



WARNING

FAILURE TO COMPLY WITH THE RULES PUBLISHED
IN THIS MANUAL MAY RESULT IN PHYSICAL INJURY
OR MATERIAL DAMAGE

1. Only qualified personnel with a thorough knowledge of the equipment and its *Operating and Maintenance Manual* are authorized to install, operate, adjust, troubleshoot and maintain the equipment.
2. Always perform the lockout procedure before making any equipment or part maintenance, repair, modification, replacement, assembly or disassembly; or taking any action involving even the slightest risk.
3. Never use this equipment for purposes other than those for which it was intended.

This document contains the most up-to-date information available at the time of publishing. Due to Premier Tech's ongoing improvement policy, the company reserves the right to discontinue or update manuals and technical information as it sees fit, without notice and without further obligation on its part.

PRELIMINARY SECTION

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COMMUNICATION PARAMETERS

INPUT/OUTPUT DESCRIPTIONS

SYSTECL MANUALS

IT8000ET_THE 201702
ADM_KAE _FEBRUARY 2016
JUNCTIONBOX_THE 201602
REL_TRIO_IAE 201602
DAM_IAE 201703
MAI_IAE 201604

PRELIMINARY REMARKS

CONTENT

The operating manual includes information on your equipment but some very specific options may not be described.

WRITING CONVENTIONS

- Each machine and equipment line is comprised of a series of modules. Each module has a name and a number. The names are set in SMALL CAPITALS.
- All motors, sensors, and valves are labelled with a code. The first two digits refer to the module number. The last digit is required to increment the code if necessary. The middle letters describe the item:
 - M: motor,
 - PX or PC: sensor,
 - SV: valve.

Example:

xxM2: **xx** is the number of the MODULE (**xx**)
 M indicates that the item is a motor
 2 means this is the second motor on this module

- Names of operating screens, controls, and parameters are set in **bold** type.
- Many symbols appear frequently throughout the manual. Their meaning is as follows:



Where this message appears failure to comply with procedures and safety recommendations will result in death or serious injury.



Where this message appears failure to comply with procedures and safety recommendations could result in death or serious injury.

CAUTION

Where this message appears failure to comply with procedures and safety recommendations may result in equipment damage.

Note: Paragraphs that begin with this word provide additional information on a specific procedure. These are particularly useful for first-time users.

Advice: Paragraphs that begin with this word provide advice on use or describe another way to carry out an operation.

Caution: Paragraphs that begin with this word warn about the irreversibility of an action or about situations that require special attention.

SAFETY

1 SAFETY

This chapter describes the entire body of safe practices for all items of equipment commercialized by Premier Tech Chronos. Therefore, some safe practices may not apply to all items of equipment. The user has to take into consideration only the rules applying to the relevant items of equipment.

Each equipment user is responsible for understanding and complying with applicable local, provincial and federal laws and regulations, including those regarding safety.

To assist its customers in this area, however, Premier Tech issues the following basic safe practices. The user will no doubt be required to draft more detailed rules so as to comply with local regulations and accommodate specific operating conditions.

In addition to complying with the abovementioned provisions, measures and safe practices, the equipment user must refer to and comply with any applicable safety instructions issued by manufacturers of all related modules and all components of the equipment used.

As specified by applicable safety standards, the user has the responsibility to ensure that their company's personnel are properly trained, that this manual is handed over or made available to said personnel and that their company's personnel have read, understood and complied with all instructions, especially regarding safety.

Applicable safety standards also require the user to complete a risk assessment and ensure that the risk level is maintained at an acceptable level during handling, installation, operation, adjustment, troubleshooting and maintenance of equipment. Should the user want to further reduce the risk level through equipment design, Premier Tech Chronos may offer additional safety devices, mainly for risks associated with possible equipment misuse.

 **DANGER**

Only qualified personnel with a thorough knowledge of the equipment and its *Operating and Maintenance Manual* are authorized to handle, install, operate, adjust, troubleshoot and maintain the equipment.

