / *General Manager* / Directeur

2 System Description

This weighing terminal features a modular design with plug-on modules.

Mainboard CPU8000E



For more detailed information on the individual plug-on modules, the TFT display and the power supply refer to chapter 'Installation'.

LEDs on mainboard

LED	Function	
V44	3V3	3.3V CPU logic
V41	5V	5V peripherals
V42	12V	12V peripherals
Ethernet interface:		
V2	LAN	Traffic / connected
ADM scale module:		
V43	ANA:5V	5V for ADM

3 Installation

3.1 Safety Advice

W A R N I N G
Before opening the housing disconnect all power to the instrument. Only connect / disconnect any cables when unit is completely deenergized. Failure to observe this precaution could result in bodily injury!

Notes:

- Transport and storage of electronic components such as boards, EPROMs, etc. must only be made in suitable anti-static ESD bags or cases.
- Shielding measures for the connection of cables must absolutely be adhered to. Insufficient shielding may cause interference and could result in malfunction of the instrument.

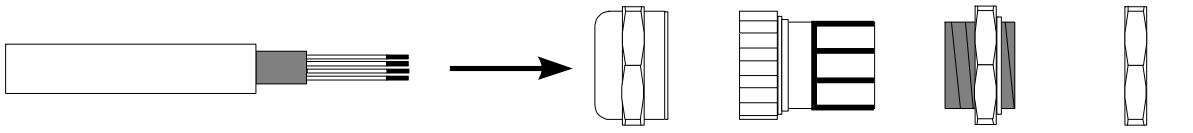
3.2 Setup Of The Instrument

Ambient temperature for operating the unit may range from –10°C to +40°C, at a maximum of 95% relative humidity, without condensation. Exposure to direct sunshine should be avoided.

For wall-mount applications the terminal can be fixed at the wall first, the connection cables can be fitted later with the lid of the housing removed.

3.3 Connection Of Cables

All cables are led into the housing through cable glands.



Cable connection through cable glands:

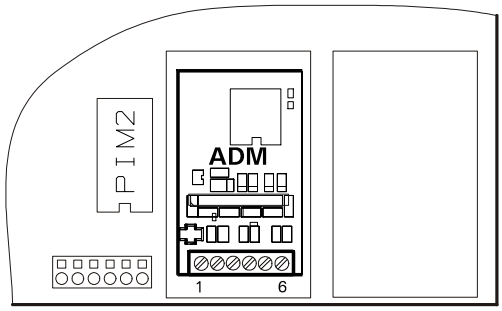
1. Slide compression nut over cable jacket;
2. Slide plastic insert (retainer) over cable jacket until inner end is aligned with cut end of jacket;
3. Unravel shield, bend over retainer and push into retaining comb. Cut wires of shield to length of comb, avoid protruding wires;
4. Insert retainer with cable into bushing;
5. Screw compression nut onto bushing and use wrench to tighten securely.

3.4 Connection Overview

3.4.1 ADM

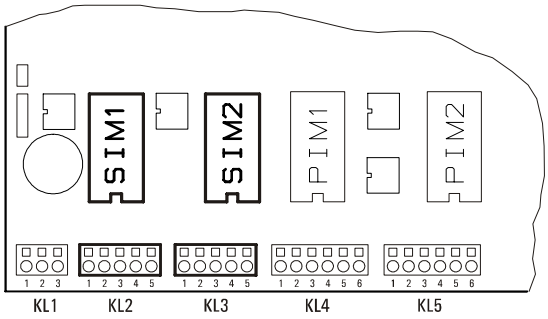
6-wire	
1	+ Excitation
2	– Excitation
3	+ Sense
4	– Sense
5	+ Signal
6	– Signal

4-wire	
1 / 3	+ Excitation
2 / 4	– Excitation
5	+ Signal
6	– Signal

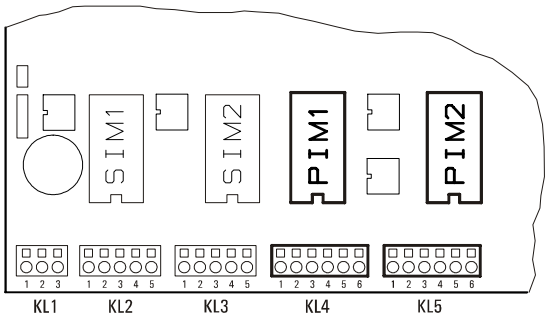


3.4.2 CPU

KL2 Serial interface 1 (COM1) KL3 Serial interface 2 (COM2)			
Terminal#	**RS232**	**20mA**	**RS485 4-wire**
1	TxD	TX_{IN}	Tx A (Tx+)
2	RTS	TX_{OUT}	Tx B (Tx–)
3	RxD	RX_{IN}	Rx A (Rx+)
4	CTS	RX_{OUT}	Rx B (Rx–)
5	Gnd	–	–



KL4 / 5: parallel inputs and outputs 0 - 3			
KL4	**KL5**		
1		0V	
2		+12V	for external switches only!
3		IN0	
4		IN1	
5		IN2	
6		IN3	
	1	In–	for IN0 - IN3
	2	OUT0	
	3	OUT1	
	4	OUT2	
	5	OUT3	
	6	OUT+	for OUT0 - OUT3



Terminal assignment of DAU15			
DAU15 in socket:		**PIM1**	**PIM2**
I+	+ Current output 0/4 - 20mA	KL4.3	KL4.5
I–	– Current output 0/4 - 20mA	KL4.4	KL4.6
U+	+ Voltage output 0/2 - 10V	KL5.2	KL5.4
U–	– Voltage output 0/2 - 10V	KL5.3	KL5.5

Klemmenbelegung bei Einsatz der ADI			
ADI in socket:		**PIM1**	**PIM2**
I+	+ Current input 0/4-20mA	KL5.2	KL5.4
I–	– Current input 0/4-20mA	KL5.3	KL5.5
U+	+ Voltage input 0/2-10V	KL4.3	KL4.5
U–	– Voltage input 0/2-10V	KL4.4	KL4.6

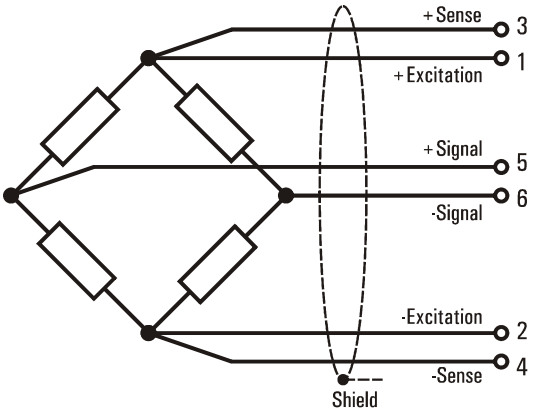
3.5 Connection Of Scales

3.5.1 Connection Of Analog Scale To ADM

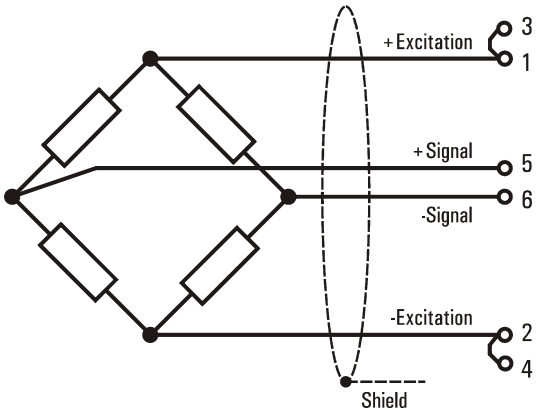
The ADM module provides connection for weighing platforms and loadcells as specified below. One or two scale interface modules can be installed.

- Max. 8 strain gauge loadcells 350 Ω each
- Overall impedance 43 Ω ... 4500 Ω
- W&M approved resolution of 6000d at a max. preload of 80%, internal resolution 524,000d
- Smallest permissible input signal for approved applications: 0.33 µV / e
- Update rate 50-400 updates / second (selectable in Service Mode)
- Loadcell excitation: 5 V ±5% (gated power supply).

Principal schematics of 6-wire and 4-wire strain gauge loadcell:



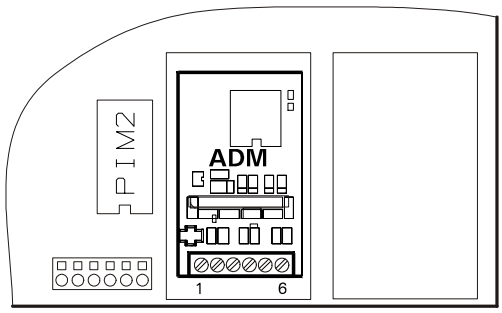
6-wire loadcell



4-wire loadcell

Connection of 6-wire analog loadcell(s) to ADM:

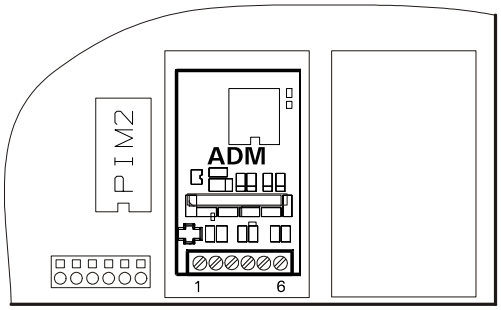
Terminal	Assignment
1	+ Excitation
2	– Excitation
3	+ Sense
4	– Sense
5	+ Signal
6	– Signal



Connection of 4-wire analog loadcell(s) to ADM:

To connect loadcells without sense lines (4-wire connection), two jump leads must be connected between terminal 1 and 3, and between terminal 2 and 4.

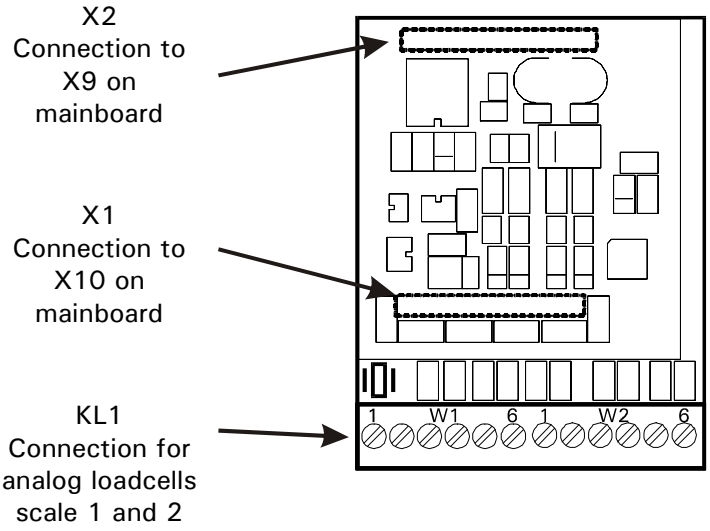
Terminal Assignment	
1 / 3	+ Excitation
2 / 4	– Excitation
5	+ Signal
6	– Signal



3.5.2 Connection Of 2 Scale Bases Via DUAL-ADM

Terminal assignment on DUAL-ADM module

Terminal KL1		Assignment
W1	1	W1 + Excitation
	2	W1 – Excitation
	3	W1 + Sense
	4	W1 – Sense
	5	W1 + Signal
	6	W1 – Signal
W2	1	W2 + Excitation
	2	W2 – Excitation
	3	W2 + Sense
	4	W2 – Sense
	5	W2 + Signal
	6	W2 – Signal



Connection of 4-wire loadcell:

To connect loadcells without sense lines (4-wire connection), two jump leads each must be connected at terminal strip KL1 between terminal 1 and 3 as well as 2 and 4 (scale 1 and 2).

For operation with two scales please note:

The DUAL-ADM module has one A/D converter which is either connected to scale 1 or scale 2 and which does not permit reading of the two scales in parallel (switching mode only). A summing mode is not possible. On switching from one scale to the other, new measuring values are determined for digital filtering and the motion detector, thus it takes approx. 1 sec after switching until a stable weight can be displayed.

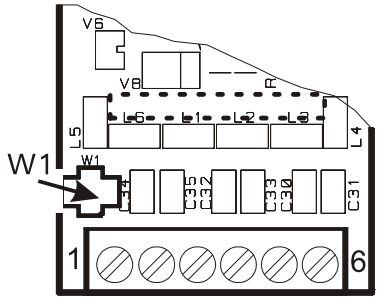
W A R N I N G
The weighing terminal may only be installed in non-hazardous (safe) area. Connection of Ex-i loadcells installed in hazardous area must be made via suitable zener barriers of type 10ZUB483!

For the installation of connection cables for analog weighing platforms please follow the recommendations listed below:

- Only use suitable loadcell cable,
  (e.g. SysTec order-No. 10KAB214, 3 x 2 x 0.75mm², shielded)
  Nominal voltage of cable ≥250V.
  Unsuitable loadcell cable may affect accuracy.
- The shield of the loadcell cable must be connected all around the cable in the cable gland of the weighing terminal (see also chapter 'Installation' / 'Connection Of Cables'). If an extension of the loadcell cable is required use only metal junction boxes and cable glands. The shield on both sides must be connected in the same way as at the terminal. Loadcells and/or weighing platforms, junction boxes and the terminal must be included in the potential equalization of the components of a weighing system. Depending on the situation on site this may require the installation of a separate earth lead of appropriate diameter (e.g. 16mm²) in parallel to the loadcell cable.
- Distance between loadcell cables and power lines: ≥0.5m. Loadcell cables to be installed in grounded metal conduits, metal hoses or metal cable trays.
- Maximum length of connection cable between weighing platform and weighing terminal: 200m
- If tension load is applied to loadcells instead of compression load, connection for +Signal and –Signal must be transposed.

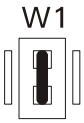
3.5.3 Sealing Of Calibration Parameters

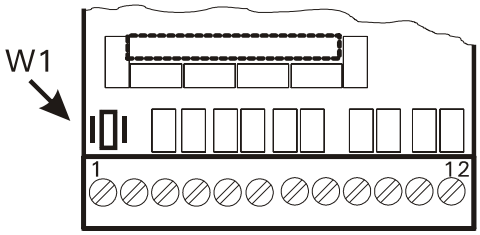
By means of the jumper W1 the calibration parameters stored in EEPROM can be protected against unauthorized modifications:



ADM

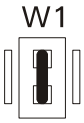
Calibration parameters protected



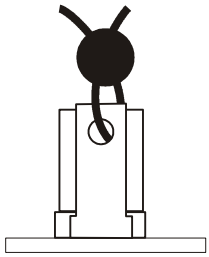


DUAL-ADM

Calibration parameters of both scales protected



If required for W&M approved and stamped systems, the position of the jumper W1 can be sealed with thread and lead seal:

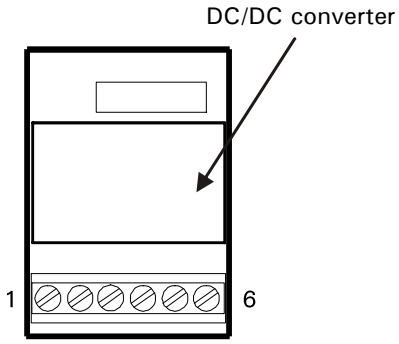


3.5.4 Connection Of Digital Mettler-Toledo Scale Bases With IDNet Interface

The **IDN** module (**IDN**et interface module) permits the connection of Mettler-Toledo scale bases with IDNet interface.

The IDN module supplies a current of 150mA max. at 12VDV for the supply of the IDNet scale base.

IDN interface module



Terminal KL1
Interface for scale base

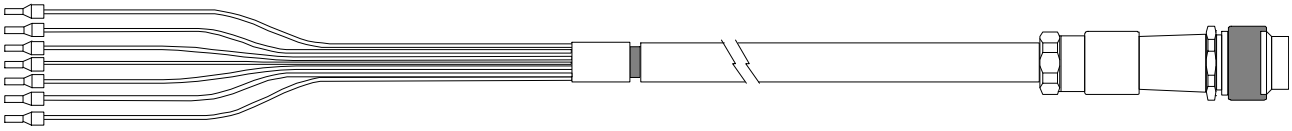
Terminal KL1	Signal	Function
1	TxD−	− transmit line 20 mA CL
2	TxD+	+ transmit line 20 mA CL
3	RxD−	− receive line 20 mA CL
4	RxD+	+ receive line 20 mA CL
5	0 V	0 V supply voltage
6	+12 V (150mA)	+12V supply voltage

IDNet understructures which operate on 12VDC power supply (e.g. TBrick) are connected with the IDNet scale cable 16KAB002.

For IDNet scale bases with 12V and 32V power supply (e.g. K-Cell) the external power supply unit IDNet-PSBox (10OPT124) is required. The connection is made with the IDNet scale cable 16KAB004.

Standard cable for the connection of digital weighing platforms (approx. 0.3m):

IDNet connecting cable for Mettler-Toledo scale bases
Art.-No. 16KAB002 / 16KAB004 (ST.2300.0064)



Terminal Strip KL1	Signal	Color	Pin Assignment (12-pin Binder Connector)
1	TxD-	yellow	J
2	TxD+	green	A
3	RxD-	white	F
4	RxD+	brown	D
5	0 V	pink	H
6	+12 V	gray	C
	+ 32V	blue	B

Note:

The blue wire of cable 16KAB002 (for IDNet scale bases with 12V supply) is not used and must be cut directly at the cable gland.

The pink and blue wires of cable 16KAB004 (for IDNet scale bases with 12V and 32V supply) are fitted with crimp contacts for connection to the IDNet-PSBox.

3.5.5 Interface For Digital Force Transducers with RS485 Interface (DWB)

The **DWB module** (**D**igital **W**eighing **B**oard) permits the connection of one digital force transducer operating on 12VDC power supply and communicating with the weighing terminal via RS485 2-wire or 4-wire network.

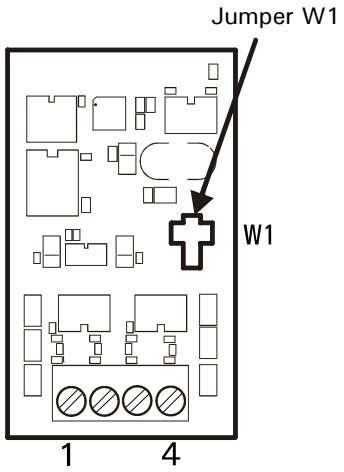
At present, scale bases and loadcells are supported as follows:

- Sartorius series IS weighing platforms
- HBM series C16i loadcells
- Flintec series RC3D loadcells

Calibration data are stored powerfail-safe in a serial EEPROM on the DWB module. By means of the jumper W1 these data can be protected against unauthorized access.

One or two DWB modules may be installed. If only one DWM is used, the remaining free socket can be used for an ADM board to connect a scale base with up to 8 analog loadcells (350 Ω each).

DWB interface module

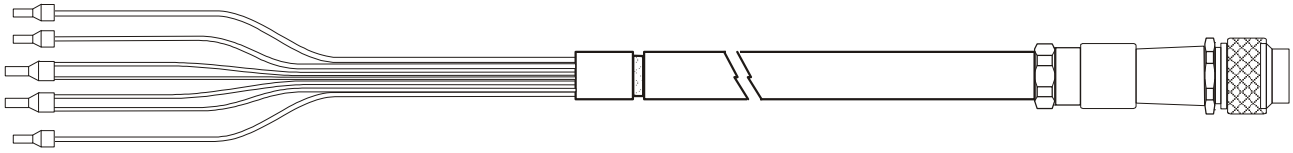


Terminal strip KL1
connection of
digital scale base

Terminal KL1	Signal RS485 4-wire	Signal RS485 2-wire	Assignment
1	Tx A (Tx+)	A (Tx+ / Rx+)	+ transmit line RS485
2	Tx B (Tx—)	B (Tx— / Rx—)	— transmit line RS485
3	Rx A (Rx+)	—	+ receive line RS485
4	Rx B (Rx—)	—	— receive line RS485

Standard cable for the connection of digital Sartorius weighing platforms series IS (approx. 0.3m):

RS485 2-wire connecting cable for Sartorius weighing platforms
Art.-No. 16KAB001 / ST.2300.0098



Terminal KL1 (DWB)	Signal	Color	Pin assignment (12-pin Amphenol connector)
1	Tx+ / Rx+	green	L
2	Tx- / Rx-	yellow	A
—	Prog	blue *)	F

Terminal KL6 (CPU)	Signal	Color	Pin assignment (12-pin Amphenol connector)
0V	Gnd	brown / white	K + J + E
12V	+12V	gray / pink	G + M

*) Note: The blue wire (PROG) is not used and should be cut directly at the cable gland.

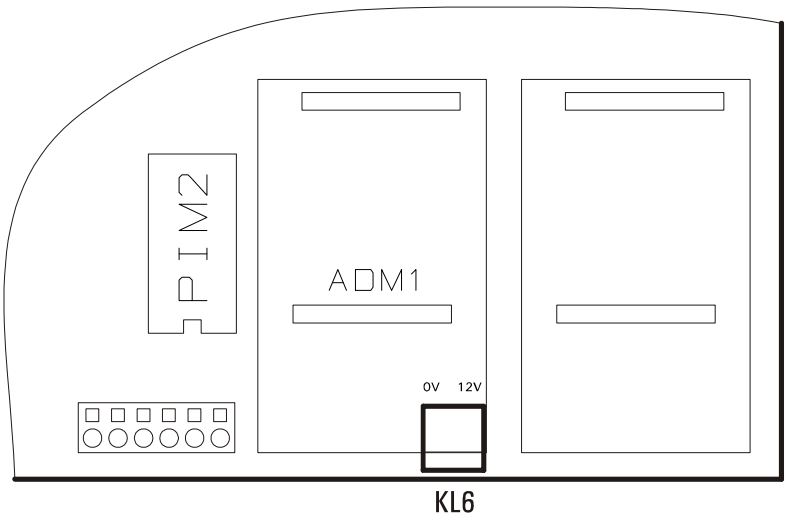
3.5.6 Connection Cables For Digital Force Transducers

Unsuitable cable may cause loss of data. For the installation of connection cables for **digital** weighing platforms please follow the recommendations listed below:

- Only use suitable connecting cable (data cable), e.g. 6 x 0.25 mm² shielded, SysTec order-No. 10KAB216, or data cable supplied by the manufacturers of scale base.
- Nominal Voltage of cable ≥250V.
- Connect shield of cable at **both sides,** at cable gland of terminal and at scale base and/or extension cable. Install appropriate equipotential bonding if difference of potential is experienced.
- Distance between data cables and power lines: ≥0.5m. Data cables to be installed in grounded metal conduits, metal hoses or metal cable trays.
- Maximum length of connection cable between weighing platform and terminal: 15m.

3.5.7 Auxiliary Power Supply For Digital Force Transducers

An auxiliary power supply of 12VDC for digital force transducers is available at terminals KL6.



Assignment terminal strips KL6

12V	12VDC (500mA in total) incl. current drawn at KL1
0V	0V (12)

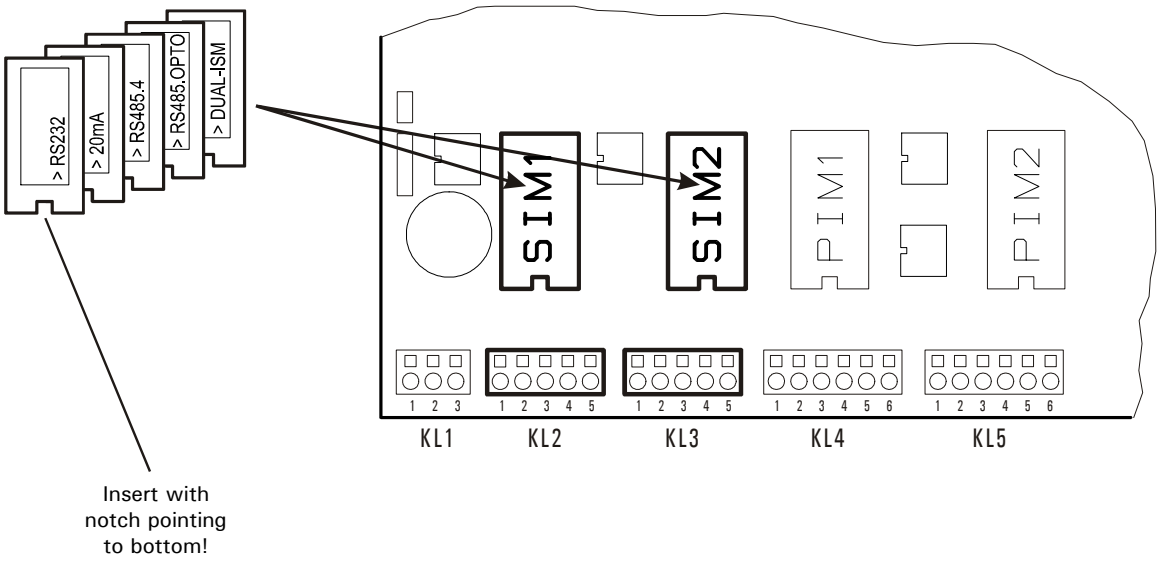
3.6 Connection Of Serial Interfaces (SIM And DUAL-ISM)

The following plug-on modules for serial interfaces and an incremental sensor can be installed in the SIM sockets:

- 'SIM RS232' (RS232 interface)
- 'SIM 20mA' (20mA current loop interface)
- 'SIM RS485.4' (RS485 4-wire interface)
- 'SIM RS485.OPTO' (RS485 4-wire optoisolated interface)
- 'DUAL-ISM' (to connect dual-channel pulse wheel)

Please note: When a 20 mA CL interface is used, receiver and transmitter of the weighing terminal are always passive, i.e. supply voltage for the current loops must be provided by the connected peripheral device.

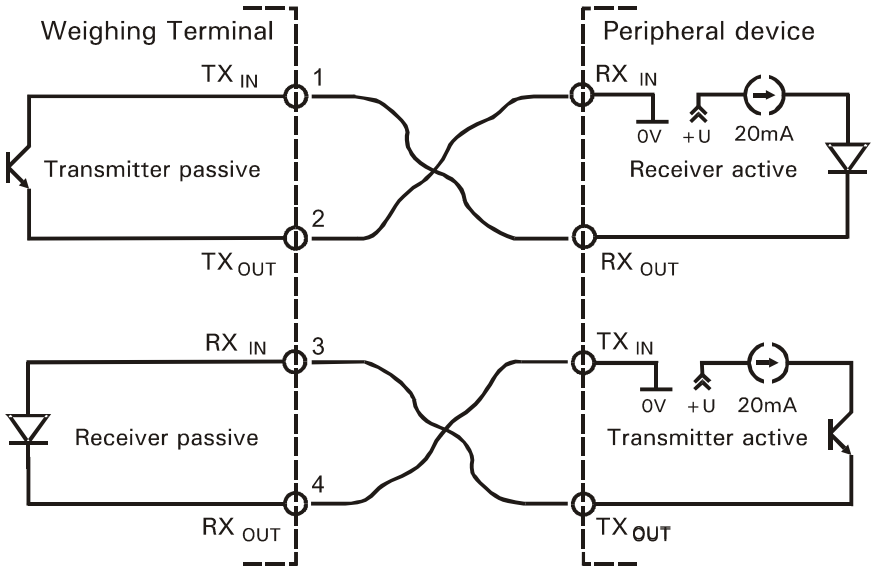
Connection of serial interface on the mainboard:



Terminal assignment:

Serial interface 1 (COM1): KL1 Serial interface 2 (COM2): KL2			
Terminal#	**RS232**	**20mA**	**RS485 4-wire**
1	TxD	TX_{IN}	Tx A (Tx+)
2	RTS	TX_{OUT}	Tx B (Tx—)
3	RxD	RX_{IN}	Rx A (Rx+)
4	CTS	RX_{OUT}	Rx B (Rx—)
5	Gnd	—	—

Principal circuit diagram of the 20mA current loop interface:



For the installation of connection cables for serial interfaces please follow the recommendations listed below:

- Install data cables to prevent capacitive or inductive interference from other cables, machines and/or electrical devices that could interrupt data transmission and lead to loss of data.
- For maximum suppression of interference, shield should be grounded on both sides.
- If fluctuation of the earth potential is experienced, this can cause an equalization current flowing over the shield. In this case a separate earth lead of appropriate diameter for potential equalization is required.
- Non-factory made cables must comply with the following specification:

Triple twisted pair plus shield, e.g. LIYCY 3 x 2 x 0.14mm² or LIYCY 3 x 2 x 0.25mm², shield grounded on both sides.

Resistance	≤ 125 Ω/km
Gauge	≥0.14 mm² up to 200m, ≥0.25 mm² up to 1200m
Capacitance	≤ 130 nF/km
Length RS232	max. 15m
Length RS485	max. 1200m
Impedance RS485	approx. 150 Ω
Nominal voltage	≥ 250V

For RS485 connections please note:

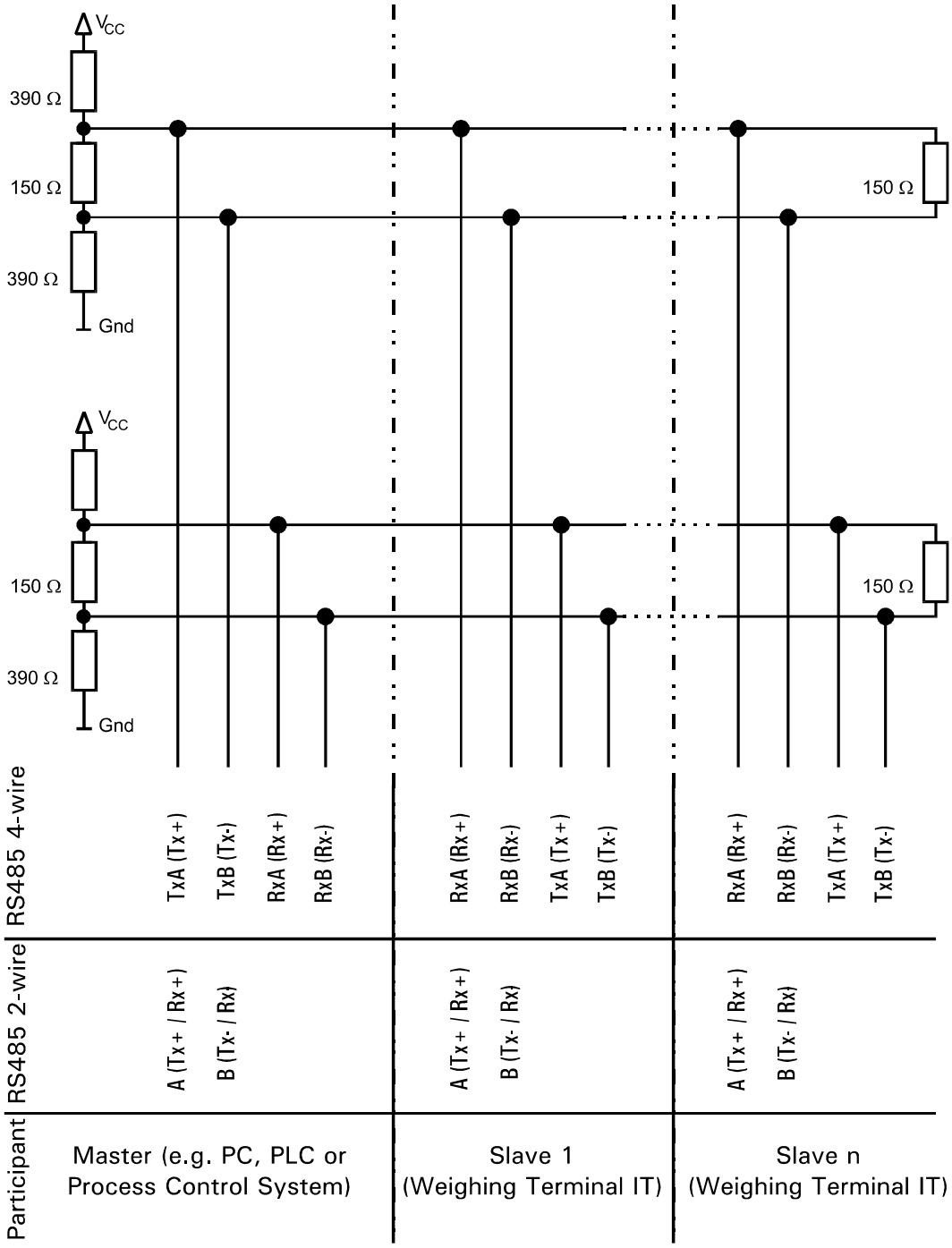
Terminal assignment: Some manufacturers of components with RS485 interface do not refer to the terminals TX+ and RX+ as 'A', but 'B' instead (correspondingly, the terminals TX– and RX– are not referred to as 'B', but 'A').