1.1 Unloading and Handling

Certified handling, hoisting and support techniques must be used when moving or lifting the equipment and component parts. The equipment is heavy and can cause severe injury or death if it falls.

Do not use lifting hooks to lift or move a group of modules or the whole equipment. Lifting hooks are designed to lift individual modules only.

Do not walk or stand under or near a load suspended by hoisting equipment such as crane, forklift, bridge crane, loader, hydraulic or compressed-air piston, or inclined unloading ramp. The equipment is heavy and can cause severe injury or death if it falls. Where this situation cannot be avoided, ensure that the load is restrained by blocks, posts, stays or beams, for example.

If there is any chance that a load's center of gravity may shift in relation to the device used to hoist or restrain it, secure the load firmly to the hoisting device before hoisting.

Do not stand under a load supported by wheels unless the wheels are blocked to prevent horizontal movement.

Make sure to anchor electrical panels and all parts of equipment. Non anchored parts could fall and cause serious injuries or death.

1.2 General Rules

DANGER

Some equipment can start up automatically. Never enter a danger zone without performing the lockout procedure.

DANGER

**Never touch or enter the path of moving components without performing the lockout procedure.
Doing so may result in serious injury or death.**

DANGER

The following modes: automatic, semi-automatic, manual and off modes do not shut off power sources. Those modes are not designed to ensure safe access inside the equipment.

⚠ DANGER

Never open an electrical panel with power ON. Only qualified personnel wearing appropriate personal protective equipment are allowed to work on an electrical panel with power ON.
Arc flash and electrical shock hazard.

⚠ DANGER

Never access equipment interiors using areas intended for loading or discharging product, empty bags, filled bags, containers, empty pallets or pallet loads.
Only use areas specifically intended for accessing the equipment.

⚠ DANGER

Areas specifically intended for accessing the equipment allow safe access to this equipment section only.
Never try accessing nearby equipment sections without using their own designated access areas.

⚠ DANGER

Never walk on a conveyor. Always use the designated access and circulation areas.

CLOTHING, JEWELRY AND LONG HAIR

Although equipment is fitted with guards to protect operators from moving components, these devices do not always provide complete protection. It is the operator's responsibility to show caution and good sense. The following points are basic safety precautions, and should always be obeyed.

- ◆ Never wear loose clothing (shirt, sweater, tie, scarf, etc.) that could get caught in the machine.
- ◆ Never wear jewelry, except for a medical alert bracelet or necklace.
- ◆ Long hair must be confined in a net or otherwise securely confined.

PERSONAL PROTECTIVE EQUIPMENT

When working on or around equipment, workers must always wear the following personal safety items: safety glasses, safety helmet, and safety boots. Respirator masks must be worn when working in areas where the air's pollutant or dust content exceeds permissible limits. Hearing protectors (plugs, ear muffs or other) must be worn in work areas where the noise level exceeds permissible limits. A safety harness must also be worn when accessing an elevated, unprotected section of the machine. Anchorage connectors are installed on equipment where height accesses are predictable. When anchorage connectors are present, use them as well as safety harnesses.

Also, long-sleeved overalls, safety helmet, visor and safety boots must be worn at all times when working near a piece of equipment that features a hydraulic unit.

Gloves must be worn at all times when working near a piece of equipment that features a hydraulic unit. Also wear gloves to touch surfaces or tools that have become warm, but do not touch hot surfaces or tools that have become hot (more than 60°C/140°F).

LABELING OF CONTROLS AND WARNINGS

Plaques affixed to the equipment are used to label equipment controls, including emergency-stop controls, and provide specific warnings and instructions for safe, efficient use of the equipment. These plaques must remain in place and must be visible at all times.

All workers who operate the equipment must have a perfect knowledge of the location and function of all controls and must be familiar with the meaning of warnings and instructions.

TRAVEL AROUND EQUIPMENT

Use the appropriate entrance areas when going within the equipment's perimeter. Never approach the equipment unnecessarily.

Use catwalks to cross conveyors. Never step on or over a conveyor.