Cables: Use only twisted pair cables with a characteristic impedance of approx. 150 Ω.

Termination resistors: In order to prevent reflection (baud rate 19200 Baud or higher, and/or cable longer than 20 m) it is recommended to install termination resistors R_{Term} = 150 Ω on both ends of the cable.

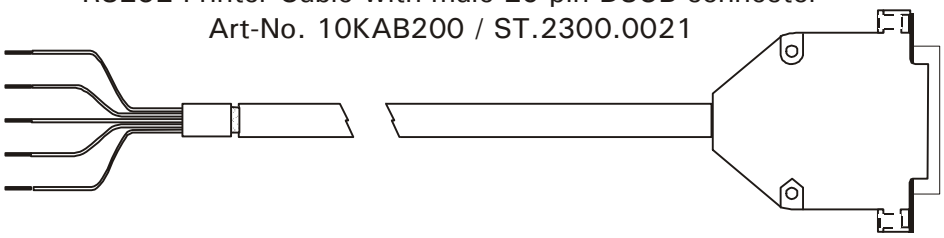
Pull-up / pull-down resistors: When termination resistors are used, also pull-up and pull-down resistors must be installed at the master (see also following schematic).

RS 485 network with termination, pull-up and pull-down resistors:



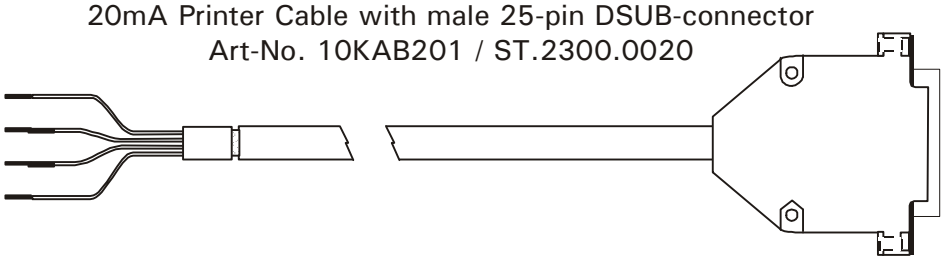
3.6.1 Standard Cables For Serial Interface

RS232 Printer Cable with male 25-pin DSUB-connector
Art-No. 10KAB200 / ST.2300.0021



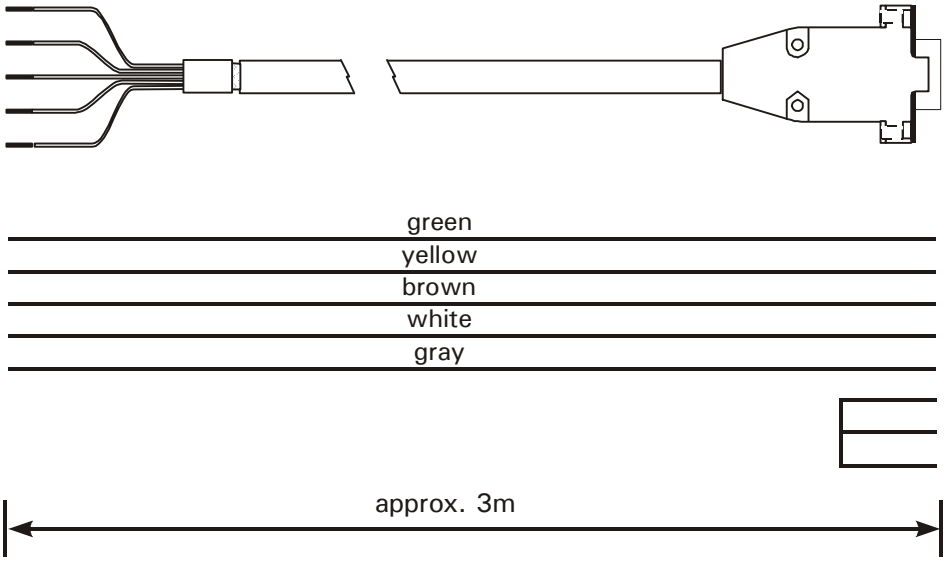
Terminal			Printer	
TxD	1	green	3	RxD
RTS	2	yellow	5	CTS
RxD	3	brown	2	TxD
CTS	4	white	20	DTR
Gnd	5	gray	7	Gnd

20mA Printer Cable with male 25-pin DSUB-connector
Art-No. 10KAB201 / ST.2300.0020



Terminal			Printer	
TX_{IN}	1	green	23	RX_{OUT}
TX_{OUT}	2	yellow	25	RX_{IN}
RX_{IN}	3	brown	24	TX_{OUT}
RX_{OUT}	4	white	17	TX_{IN}

RS232 Data Cable with female 9-pin DSUB-connector
Art-No. 10KAB202 / ST.2300.0019



Terminal			PC	
TxD	1	green	2	RxD
RTS	2	yellow	8	CTS
RxD	3	brown	3	TxD
CTS	4	white	7	RTS
Gnd	5	gray	5	Gnd
			1	
			4	
			6	

approx. 3m

3.7 Connection Of Single-/Dual-Channel Pulse Wheel (DUAL-ISM)

A pulse wheel (rotary pulse transmitter) can be connected to the indicator by means of a dual-channel (DUAL-ISM) interface (**I**mpulse **S**ensor **M**odule) plugged into one of the sockets SIM1 or SIM2.

At the terminal strip KLx dual-channel incremental sensors (pulse wheels) can be connected that operate on 10VDC and have PNP or push-pull outputs.

When a single-channel sensor is connected, terminal KLx.4 remains free.

Terminal assignment of DUAL-ISM

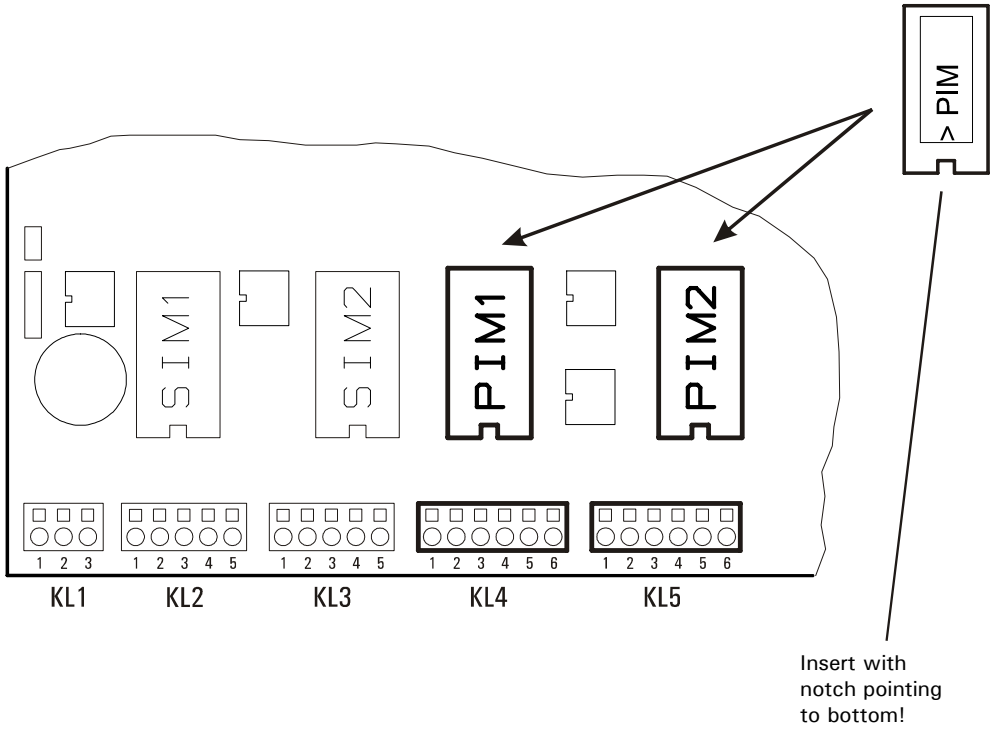
KLx	Assignment	Designation	Comment
1	10V	Supply for pulse wheel	100mA max.
2	5V	–	
3	CHA	Pulse wheel channel A	Off = 0...3V On = 7...10V
4	CHB	Pulse wheel channel B	Off = 0...3V On = 7...10V
5	GND	GND supply for pulse wheel	

3.8 Connection Of Parallel I/Os (PIM)

The parallel input/outputs on the mainboard can be activated by inserting plug-on modules. Each module provides drivers for two optoisolated inputs and two optoisolated outputs.

Rating of outputs: 12-24VDC; 100mA max.
Current consumption of inputs: 7mA max. @ 12-24VDC.

Position and assignment of parallel inputs/outputs on mainboard:



Terminal assignment KL4 / 5: parallel inputs and outputs 0 - 3			
KL4	KL5		
1		0V	
2		+12V	for external switches only!
3		IN0	
4		IN1	
5		IN2	
6		IN3	
	1	In–	for IN0 - IN3
	2	OUT0	
	3	OUT1	
	4	OUT2	
	5	OUT3	
	6	OUT+	for OUT0 - OUT3

Note: The internal 12 VDC supply (terminal row KL4, terminal #2) may be used to connect switches (max. 100mA) and push buttons to the digital inputs. External devices connected to the digital *outputs* must always be supplied from an external 24 VDC power supply.

For the installation of connection signal cables please note:

Install I/O cables to prevent capacitive or inductive interference from other cables, machines and/or electrical devices that could affect input/output signals and lead to malfunction and/or dangerous operational conditions.

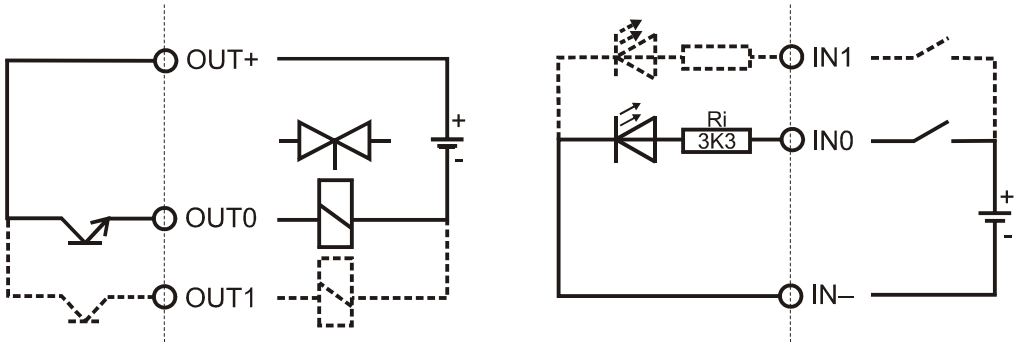
Cables must comply with the following specification:

- shielded multicore cables, shield connected to ground on both sides
- flexible wires with wire end ferrules and plastic collar
- Resistance ≤125 Ω/km
  Gauge 0.2 mm^2 to 0.5 mm^2 max.
  Capacitance ≤130 nF/km
  Length max. 15 m
  Nominal voltage ≥250 V

Note:

- For maximum suppression of interference, shield should be grounded on both sides.
- If fluctuation of the earth potential is experienced, this can cause an equalization current flowing over the shield. In this case a separate earth lead of appropriate diameter for potential equalization is required.

Principal schematics

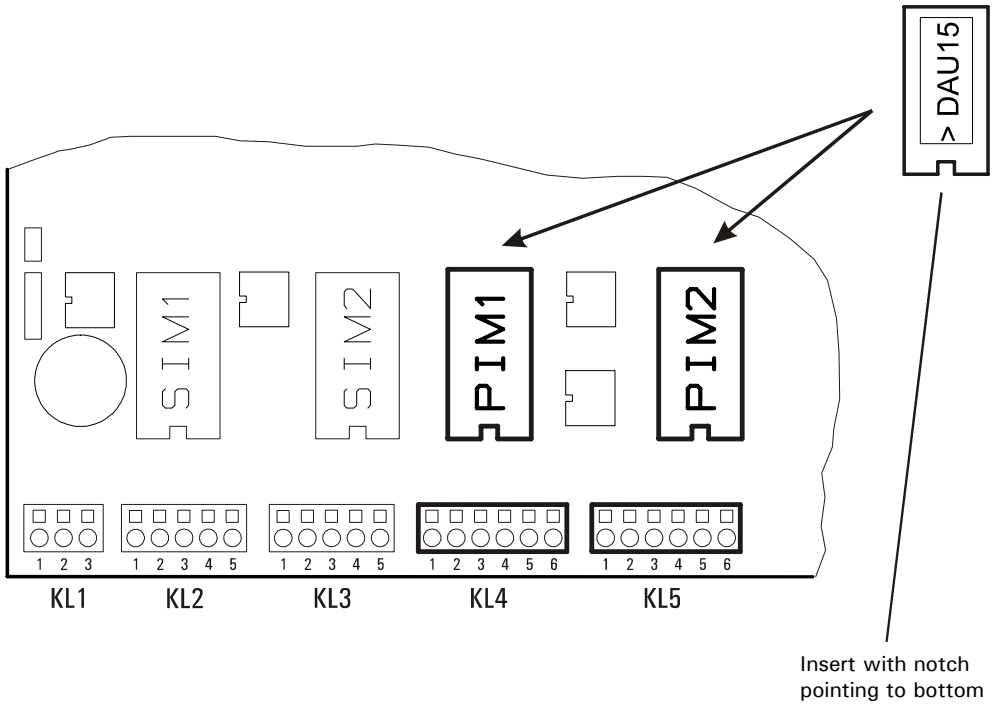


Parallel output Parallel input

3.9 Connection Of 15-Bit Analog Output (DAU15)

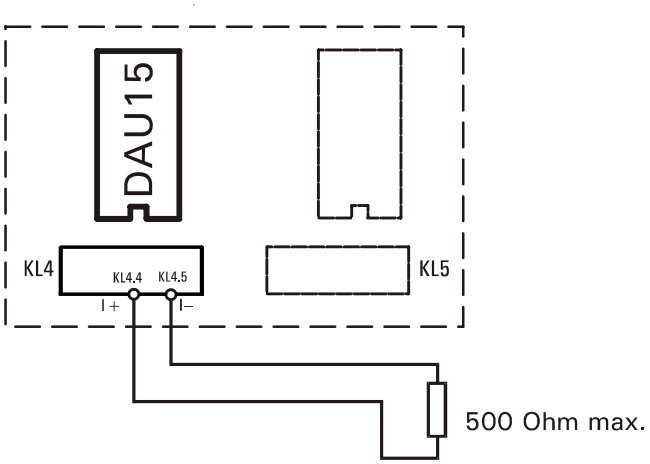
For the output of gross or net weight as analog 15-bit signal a plug-on module (DAU15) can be inserted instead of a parallel driver module in the socket PIM1 or PIM2. The output signal has a resolution of 15 bit (32768 steps). The module can be configured in the Service Mode to 0/2 - 10V or 0/4 - 20mA. The output of the DAU15 module is active and potential free.