Never access a high, unprotected zone without a safety harness. Anchorage connectors are installed on equipment where height accesses are predictable. When anchorage connectors are present, use them as well as safety harnesses. If a part is hard to reach, use a maintenance platform or other safety equipment instead.

Never run in the workplace.

No one should enter or loiter in a bulk material storage area (bunker) or any other area located under a discharging point. Product or objects may fall and cause severe injuries. Furthermore, care should be taken when walking under or next to conveying equipment. Use the specifically designated areas to move around and under these pieces of equipment.

ELECTRICAL CABINET

Never open an electrical panel with power ON: there is an arc flash and electrical shock hazard. When work must be performed on an electrical panel with power ON, a safety perimeter must

be set in front of the electrical cabinet. Only qualified personnel wearing appropriate personal protective equipment are allowed to work on inside the safety perimeter.

CLEANLINESS AND GOOD ORDER

A clean, tidy work area helps reduce the risk of accidents. Each operator is responsible for keeping the work area in good order at all times.

Access to exit doors and electrical panels must remain unobstructed at all times.

Water, oil or another liquid can make a floor slippery and lead to falls, causing serious injuries. Always have the appropriate absorbent materials and tools on hand to keep the floor dry and safe.

ERGONOMICS

To lift a load of more than 50 lb (25 kg), use a lifting device or ask for help.

COMPRESSED AIR

Incorrect handling of compressed air is dangerous and may result in serious injury, explosions or even death.

Using compressed air may create a combustible dust cloud conducive to explosions. It is therefore highly recommended to clean and remove the dust using suction vacuum (vacuum cleaner, dedusting system, etc.) instead of compressed air.

HAZARDOUS PRODUCT HANDLING

When Premier Tech Chronos equipment is to be used for handling potentially harmful materials, always refer to the Material Safety Data Sheet (MSDS) provided by the product supplier and follow the handling, storage and disposal safety recommendations.

1.3 Operator Training

Safe and effective use of equipment requires an operator who has been specifically trained for the task.

Operator training must include a detailed review of the *Operating and Maintenance Manual*. The operator must have access to this manual at all times. Special attention must be given to the location and operation of all controls and safety devices, including emergency-stop controls and protective guards. A thorough knowledge of the safe practices in the *Operating and Maintenance Manual* is indispensable.

Ensure that the operator is fully trained on the equipment prior to being allowed to operate it.

1.4 Safe Operation

The operator must follow all *Operating and Maintenance Manual* procedures.

DANGER

Only qualified personnel with a thorough knowledge of the equipment and its *Operating and Maintenance Manual* are authorized to operate, adjust, troubleshoot and maintain the equipment.

DANGER

It is strictly forbidden to remove or disable protective guards or other safety devices, except where necessary for adjustment or maintenance purposes.

DANGER

Make sure no one is within the equipment perimeter before starting up. Watch equipment throughout the startup process.

DANGER

Make sure there is no one inside the equipment before closing a safety door, resetting a safety light curtain, an emergency-stop button or any other safety devices.

DANGER

Make sure there is no one inside the equipment before resetting the equipment.

Before using the equipment, locate all safety devices and operating controls. Make sure you understand how they work and how to use them. Never take a risk that could cause an injury.

Only use this equipment for the purpose it was designed for.

While operating equipment, the operator may encounter situations not covered in this manual. If this is the case, or if a procedure appears dangerous, the operator must shut down the equipment and immediately advise his supervisor.

If modifications are necessary, both the operator and supervisor must make sure that they understand the consequences of the steps to be taken, ensuring that they will not cause any injury. Think first, stay alert, and exercise caution.

RISK OF CONTACT WITH MOVING COMPONENTS

It is strictly forbidden to touch or enter the path of moving components, or components that are likely to start moving, such as conveyors, robots, connecting rods, mobile mechanical components, etc. The lockout procedure must have been performed before any intervention on components which are not immobilized by the activated safety system.

It is also forbidden to climb on equipment or to use a stool, stepladder or ladder to reach an elevated part of equipment when it is in operation.

SAFETY DEVICES

It is strictly forbidden to remove or disable protective guards or other safety devices, except where necessary for adjustment or maintenance purposes. Such activities must be performed on a locked equipment and by authorized personnel who will ensure that alternative safety measures are taken and all safety devices are replaced and are functional immediately after these procedures are completed.

Never use equipment if a protective guard, an emergency-stop control or any other safety device is missing. Any operator who notices such a situation must advise his supervisor, who will make sure the machine remains inoperative until the problem is corrected (see *Lockout procedure*).

Furthermore, if equipment comes with an interlock key, never take the key from a safety door lock to start the machine. Always use the same interlock key to execute the following sequence of operations: unlock a safety door, lock it again and restart the equipment. Using a duplicate key would bypass this safety system.

Should a secondary safety key released by the access system be included, it must be carried by the person as long as he/she is inside equipment.

In order to keep all door safety mechanisms in good working order, avoid banging the safety doors. To prevent damage, handle all safety mechanisms with care.

Only use an emergency-stop control to stop equipment if there is a risk of worker injury or if equipment must be stopped immediately.

At the beginning of every shift, the emergency-stop circuit and all safety devices must be checked to make sure they are working properly. Refer to the *Operation* chapter for

instructions on testing the emergency-stop circuit. Refer to the electrical diagrams to identify the safety devices.

VISUAL INSPECTION OF EQUIPMENT

The operator must always inspect equipment before startup to ensure it is in good working order. If capable, the operator must correct any breakage, blockage, leak or abnormal condition. Otherwise, he must advise his supervisor so the issue can be solved before starting up.

Equipment that is in operation must be stopped immediately if a breakage, blockage, leakage or abnormal condition is noticed. The operator must correct the problem if possible. If he cannot, he must advise his supervisor.

RISK OF A SHIFTING OR FALLING LOAD

Moving heavy loads can be necessary during operation of equipment, such as loading a new film roll. See the risks and safety measures at Section 1.1.

LOCKOUT PROCEDURE

The lockout procedure is used to prevent accidental injury or death when equipment is inadvertently started up while workers are adjusting, maintaining it or performing any other intervention involving the slightest risk. The lockout procedure also prevents the startup of defective equipment or equipment in need of repair.

DANGER

Always perform the lockout procedure before:

- ◆ making any equipment or part maintenance, repair, modification, replacement, assembly or disassembly
- ◆ taking any action involving even the slightest risk.

To lockout equipment

1. Advise the equipment operator(s) that a lockout is going to be performed.
2. Identify the machine power source(s):
 - ◆ Electrical
 - ◆ Compressed air (including tank)
 - ◆ Combustion engine
 - ◆ Hydraulic (including accumulator)
 - ◆ Gravity (including pendulum)
 - ◆ Springs

3. Shut off all possible sources of electrical power to the equipment by turning off and locking out all disconnect switches. Tag all locks according to your company's safety rules.
4. Keep the key(s) with you throughout the entire work process. Never entrust the keys to anyone else or leave them anywhere.
5. Shut off and lock out any pneumatic supply lines.
6. Release any residual energy in the equipment where applicable (compressed air, springs, hydraulic energy, gravity, etc.).
7. To make sure the equipment lockout is effective, attempt to start the machine. No machine movement should occur.

To unlock equipment

1. Advise the equipment operator(s) that power is about to be restored.
2. Make sure the equipment is back to its normal operating condition, with all protective guards and safety devices in place.
3. Perform a visual inspection to ensure that no one can be injured when power is restored.
4. Remove your lock and tag.
5. Put power back ON.

 **WARNING**

**Always stand on the side of the electrical panel
when turning the main disconnect switch to ON.**

EQUIPMENT SHUTDOWN

For an extended stop period, Premier Tech Chronos recommends to turn the main disconnect switch to off in order to prevent equipment damages.

ELECTRICAL COMPONENTS

 **DANGER**

**Every housing containing electrical components must remain closed.
If a temporary access to the housing is required, equipment
must first be locked out.**

Only qualified personnel, i.e. certified electricians, should be authorized to access the equipment.