Installing the DAU15 in a PIM socket om the mainboard



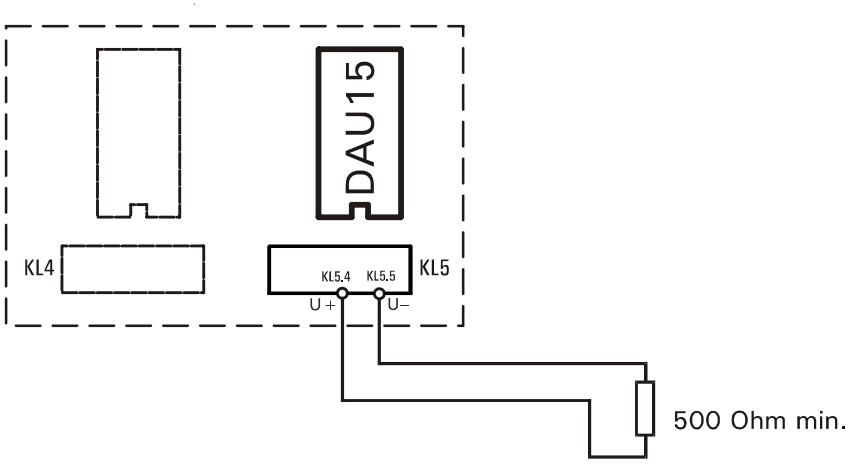
Terminal assignment of DAU15:			
	DAU15 in socket:	**PIM1**	**PIM2**
I+	+ Current output 0/4 - 20mA	KL4.3	KL4.5
I–	— Current output 0/4 - 20mA	KL4.4	KL4.6
U+	+ Voltage output 0/2 - 10V	KL5.2	KL5.4
U–	— Voltage output 0/2 - 10V	KL5.3	KL5.5

Example for current output 0/4 - 20 mA (DAU15 in socket PIM1):



The impedance of the connected load must not exceed 500 Ω.

Example for voltage output 0/2 - 10 V (DAU15 in socket PIM2):

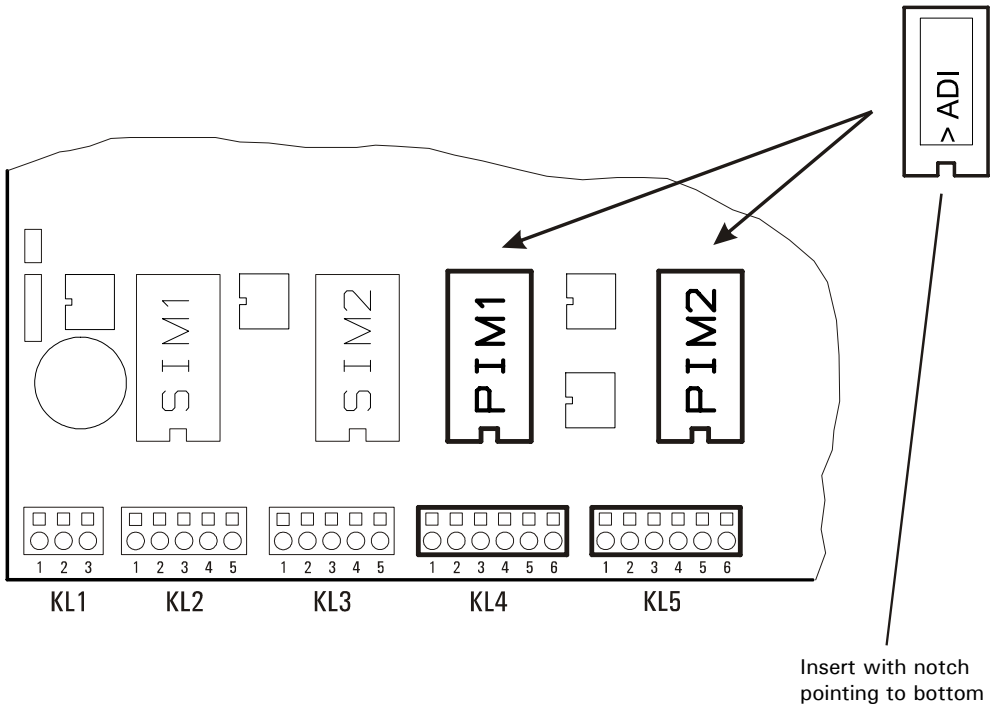


The impedance of the connected load must be equal or greater than 500 Ω.

3.10 Connection Of 15-Bit Analog Input ADI

For the measurement of analog voltages or currents the plug-on module ADI can be installed in socket PIM1 or PIM2 instead of the parallel I/O module PIM. The input signal has a resolution of 15 bit (32768 steps). The input of the ADI module is potential free.

Installing the ADI in a PIM socket on the mainboard



Terminal assignment of ADI:			
	ADI in socket:	**PIM1**	**PIM2**
I+	+ Current input 0/4-20mA	KL5.2	KL5.4
I–	— Current input 0/4-20mA	KL5.3	KL5.5
U+	+ Voltage input 0/2-10V	KL4.3	KL4.5
U–	— Voltage input 0/2-10V	KL4.4	KL4.6

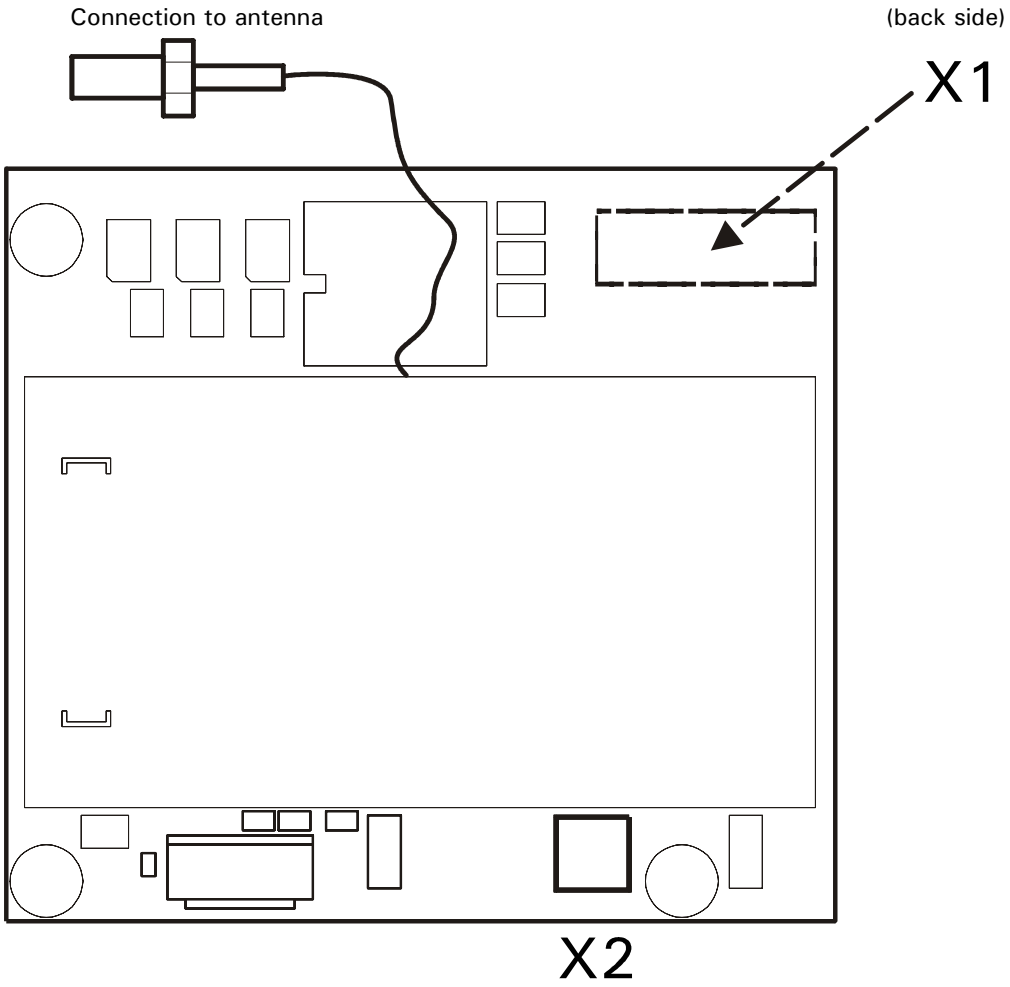
The impedance of the current input is 24 Ω.

The impedance of the voltage input is 105 kΩ.

3.11 Connection Of WLAN Module WLX

For the WLAN connection (wireless network) the WLX module is plugged onto the main board and the antenna is connected.

Connections on WLX module



WLX	Socket mainboard
X1	X3
X2	Reset

Note: Use of WLX module (WLAN) and Ethernet connection (LAN) is NOT possible at the same time.

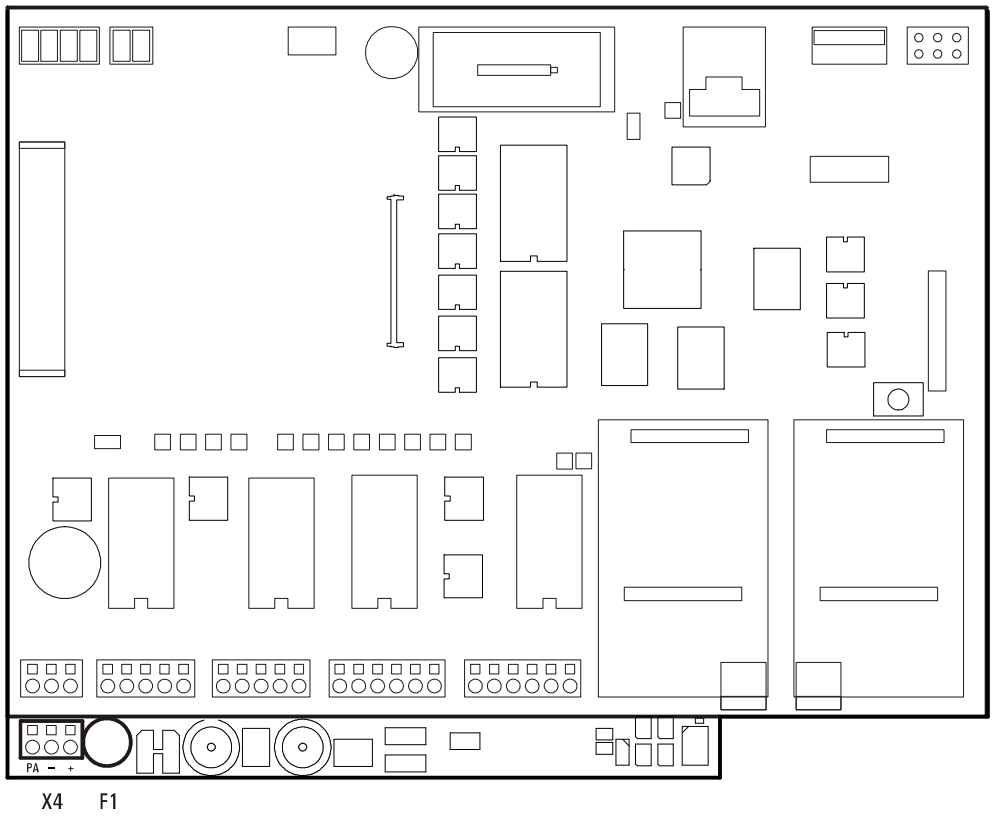
3.12 Connection To Power Supply 12 – 30 VDC

IT6000ET is intended for connection to a supply voltage of 12 VDC (–15 %) to 30 VDC (+10 %).

The external voltage is connected at terminal X4 on the basic board PTA (Power-Supply-Touch-Adapter). This board contains a DC/DC converter (30W, 12 - 30 VDC input / 12 VDC output), the connection to the touch screen with LVDS converter and the monitoring of the battery charge state. The board has a fused input (2A T). A diode serves as protection against polarity reversal.

Terminal assignment X4

X4	Assignment
PA	Gnd (housing)
–	0 VDC
+	+12VDC to +30 VDC



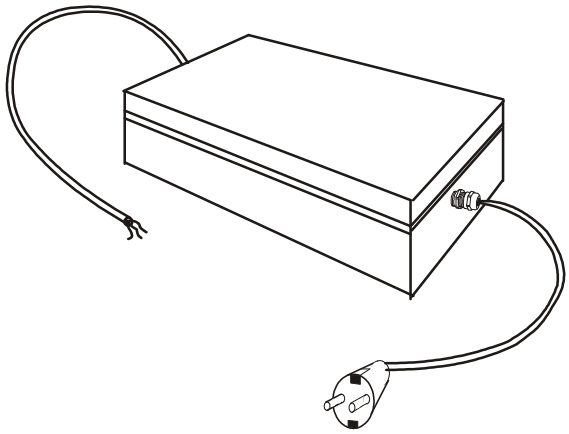
3.13 Disable On/Off Switch

The jumper X24 on the mainboard determines the function of the on/off switch, see also section 'System Description':

- Jumper inserted: On/off switch disabled, when connected to power supply the terminal starts immediately.
- Jumper removed: The terminal only starts after pressing the on/off switch.

3.14 ITX000ET External Power Supply 110 – 240 VAC (T8PWS001)

'ITX000ET Externes Netzteil' (external power supply) is suitable for the supply of the IT6000ET weighing terminal. For connection to the 110-240 VAC mains supply it has a line cord with safety plug. The output voltage of 12VDC is available at a 2-core cable of 1m length with free ends and can be connected at the input terminals X4 of the IT6000ET weighing terminal.



Technical data and assignment:

Input:	
Input voltage:	110-240 VAC / 47-63 Hz; 0,4-0,2 A
Connection:	Line cord of 2.5m length with safety plug
Output:	
Output voltage:	12 VDC; 2.0 A
Connection:	2-core cable of 1m length, color code: brown: +12 VDC white: 0 VDC

Safety advice:

- Input voltage of the unit must comply with local mains supply: 110–240 VAC / 47-63 Hz.
- The mains supply of the unit should not be used at the same time for machines or equipment that can cause interference (e.g. motors, relays, heatings, etc.). Even short spikes or interruptions may affect the function of the unit or cause damage. An uninterruptable power supply (UPS) can prevent problems of this nature.
- Mains supply is made via a factory-installed line cord of 2.5m length with safety plug. Make sure that wall outlet is correctly grounded!
- The wall outlet must be installed close to the unit and must be easily accessible!
- The device uses the short-circuit / overcurrent protection of the on-site mains supply.

W A R N I N G
Parts of the power supply unit -in particular the heat sinks- are directly connected to dangerously high voltages! A defective power supply unit cannot be repaired it can only be replaced. Disconnect all power to the unit before servicing!

3.15 External Connections

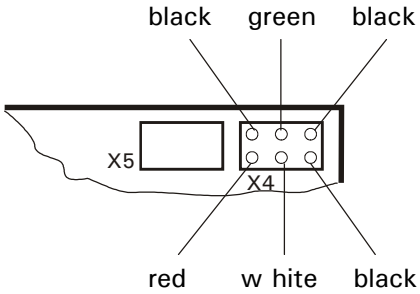
3.15.1 USB Connection

The SysTec 'USB memory stick, internal', No. 19OPT601 plugs directly into X5 on the mainboard. Optionally on the outside with one of the following adapters:

- 18OPT500, USB kit, USB socket protected to IP67, the counter nut must be firmly tightened;
- 10KAB431, patch cable 0.15m with cable gland and USB socket type A;
- 10KAB432, patch cable 3m with cable gland and USB socket type B.

Note:

- Internally the cable plugs into connector X4 on the mainboard. When inserting the connector, observe the color coding as shown bellow:



- When the external USB connection is used, the internal one (X5 on the mainboard) must not be used.

For the time being, the weighing terminal supports either a USB keyboard or a USB memory device.

USB keyboard	Terminal	USB keyboard	Terminal
F1-F6	**F1-F6**	F10	
Tab		F11	
F8		F12	
F9			

3.15.2 Ethernet Connection

Connection to a local 10/100MBit Ethernet network is made via a connecting cable with RJ45 connector (internal connection at X2 on main board):

- 10KAB405, Ethernet cable 5m with cable gland and RJ45 connector;
- 10KAB410, Ethernet cable 10m with cable gland and RJ45 connector;
- 10KAB420 + 10KAB421, Ethernet cable with cable gland and RJ45 connector, customized cable length.

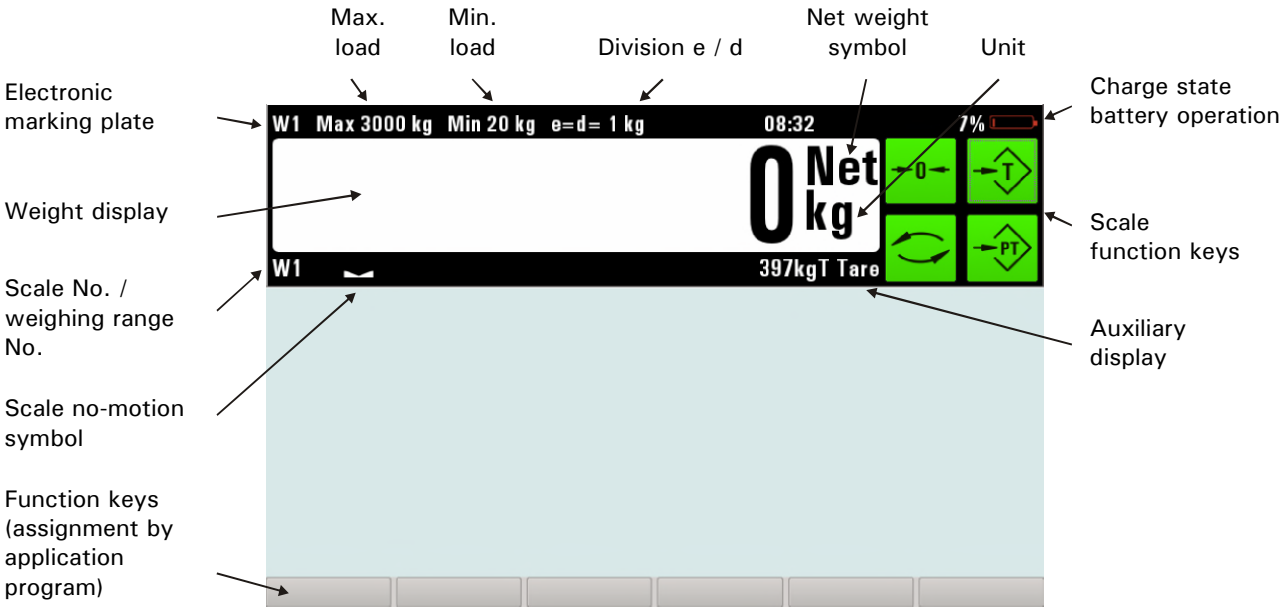
Note:

- When the external Ethernet connection is used, the WLAN module WLX cannot be connected at X3.
- Max. permissible cable length without repeater (hub/switch) is 80m

If customer-assembled cables are used, please observe the following advice:

- Strip approx. 10mm of cable jacket where cable gland is to be installed;
- Run cable through cable gland until shield of cable has reached the contact position;
- Tighten cable gland.

4 Weight Display And Scale Function Keys



Please note that 'key' refers to the corresponding sensor field of the currently displayed template, in the same way 'pressing a key' is to be understood as touching the respective field of the touch panel.

Scale Function Keys

Set Zero Key to set the displayed scale to zero (only within zero setting range, selectable in calibration mode). *1

Key to switch auxiliary display between tare weight / gross weight / bargraph / weight storage.

Tare Key for alternately taring of currently displayed weight or clearing the tare weight. *1

Tare entry key to enter preset tare in the tare line, the value is applied after confirmation with the Enter-key. *1

*1 Function can be disabled in application program.

Electronic Marking Plate (only for single- and dual-range and two-interval scales)

Scale-No.	W1 ... W8	No. of scale selected via Scale Select Key.
Max Load	e.g.: Max 3000kg	Maximum load (without additive tare), selectable in calibration mode.
Min Load	e.g.: Min 20kg	Permissible minimum load.
Division e / d	e.g.: e=d=1kg	Approved division e and display graduation d (in most cases e = d).

Weight Display

Scale-No. / No. Of Weighing Range	W1 ... W8 W1.1 ... W8.3	No. of scale selected via Scale Select Key partial weighing range for multiple-range scales.
No-Motion Symbol		Settled weight (printing / storing possible).
Gross Weight Or Net Weight	e.g. 1250 e.g. 650 Net	Switching from gross weight to net weight with Tare-key.
Net Weight Symbol	Net	Scale is tared.
Unit	e.g. kg	Weight unit, selectable in calibration mode.

Auxiliary Display (switchable via Display Select Key)

Tare	**12,9kgT**	Display of tare weight
Gross	**1000kg**	Display of gross weight
	3700 kg	Gross weight bargraph (zero to max load)
Approved weight storage		W&M approved data archive (see chapter 'Data Archive')
Firmware information		Show details of firmware version

Example for firmware information

4.1 General Operation

Back to previous program step or previous line

Scrolling in records / columns of tables,
scrolling of lines right / left in edit functions

ABC... Switching to layout of alphanumeric keyboard

123... Switching to layout of numeric keyboard

Shift-key for capital letters

Delete characters

Enter-key

Confirmation of Entry / Choice of Function

Every entry or choice of parameter or function must be confirmed with the Enter-key, even if this is not explicitly stated in the following text. After pressing the Enter-key the program is continued in the next step.

4.2 Operation Of Scale Functions

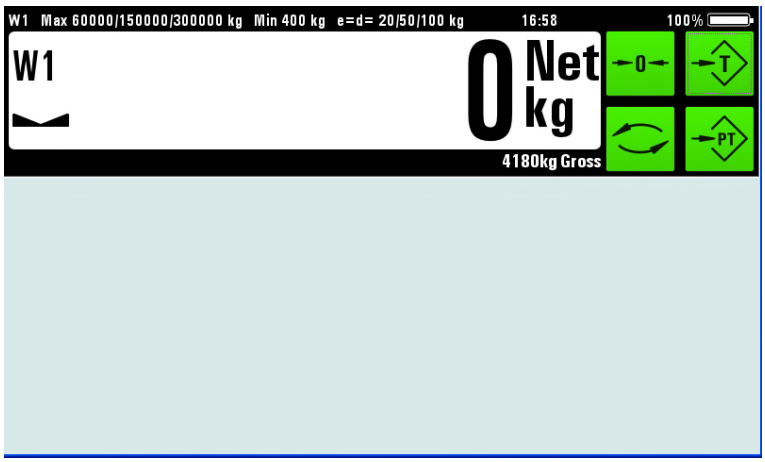
Preset Tare (PT)

After pressing the PT-key, the template for numeric inputs is displayed and a tare value can be entered and confirmed with the Enter-key.

Indication of net weight in the main display and gross weight in the auxiliary display.

By pressing the Tare-key the tare is cleared and the main display returns to the indication of the gross weight.

Tare Balancing



By pressing the Tare-key, tare balancing is executed. By pressing the Tare-key once more the display returns to gross weight.

5 Service Mode

5.1 General

The Service Mode is a program for configuration, calibration and hardware test of the weighing terminal. Also, data can be backed up onto a PC.

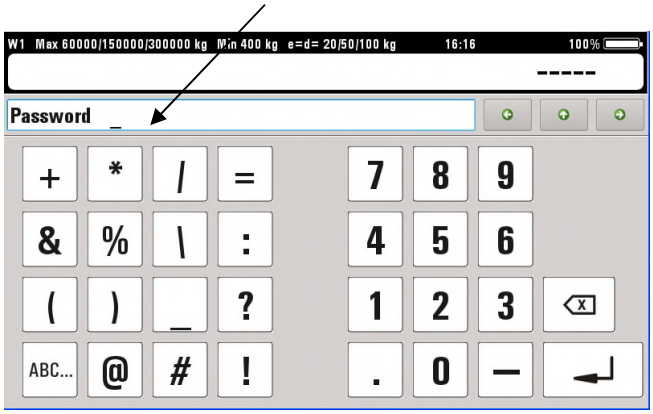
Notes:

- This weighing terminal and its associated equipment must be installed, adjusted and maintained by qualified personnel only!
- Before accessing the Service Mode all peripheral devices must be installed and configured!
- Access to the Service Mode is protected by the Service Password (see also last page of this manual).
- Inappropriate changes of Service Mode settings may lead to malfunction and errors in the operating sequence!

5.2 Access To Service Mode

The Service Mode is called up by touching the field of the weight display for at least 2 sec.

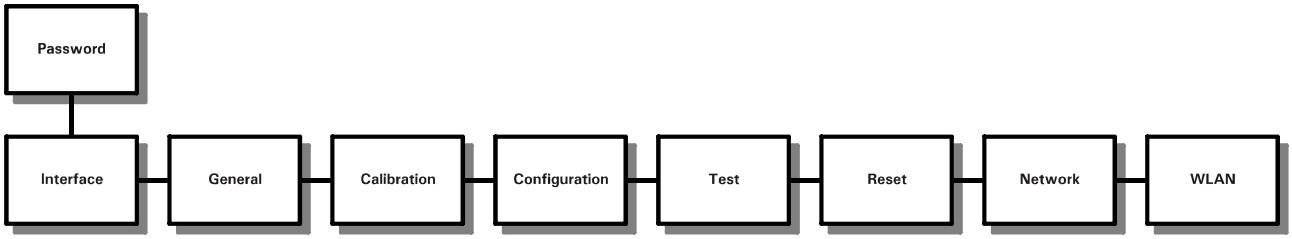
Service Mode entries are made in the Info-line.



`ID: 81154926 / V3.01`	Identification-No. of operating system and version of approved software are shown briefly.
`Password ????`	Entry of password (4 digits)
	Back to normal operation
	Display of ID / MAC address

Wrong password:

Invalid Password!	Repeat entry of password



Service Mode options:

Use arrow-keys left/right to scroll through groups.

Choose displayed group.

Back to normal operation.

Service: Interface	Configure interfaces; (see chapter 'Interface Configuration')
Service: General	Enter setup parameters: language, format of date, etc. (see chapter 'Entry Of Parameters')
Service: Calibrate	Calibrate scale; (see chapter 'Calbration Mode')
Service: Config.	Configure scale, digital I/Os, analog outputs (see chapter 'Configuration')
Service: Test	Test hardware; (see chapter 'Hardware Test')
Service: Reset	Load factory defaults; (see chapter 'Reset')
Service: Network	Make network settings; **Note:** This menu is only available with network connection.
Service: WLAN	Configure WLAN module; (see chapter 'WLAN')

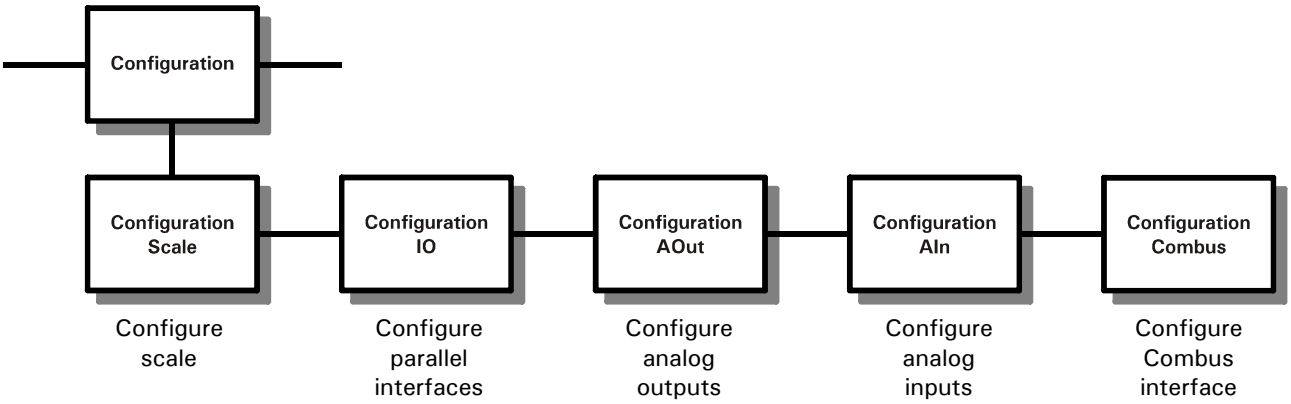
Beim Verlassen des Service Mode werden die eingegebenen bzw. geänderten Parameter abgespeichert.

Saving...	Exit Service Mode and store changes, return to normal operation.

CAUTION
Under no circumstances switch off power while 'Saving...' is displayed, because that will inevitably destroy the contents of the Flash-EPROM and thus the program.

6 Configuration

Choose group 'Config.' from Service Mode menu.



6.1 Configure Scale

```
Config.          Scale
```

```
Scale 1          ADM
```

Enable / disable scale:

Select scale driver for first scale:

ADM	Analog scale base	
DWU	Mettler-Toledo DigiTOL® loadcells connected to external DigiTOL-Box	
SBI	MC1 compatible protocol (SBI)	[1]
IDNet	Mettler IDNet protocol	[2]
xPBI	Sartorius IS scale base (digital)	
Flintec	Flintec protocol	
Wipotec	Wipotec protocol	
Remote	Access to scale of an external IT4000E, IT6000E, IT8000E or IT9000E	
MT-SICS	Mettler-Toldo protocol	
Dual-ADM	2 analog scale bases	
KERN	KERN protocol	[3]
HBM	HBM protocol	
None	Disable scale	

[1] Parameters of the Sartorius scale must be set to:
MC1 protocol (SBI), 7 bit, odd parity, 1200 baud, RTS/CTS, streaming mode, 16-character data string.

[2] Intended for Mettler-Toledo scale bases with IDNet interface.

[3] Intended for KERN scales of seies Serien EW and DS.

```
Scale 1          ADM
```

Select scale interface:

ADM1	ADM in socket ADM1
SIM 1-x	via serial interface
IDN1	IDN in socket ADM1
DWB1	DWB in socket ADM1

Remote chosen:

IP 255.255.255.255	Enter IP address of the externally connected weighing terminal.
Port 99999	Enter port.
Scale 1 Scale No. 2	Assignment of internal scale to scale of the external weighing terminal: e.g.: Scale #1 (internal) is assigned to scale #2 of external weighing terminal.

Scale 2 None	Continue with next scale, (if applicable)

Options for setting of scale driver:

	ADM1	SIM1	SIM2	IDN1	DWB1
ADM	**ADM**				
DWU		**SIM**	**SIM**		**DWB**
SBI		**SIM**	**SIM**		
IdNet		**SIM**	**SIM/IDN**	**IDN**	
xBPI					**DWB**
Flintec					**DWB**
Wipotec					**DWB**
Remote					
MT-SICS		**SIM**	**SIM**		
Dual ADM	**Dual ADM**				
Kern		**SIM**	**SIM**		
HBM					**DWB**

6.2 Configure Digital I/Os

The digital inputs/outputs are always configured in groups of 8 inputs and 8 outputs.

Config. Digital IO	Configure I/Os
Group 1: PIM 	Configure first group of I/Os, choose connection of digital I/Os: PIM — Internal I/Os PIM1/PIM2 REL/TRIO — External relay / transistor module REL485/TRIO485 connected via serial interface Modbus TCP — To control external I/O modules via Ethernet None — Not used

REL/TRIO selected:

Group 1: Port SIM1	Assignment to serial interface SIM1 - SIMx

Modbus TCP selected:

IP	Enter IP address for the local net.
2.BIO: None	Continue with next I/O group.

6.3 Configure Analog Outputs

Config. Analog out	Configure analog outputs
AOut 1: MAI 	Select analog output: MAI — External analog output module DAU8 — internal 8-bit analog output module DAU15 — internal 15-bit analog output module None — Not applicable

6.3.1 MAI Chosen

AOut 1: Port SIM1	Select pertaining internal serial interface: SIM1 - SIMx
AOut 1: Address 0	Select pertaining internal address: Address 0 - Address 7 equivalent MAI Address 16 - Address 23
AOut 1: Module X1	Select external MAI module: Module X1 - Module X4
AOut 1: Mode 0-10V	Select type of output signal: 0-10V, 2-10V, 0-20mA or 4-20mA
AOut 1: Output Appl.	Select operating mode: Appl. Controlled by application program Gross Gross weight Net Net weight
AOut 1:Calibration N	Calibration of output signal: N Skip and continue Y Calibrate output signal, connect multimeter

Calibrate output signal (Calibration = Y):

AOut 1: 0V = 9	Calibrate zero signal, e.g. =0V. Stepwise increase / decrease analog signal.
AOut 1: 10V = 4095	Calibrate full signal, e.g. 10V. Stepwise increase / decrease analog signal.

Note: The calibrated values are overwritten when the type of the output signal is changed.

AOut 2: None	Continue with next analog output.

6.3.2 DAU15 Chosen

AOut 1: Port SIM1	Select pertaining internal digital interface: PIM1 - PIMx
AOut 1: Mode 0-10V	Select type of output signal: 0-10V, 2-10V, 0-20mA or 4-20mA
AOut 1: Output Appl.	Select operating mode: Appl. Controlled by application program Gross Gross weight Net Net weight
AOut 1:Calibration N	Calibration of output signal: N Skip and continue Y Calibrate output signal, connect multimeter

Calibrate output signal (Calibration = Y):

AOut 1: 0V = 9	Calibrate zero signal, e.g. =0V. Stepwise increase / decrease analog signal.
AOut 1: 10V = 4095	Calibrate full signal, e.g. 10V. Stepwise increase / decrease analog signal.

Note: The calibrated values are overwritten when the type of the output signal is changed.

AOut 2: None	Continue with next analog output.

6.4 Configure Analog Inputs

Config. Analog in

AIn 1: MAI	Select analog input: MAI External analog input module ADI Internal analog input module None Not applicable

6.4.1 MAI Chosen

AIn 1: SIM1	Select pertaining internal serial interface: SIM1 - SIMx
AIn 1: Address 0	Select pertaining internal address: Address 0 - Address 7
AIn 1: Module X1	Select external MAI module: Module X1 - module X4
AIn 1: Mode 0-10V	Select input signal: 0 - 10V, 2 - 10V, 0 - 20mA, 4 - 20mA
AIn 2: None	Continue with next analog input.

6.4.2 ADI Chosen

AIn 1: Port PIM1	Select pertaining internal digital interface: PIM1 - PIMx
AIn 1: 0-10V	Select input signal: 0-10V, 2-10V, 0-20mA or 4-20mA
AIn 2: None	Continue with next analog input.

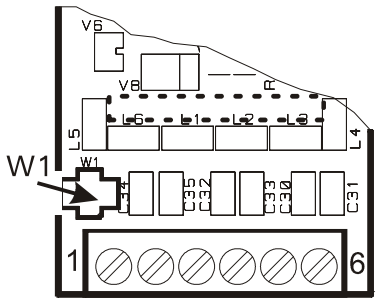
7 Calibration Mode

Described below is only the *access* to the calibration mode, for a detailed description of the calibration procedure refer to the following manuals:

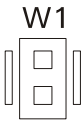
- ADM / DUAL-ADM / ADM8000-Exi Calibration Manual, order-No.: ST.2309.0688
- Flintec / HBM Calibration Manual, order-No.: ST.2309.1568
- MultiRange Calibration Manual, order-No.: ST.2309.0057

Described below is only the *access* to the calibration mode.

Prior to power up the jumper W1 must be removed. Only with this jumper setting can the changed parameters be saved in memory after the calibration



Calibration released



In Service Mode call up group 'Calibrate'.

`Calibrate Scale 1`	◀ ▶	Choose any of the installed scales
	F1	Show error protocol of scale
	↵	

If jumper W1 is still in place:

`Calibration Locked`		Warning: jumper not in calibration position, parameters cannot be saved!
	↵	Enter calibration mode without saving (e.g. to check settings)

Note: Left to the display with the calibration steps, the number of the selected scale is shown [W1], [W2], etc.

After pressing the ^ -key to exit the calibration mode:

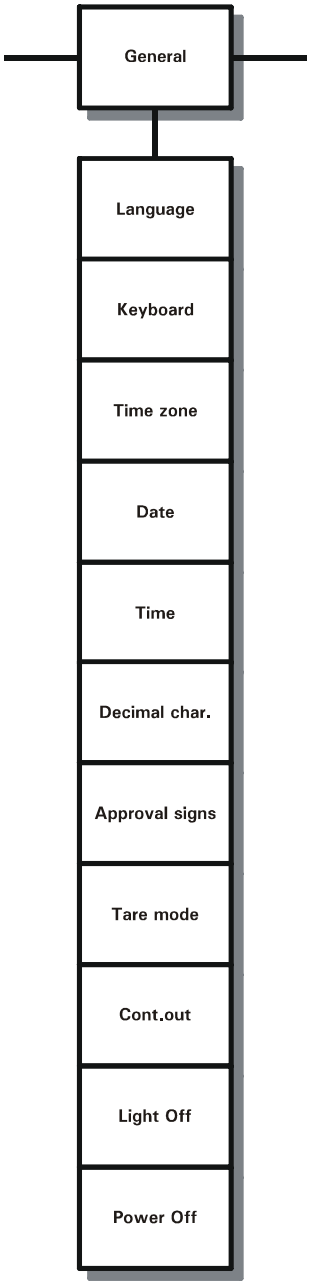
`Save Parameters ? Y`		Save parameters in EEPROM
	1	Y(es): Save parameters
	0	N(o): Ignore all changes, do not save data
	◀ ▶	or scrolling

If jumper W1 on ADM module is still in place:

`Error Calibr. Jumper`		Error message: jumper not in calibration position, parameters cannot be saved!
	↵	Exit calibration without saving

8 Entry Of Parameters (General)

Choose group 'General' from Service Mode menu.



Language: German

Select language:

German
English
French
Polish
Dutch
Italian
Spanish
Danish
Swedish
Norwegian
Greek
Czesh

All languages except German:

Keyboard: US	**Info** Keyboard layout: US = US layout GB = Britisch layout

Time Zone: CET	Select time zone. CET = Central European Time Other time zones: Canada, EET, EST, Etc, Europe, GB, GMT, HST, MET, MST, Mideast, NZ, Pacific, Singapore, UCT, US, UTC, WET, Africa, America, Asia, Atlantic, Australia, Brazil **Note:** For some entries the particular location must be specified, e.g. 'Pacific-Apia'. With 'Etc' a time difference to GMT can be chosen. Automatic summer / winter time switching is made dependent on the chosen time zone.

! ATTENTION
After changing the time zone, current time must be entered under menu item 'Settings' (see operation maual of application software).

Date: DD.MM.YY 	Select format of date: DD.MM.YY MM.DD.YY YY.MM.DD DD-MM-YY MM-DD-YY YY-MM-DD DD/MM/YY MM/DD/YY YY/MM/DD DD.MM.YYYY MM.DD.YYYY YYYY.MM.DD DD-MM-YYYY MM-DD-YYYY YYYY-MM-DD DD/MM/YYYY MM/DD/YYYY YYYY/MM/DD
Time: HH:MM	Select format of date: HH:MM HH:MM:SS H = hour S = second
Decimal char.: Dot	Select character to separate decimals: Dot (e.g. 0.00) Comma (e.g. 0,00)
Approval signs: N	Y(es): Weights are printed with approval signs in compliance with former PTB regulations: Example: Gross/Tare/Net <25.45kg> / <10.00kg> / <15.45kg> or <25.45kg> / 10.00kgPT / 15.45kgC N(o): Weights are printed in compliance with EC regulations: Example: Gross/Tare/Net 25.45kg / 10.00kgT / 15.45kgN or 25.45kg / 10.00kgPT / 15.45kgN

Tare mode: Gross/Net	Select tare mode: Gross/Net = press tare key to toggle gross / net display and back; Auto Clear = on return to the zero range the tare weight is automatically cleared; Net=0 = every time the tare key is pressed the scale is autotared, on return to the zero range the tare weight is automatically cleared and the display returns to gross mode.
Cont.out Off	Setting for continuous output: Sys.Format SysTec format Flintec Flintec format Customized Freely defined format Sys.Remote RemoteDisplay Toledo TOLEDO® format Schauf Schauf format CAS CAS format GS Gebhardt&Schäfer protocol with support of traffic light function Off Continuous output disabled

Data strings of the continuous output are described in chapter 'Continuous Output'.

Continuous output enabled:

Cont.out: SIM1	Choose serial interface for continuous output: SIM1 – SIMx

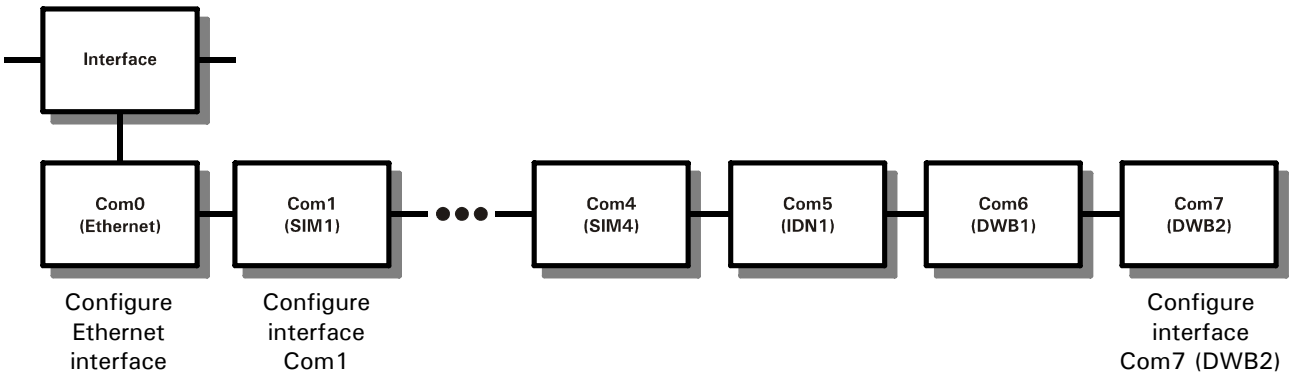
Customized format chosen:

:AAAAAAAAAA	String for freely defined format, see chapter 'Continuous Output'.

Light Off (Min.) 99	If terminal is not in use, the backlighting is switched off after this time has elapsed (powersave for battery operated terminals). Press any key to switch back-lighting on again. Enter 0 to disable this function.
Power Off (Min.) 99	Enter time in minutes after which the terminal is switched off when it is not in use (powersave function for battery operated terminals).

9 Interface Configuration

Choose group 'Interface' from Service Mode menu.



Note: The setting of parameters must correspond to those of the connected peripheral devices.

`Interface Com0(Eth)` — Configuration of Ethernet interface

↵

`Com0: Port 99999` — Enter port

`Com0: No Protocol` — Select protocol of Com0:

None	Raw data only
TTY	Printer protocol (data only)
AckNak	ACK / NAK procedure with confirmation
NoAck	NO-ACK procedure without confirmation

If TTY was selected as printer protocol:

`Com0: Latin 1` — Select character set of output:

None	ISO8859 in accordance with chosen language
850	DOS Codepage 'Western Europe' (obsolete printers)
852	DOS Codepage 'Central Europe'
866	DOS Codepage 'Russia'

If AckNak or NoAck was selected as protocol:

`Com0:Start Char 999` — Entry of start character as decimal value (e.g. 2 = STX)

For entry '0' no start character is transmitted.

`Com0:End Char 999` — Entry of end character as decimal value (e.g. 3 = ETX)

For entry '0' no end character is transmitted.

`Com0:Chksum None` — Select method to calculate the checksum which is transmitted behind the end character:

Chksum None	No Checksum
Chksum XOR	Exclusive-Or checksum
Chksum CPL	Complement of two

If a start or end character was specified and a checksum was selected:

Com0:With Start N	**Y**	The start character is included in the checksum calculation
Com0:With End N	**Y**	The end character is included in the checksum calculation

Interface Com1(SIM1)	Continue with interface Com1
Com1: Baud 9600	Select baud rate of Com1: 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200
Com1: Databits 8	Select data format for serial interface Com1: 7 data bits, 8 data bits. Always 1 stop bit is transmitted.
Com1: Parity None	Select parity for interface Com1: None Even Odd
Com1: Ctrl. None	Select hardware handshake for interface Com1: XOn/XOff RTS/CTS None no transmission control
Com1: Protcl. None	Select protocol of Com1: None Raw data only TTY Printer protocol (data only) AckNak ACK / NAK procedure with confirmation NoAck NO-ACK procedure without confirmation

If TTY was selected as printer protocol:

Com1: Latin 1	Select character set of output: None ISO8859 in accordance with chosen language 850 DOS Codepage 'Western Europe' (obsolete printers) 852 DOS Codepage 'Central Europe' 866 DOS Codepage 'Russia'

If AckNak or NoAck was selected as protocol:

`Com1:Start Char 999`	Entry of start character as decimal value (e.g. 2 = STX) For entry '0' no start character is transmitted.
`Com1:End Char 999`	Entry of end character as decimal value (e.g. 3 = ETX) For entry '0' no end character is transmitted.
`Com1: Chksum None`	Select method to calculate the checksum which is transmitted behind the end character: Chksum None — No Checksum Chksum XOR — Exclusive-Or checksum Chksum CPL — Complement of two

If a start or end character was specify and a checksum was selected:

`Com1: With Start N`	**Y**	The start character is included in the checksum calculation
`Com1: With End N`	**Y**	The end character is included in the checksum calculation

`Interface Com2(SIM2)`  Continue with following interfaces.

10 Network

Choose group 'Network' from Service Mode menu.

Note: This menu is only available when network connection has been established.

Network settings for Ethernet interface of weighing terminal:

IP: 10.0.10.9	Entry of IP address for the local net: Note: The weighing terminal does not support DHCP and requires a permanent IP address.
Mask:255.255.0.0	Entry of subnet mask
DNS: 10.0.1.3	Entry of DNS sever
NTP: 192. 53.103.108 Example for ptbtime1.ptb.de	Entry of NTP server for time synchronization, this requires entry of time zone. Applicable only if time zones are supported by the firmware.
FTP pwd:9999999	Entry of password for the FTP shared directory **F–** Activate alphanumeric entries **F.** Activate numeric entries
Web access Off	Enable / disable access to data via web browser.

Web Access = On

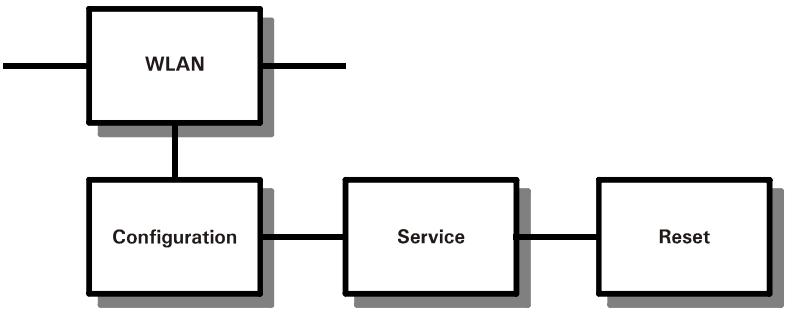
Web pwd: 9999999	Specify administrator password **F–** Activate alphanumeric entries **F.** Activate numeric entries
Web name: ITx0000_1	Specify web name for browser **F–** Activate alphanumeric entries **F.** Activate numeric entries

Terminal No. 999	Entry of terminal-No. for the network name. The network name is generated from the terminal type and the terminal-No. Example: IT6000ET_001, IT8000E_123

11 WLAN

Note: Weighing terminals with firmware older than 'Scale_3.9.x' require that the configuration described below must be activated first in the WLAN module, otherwise the parameters entered here do not take effect.

Choose Service Mode group 'WLAN'.



11.1 Configuration

Settings for connection of the WLAN module:

SSID: XXXXXXXXXXXXXX	Name of network that is to be connected.
Type: Ad-Hoc	Select Ad-Hoc or Infrastructure; (depending on local network)
Ad-Hoc chosen:	
Channel 99	Select communication channel (standard = 11)
Security: WPA2	Encryption method, e.g. WPA or WPA2, (depending on local network, not recommended: WEP)
WPA2 chosen:	
Encryption: TKIP	TKIP via TKIP CCMPI/AES via AES
WPA/WPA2 chosen:	
Change Key: Y	Encryption method chosen: Y: activate network password / network key
Key Type: Passphrase	Passphrase alphanumeric Hex hexadecimal
Key: XXXXXXXXXXXXXX	Entry of network password / network key
Store Parameter: Y	With Y(es) the settings are stored and the WLAN module automatically performs a reset.

After successful configuration, the WLAN module works in bridge mode.

11.2 Service

Network settings for the WLAN modul of the weighing terminal:

IP: 10.0.10.175	Entry IP address of the weighing terminal for the local net: Note: The weighing terminal does not support DHCP and requires a permanent IP address.
Mask:255.255.0.0	Entry of subnet mask
Gate:0.0.0.0	Entry of gateway
W.IP: 10.0.10.176	Entry of WLAN IP address: Note: The weighing terminal does not support DHCP and requires a permanent IP address. This IP address must not be identical to the IP address assigned above, but must be part of the same network.
Store Changes: Y	With Y(es) the settings are stored and the WLAN module automatically performs a reset.

Notes:

- To recognize the weighing terminal in the network, a gateway must be entered. The syntax of the gateway must correspond to the entered IP address and the subnetmask.
- If the IP address of the WLAN module does not correspond to the address range of the weighing terminal, the error message 'WiPort Unreachable' is output.This message can be acknowledged with Enter/Ok, after that the IP adrress of the terminal or the WLAN module can be corrected.
- Access to the IP address of the weighing terminal via RTC is possible.

11.3 Reset WLAN

With the function 'Reset' the WLAN module can be reset. The transparent (bridge) is exited and the WLAN module can be configured anew.

```
Reset WIPort        Y
```

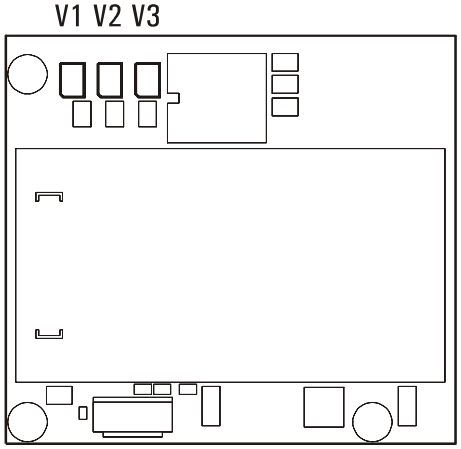
Y ↵ Reset the WLAN module

```
   Resetting...
```

- Wait approx. 10 sec while a RESET is being performed.
- Restart weighing terminal.

Note: Communication via WLAN modul and Ethernet (LAN) is NOT possible at the same time.

11.4 LEDs On The WLX Module

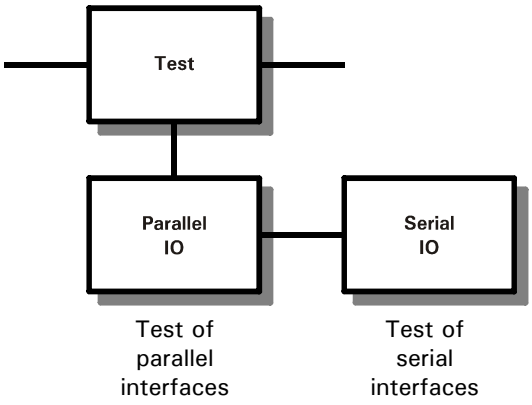


LED	Name	State	Function
V1	WLAN: LINK	On	WLAN switched on
		Off	WLAN switched off
V2	LAN: ACT	On	LAN active
		Off	LAN not active
V5	STATUS: WIP	On	LAN connection
		Off	No LAN connection

12 Test (Hardware)

W A R N I N G
Exercise utmost care when making checks, tests and adjustments that can actuate movable parts such as feeding devices, gates, flaps, conveyors, etc. Make absolutely sure that nobody is within reach of movable parts.
Failure to observe this precaution could result in bodily injury!

Choose group 'Test' from Service Mode menu.



12.1 Test Of Parallel Inputs/Outputs

```
Test:    Parallel IO
```

↵

```
BIO 1  In:00000010 Out:00000001
```

Status information 0 or 1 for the optional digital inputs and outputs.

The keys 0 - 7 are used to toggle the outputs 0 to 7.

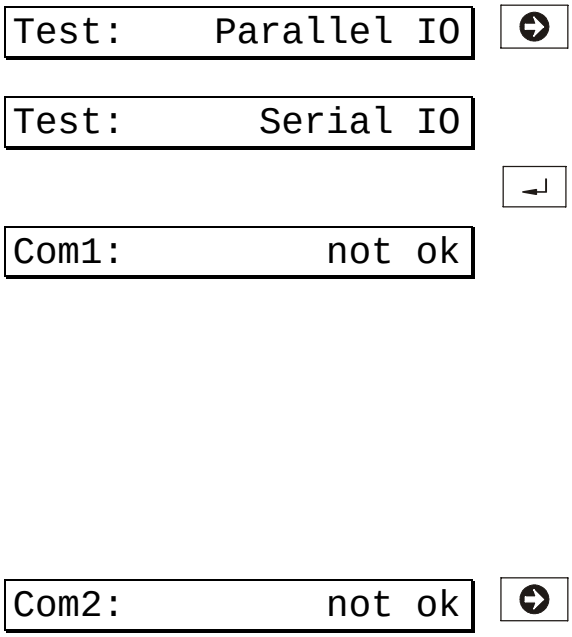
The picture above shows the state:

input 0, 2-7	= Off	input 1	= On
output 0	= On	output 1-7	= Off

```
BIO 2
```

↵ Continue with next I/O module (if applicable).

12.2 Test Of Serial Interfaces



Test of serial interfaces (RS232 and RS485-4-wire);

RS232: jump lead from terminal 1 to 3 and from terminal 2 to 4 (connect RTS with CTS and TxD with RxD).

RS485.4: jump lead from terminal 1 to 3 and from terminal 2 to 4 (connect TxD + with RxD + and TxD– with RxD–).

Note: Test of RS485 2-wire and 20mA interfaces is not possible.

Continue with next interface.

13 Reset

With this function values and parameters of the Service Mode can be reset to factory settings. Parameters for calibration and network configuration remain unchanged.

Choose group 'Reset' from Service Mode menu.

13.1 Reset Parameters

Reset Parameters? Y **Y** Reset parameters of Service Modes.

↵

Resetting...

Group	Value		Value
Interface	Com0: Port 1234		Com1: Ctrl. None
	Com0: Protocol None		Com1: Protocl. None
	Com1: Baud 9600		Com1: Start char. 0
	Com1: Databits 8		Com1: End char. 0
	Com1: Parity None		Com1: Checksum None
General	Language: German		Tare mode: Gross/Net
	Date: DD.MM.YY		Cont.out Off
	Time: HH:MM		Light Off (Min.) 0
	Decimal char.: Dot		Power Off (Min.) 0
	Approval signs: N		
Config. Scale	Scale 1: ADM		Scale 2: None
Config. Digital IO	Group 1: PIM		Group 2: None

13.2 Reset Approved Weight

! ATTENTION
All records in the W&M approved data archive are irrevocably deleted without further prompt for confirmation.

`Reset Approved Wgt Y` **Y** Delete W&M approved data archive

↵

`Service: Reset`

14 Data Archive

A record -secured with checksum- is stored for every completed weighing transaction in the internal data archive, consisting of weight, date and consecutive Id-No. The Id-No. is reset to 0001 with every change of the date. As an alternative to the internal memory, also a USB stick may be used as data storage device. The stored data are read-only and cannot be deleted or changed.

Call up data archive with display switching key.

Previous / Next	Scroll records
Search date	Enter date of record that is to be looked up
Id-No.	Enter ident-No. of record that is to be logged up
Scale	Show scale-No.
Gross	Gross weight of record
Net	Net weight of record
Tare	Tare weight of record

If an error is detected in the checksum of the data archive, the stored data are void! Instead of a weight, a corresponding error message is shown.

15 Continuous Output

The interfaces COM1 – COMx can be configured as continuous output, one of several protocols can be chosen in group 'General' of the Service Mode. Conflicts of the assignment of peripheral devices must be avoided.

Setting of interface parameters is made in group 'Interface' of the Service Mode.

15.1 SysTec Standard Protocol

The data string consists of 15 ASCII characters plus CR and LF. It includes a status for motion / no motion, the net weight and the unit sign. Digits not used are filled with space characters. Examples:

Digit: '123456789012345'

'S 10.98 t '	S = Scale settled (no motion),
'SD 10980 kg'	SD = Scale in motion (not settled),
	13th character always space.

15.2 Flintec Protocol

The data string to connect a Flintec remote display consists of 1 start character (@), 7 ASCII characters for the net weight plus CR. Example:

Char.: '123456789'

'@ 10.95$^{C}_{R}$'	1. character always @ (Hex 40)
	9. character always CR (Hex D)
	non-significant digits of the weight value are transmitted as space characters (Hex 20).

15.3 SysTec Remote Protocol

This data string is used to connect an IT1000 remote display with extended functions.

The operating mode 'Remote Display' must be chosen in the configuration of the IT1000 remote display. Actuating the tare and zero key at the remote display is transmitted back to the weighing terminal and has the same effect as pressing the corresponding key here. The data string is identical to the 'SysTec Standard Protocol'.

15.4 Schauf Protocol

The data string to connect a Schauf remote display consists of [ESC], [33], [32], 1 space character, 5 ASCII characters for the net weight plus [CR].

15.5 Customized Protocol

The data string can be freely defined. In the table below **x** is a wild card. If you want -for instance- to send the character ~ when the scale is in motion, the corresponding string is **M~** (condition = true). If the condition is false, a space character is send instead. Weights are transmitted as shown on the display including decimal separator. Non-significant (leading) weight digits are transmitted as space.

String	Transmission	Example
Mx	Transmits the character specified under **x**, when the scale is **in motion**, e.g.: ~	**M~**
mx	Transmits the character specified under **x**, when the scale is **settled**, e.g.: **R**	**mR**
Ox	Transmits the character specified under **x**, when the scale is **in overload**, e.g.: **U**	**OU**
ox	Transmits the character specified under **x**, when the scale is **not in overload**, e.g.: **U**	**oU**
Zx	Transmits the character specified under **x**, when the scale is **in zero range**, e.g.: **N**	**ZN**
zx	Transmits the character specified under **x**, when the scale is **not in zero range**, e.g.: **N**	**zN**
Px	Transmits the character specified under **x**, when the scale is **tared**, e.g.: **T**	**PT**
px	Transmits the character specified under **x**, when the scale is **not tared**, e.g.: **T**	**pT**
[space]	Transmits a space character	**[space]**
Gx	Transmits the **gross weight** with **x** digits, e.g.: **8**	**G8**
Nx	Transmits the **net weight** with **x** digits, e.g.: **8**	**N8**
Tx	Transmits the **tare weight** with **x** digits, e.g.: **6**	**T6**
U	Transmits the **unit of calibration**, e.g: '**kg**', '**t** ', '**g** ', '**lb**'	**U**
123	Transmits a **specified character** (3-digit decimal code)	**002 = STX**

Example:

String: **'mRN8U013010'**:
This instruction generates a string consisting of the character 'R' when the scale is settled, plus the 8-digit net weight, unit sign and CR, LF.

16 Transport, Maintenance And Cleaning

16.1 Transport

Notes:

- Transport and storage of electronic components such as boards, EPROMS, etc. must only be made in suitable anti-static ESD bags or cases.
- Storage temperature –25 to +70°C at 95% max. relative humidity without condensation.

16.2 Maintenance

CAUTION

- **This unit and its associated equipment must be maintained by qualified personnel only, who are familiar with the construction and operation of all equipment in the system and the potential hazards involved. Failure to observe these precautions could result in bodily injury!**

  Disconnect all power to this unit before servicing!

The weighing terminal is designed to require a minimum of maintenance and service, however, depending on the environmental conditions a visual inspection at regular intervals is recommended. The frequency at which normal maintenance (cleaning and inspection) should be performed, when installed in a clean office environment, should be twice a year. However, if the unit is subject to a dusty or dirty environment the frequency should be increased as required. At these inspections it should be made sure that all connected cables are undamaged and that all connectors are tightly fastened.

Maintenance of scale platforms is required at regular intervals depending on use and environment. The accuracy of scales can be affected by dirt, foreign objects, etc. and appropriate maintenance is strongly recommended. Also recommended is the calibration with certified test weights at regular intervals.

16.3 Cleaning

CAUTION

- **Disconnect all power to this unit before servicing!**

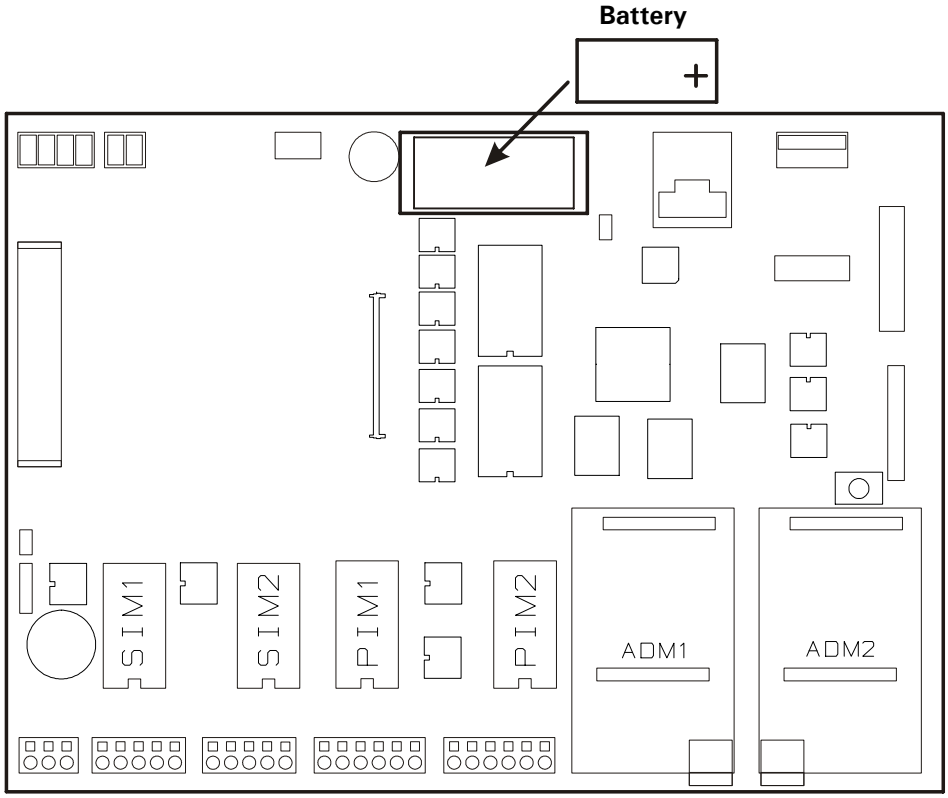
Clean the keyboard and covers with a soft clean cloth that has been dampened with a mild window type cleaner. Do **NOT** use any type of industrial solvent or the finish of the unit may be damaged. Do not spray cleaner directly on the unit.

16.4 Replacing The Battery

CAUTION
For the storage of data the weighing terminal contains a lithium battery. Risk of explosion if battery is replaced improperly! Replace only with battery of the same type or with compatible type recommended by manufacturer. Disposal of used batteries only as indicated by manufacturer.

The life time of the lithium battery that backs up RAM and real-time clock is at least three years in normal operation. Thus, the battery needs to be replaced at 3-year intervals by a trained service technician.

W A R N I N G
Disconnect all power to the instrument and/or unplug line cord prior to opening the housing! Failure to observe this precaution could result in bodily injury!



To replace the battery proceed as follows:

- Disconnect all power to the instrument, unplug line cord.
- Open the housing and refer to picture above to locate the mainboard.
- Use small screw driver or other suitable tool and carefully remove bracket from battery holder.
- Carefully remove old battery from holder and insert new one within 30 sec. **Note:** Observe correct polarity as shown on the picture, otherwise the entered data will not be stored!
- Put bracket of battery holder back in place.
- Close housing and power the instrument up. Display of weighing terminal shows power up message. The unit is operational again.

Please note: Observe all applicable regulations for the disposal of used batteries!

17 Trouble Shooting

CAUTION

- **This unit does not contain any customer serviceable parts!**

  Only permit qualified personnel to service this equipment. Exercise care when making checks, tests, and adjustments!

If any problem arises that has not been explained above, please follow this check list:

- Power supply on and line cord undamaged (visual inspection)?
- All cables connecting to scales and peripheral devices undamaged (visual inspection)?
- Connectors fitted correctly and tightly secured at peripheral devices (visual inspection)?

If operational difficulties are encountered that cannot be rectified by means of this manual, obtain as much information as possible regarding the particular trouble, as this may eliminate a lengthy, detailed checkout procedure.

If possible, try first to determine the conditions under which the problem occurs. Try to find out whether the appearance of the difficulties can be reproduced under the same conditions.

For the systematic analysis of an unknown problem the information as listed below is required:

- Serial-No. of the unit and its peripheral components
- Program version as displayed on power up
- Exact wording of any error message displayed
- Type and model of peripheral devices related to the problem (e.g. scale, printer, etc.)

To obtain professional assistance contact your service station stating the information listed above.

CAUTION

- **It is suggested that assistance from trained service personnel be requested in the event a problem should arise that is beyond the scope of this instruction manual.**

17.1 Error Log Of Scale

```
Calibrate Scale 1
```

F1 View error log of scale

```
06.06.12 08:52    Ok
```

Date, time and error code of event are shown.

Code	Event
Ok	Ok
Over	Overload
Under	Underload
Range	Out of range
Miss.	Not installed
Incl.	Incline sensor
PUOvr	Powerup out of range
PUUdr	Powerup motion
Invalid	Not calibrated
IOErr	I/O error
Not I	Not installed
NotOk	Not ok
E32	Other error message 32

17.2 Error Messages

If an error occurs during calibration or normal operation, error messages are displayed as follows:

Error Message	Possible Cause	Corrective Measure
Calibration Locked	• Jumper for protection of calibration parameters in position 'protected'	• Set calibration jumper to calibration position
Error Calibr. Jumper	• Parameters cannot be saved, jumper in wrong position	• Set jumper to correct position, repeat calibration
ADM not installed	• No A/D converter installed	• Check A/D converter
Not Available	• No scale selected	• Check parameters in Service Mode
ADM Defect **ADM Error**	• No data received from A/D converter • Short circuit in L/C cable	• Replace A/D converter • Check cabling
Resolution Error	• Internal resolution too small, must be at least tenfold the displayed resolution	• Select bigger increment size • Use L/C with lower capacity
ADM Over **Out Of Range**	AA/D converter overrange: • Wiring error loadcell • Loadcell defective • Scale heavily overloaded	 • Check wiring • Check loadcell • Unload scale

Error Message	Possible Cause	Corrective Measure
O v e r l o a d	• Scale in overload • CPU does not receive data from weighing interface	• Unload scale • Check internal and external wiring and cabling
U n d e r l o a d	• Gross weight smaller than −20d (under zero)	• Load scale • Set parameter 'Underload 20d' to N = Off
Powerup Out of Range	• Error power up zero. This message appears on power up if the weight on the scale exceeds the power up zero range (+2%, +10%) or is below the power up zero range as set in the calibration (−2%, −10%) as set in the calibration.	• Unload scale or apply dead load
Powerup Motion	• This message appears on power up if the terminal cannot detect a settled weight within the specified power up zero range (±2%, ±10%).	• Settle scale
Error Transmission	• Host switched off or off-line, data cable not connected or damaged	• Switch on host and start communication program • Check cable and connectors • If problem cannot be rectified, disable data transmission

18 Technical Data

18.1 IT6000ET

Housing	Stainless steel wall/desk housing, protected to IP65, weight approx. 4.2kg Stainless steel panel-mount housing, fascia plate protected to IP65 (when installed accordingly).
Temperature Range	Storage: –25°C to +70°C at 95% relative humidity max. without condensation Operation: –10°C to +40°C at 95% relative humidity max. without condensation.
DC Power Supply	Supply voltage U_N: 12V (–15%) – 30 V (+10%) DC Rated Current I_N: 2.2 - 0.6A
Display	Active touch sensitive color TFT, size 152 x 91 mm (7“), 800 x 480 pixels.
Processor	32-bit ARM processor, 266MHz Linux operating system
Scale Interface Module	1 x ADM (1 scale) or 1 x DUAL-ADM (2 scales) to connect analog loadcells in 4- or 6-wire mode; W&M approved resolution of 6000 divisions, 50 – 400 updates / second Overall impedance of connected loadcells: 43 – 4500 Ω or: 1 x DWB to connect digital loadcells with RS485 interface; 1 x IDN to connect Mettler-Toledo digital force transducers with IDNet interface.
Battery	Size ½ AA (e.g. Varta 6127); battery backup for data, parameters and files (min. 3 years in normal operation, approx. 1 year when permanently switched off), optional data backup on PC.

Options:

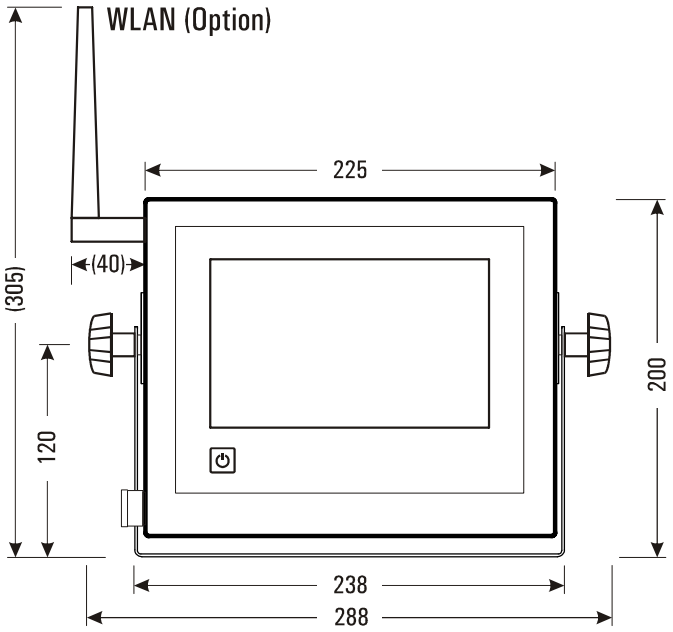
Serial Interface Modules 2 x SIM	SIM-RS232, SIM-RS485-4-wire, SIM-RS485-OPTO, SIM-20mA (only passive / passive), DUAL-ISM
Digital I/O Modules 2 x PIM	2 optoisolated digital inputs (12 - 24VDC / 7 mA) 2 optoisolated digital outputs (12 - 24VDC / 100mA)
Analog Output Module 2 x DAU	1 analog output related to gross or net weight, 0 - 20 mA, 4 - 20 mA, 0 - 10 V, 2 - 10 V selectable
Analog Input Module, 2 x ADI	1 analog input selectable 0 - 20 mA, 4 - 20 mA, 0 - 10 V, 2 - 10 V
WLAN Extension Module, 1 x WLX	Connection to wireless local area networks

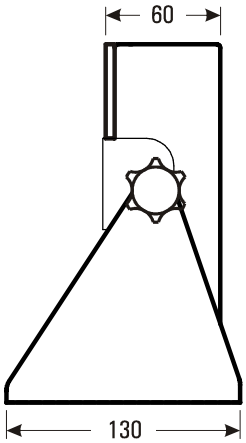
18.2 ITX000ET External Power Supply Unit

Construction	Aluminum housing for wall-mount / desk-top installation, protected to IP66, weight: approx. 1 kg
Temperature Range	Storage: –25°C to +70°C at 95% relative humidity max. without condensation Operation: –10°C to +40°C at 95% relative humidity max. without condensation
Input:	Input voltage: 110 VAC (—15%) – 240 VAC (+10%) Frequency: 47 - 63 Hz Current consumption: 0.4 - 0.2 A
Output:	Output voltage: 12 VDC Output current: 2.0 A
Electrical Safety	Separation between primary and secondary circuits SELV, in accordance with EN 60950

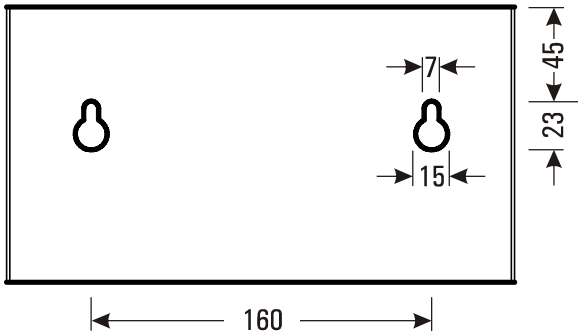
19 Dimensions

19.1 IT6000ET

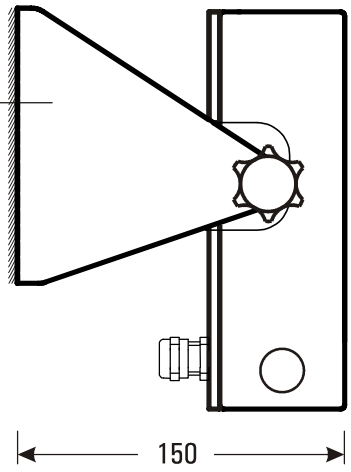




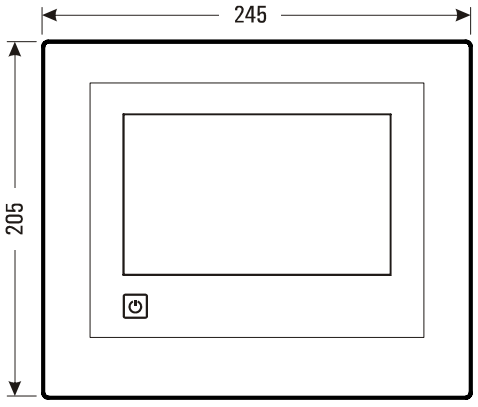
Fixing holes

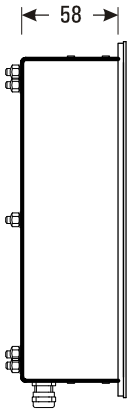


Wall-mount installation

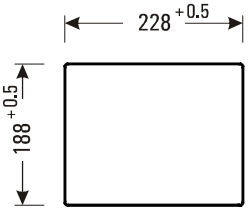


Panel-mount installation

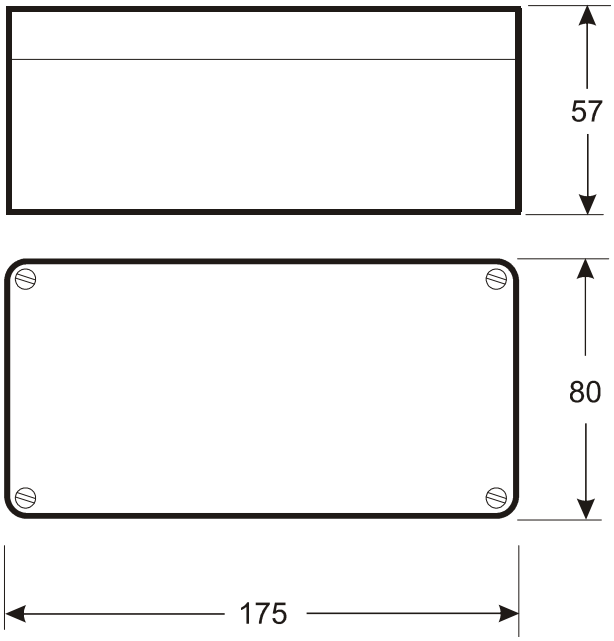




Cutout in panel



19.2 ITX000ET External Power Supply Unit



20 Service Password

The service password is required to access the Service Mode.

The password is: 2234

If you want to prevent unauthorized access to the Service Mode, remove this page from the manual and keep it in a safe place.

If access to the 'Settings' menu of the application program is protected by a *User Password*, also entry of the *Service Password* is accepted. This might be helpful in cases when the User Password is not available any more.