CONFINED SPACES

Access to confined spaces for maintenance, troubleshooting or any other purpose must be done exclusively by authorized qualified personnel. Any access in such confined spaces must be preceded by the lockout procedure and must be compliant with all applicable local, provincial and national rules.

1.5 Fire and Explosion Prevention

Flammable, explosive or combustible products represent a risk of fire or explosion. The following safety measures must be taken when Premier Tech Chronos equipment may be in contact with products that are flammable, explosive or which generate combustible dust (for example highly powdery products such as flour, sugar, etc.).

DANGER

**Combustible dust accumulation can create
a fire or an explosion. Clean daily.**

INSPECTION

- Make sure that all pieces of equipment upstream from Premier Tech Chronos equipment cannot generate a source of ignition (spark, heat, electrical arc, fireball, etc.).
- Keep open flames or heat source away of Premier Tech Chronos equipment.
- Permit and training is required for hot work and electric work near Premier Tech Chronos equipment. Clean equipment before work.
- Make sure that all components which can generate an ignition source (bearings, electrical components, chains, valves, actuators, feeding screw, etc.) are in good working order and properly adjusted before starting equipment.
- Make sure all seals are working properly.
- Check that all bonding of the mechanical structure is installed and functional before operating equipment.
- Regularly inspect grounding/bonding with ohmmeter. Reading should be less than 100 ohms and ideally, less than 10 ohms.
- Make sure the bonded equipment is properly grounded. Equipment's ground must be connected to the ground of the customer's building. The ground of the electrical cabinet must be connected to the customer's electrical system. Regularly validate the presence and condition of ground wires.
- Shut off power to any damaged electrical circuit in which bare conductor wires are exposed. Repair the damage promptly to prevent sparks or fire.

- Never operate equipment if cables are damaged.
- Corded portable power tools must have a ground wire connected and must be in good working order at all times.

OPERATIONS

- Smoking is strictly prohibited around and near Premier Tech Chronos equipment.
- A working extinguisher of the appropriate class must always be within reach of the operator. It is highly advisable that you consult your local Fire Department to determine which norms apply to your equipment.
- Make sure all electrical cabinets and boxes are closed during operation of equipment.
- Avoid hot work in the presence of products that are flammable and/or explosive and/or which generates combustible dust.
- Never bring a heat source within 11 meters of the equipment, or near any products that are flammable and/or explosive and/or which generates combustible dust.
- Use antistatic bags to avoid sparks due to static electricity.
- If a dust collection unit is supplied with the equipment, ensure that it is functional at all times and that the flow/pressure requirements are met. Never operate the equipment if dust cannot be collected by the dust collecting system.

MAINTENANCE

- Clean any accumulation of product on equipment and its environment (including electrical cabinets and boxes), as well as surrounding equipment, daily.
- If a dust accumulation of more than 3 mm (1/8 in) is predictable during the operating period, a daily cleaning is insufficient. Stop equipment and clean before restarting.
- Any damaged or malfunctioning part must be replaced with a component having the same specifications and certifications as the original one.
- On a weekly basis, check the good working of mechanical components that can cause sparks and overheat due to mechanical friction (butterfly valves, cylinders, bearings, etc.).

1.6 Safety Signs

This section explains the meaning of the various safety signs affixed to Premier Tech Chronos equipment.

	MANDATORY ACTION Read and understand the <i>Operating and maintenance manual</i> before using this equipment.		MANDATORY ACTION Lockout point. Shut off and lock out this power source during the lockout procedure.
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	MANDATORY ACTION Wear Safety Harness.		MANDATORY ACTION Wear face protection, ear protection, safety overalls and safety helmet.
	MANDATORY ACTION Grounding or bonding point. Link this point to the ground.		LIFT POINT Use this point to attach lifting equipment.
	DO NOT ENTER Authorized personnel only.		STAY CLEAR Access limited to authorized personnel only.
	KEEP OUT Danger zone.		DO NOT STEP No stepping or standing on surface.
	DO NOT REACH INTO Danger zone inside.		Only operate when all protective guards are in place.
	BE ALERT Emergency-stop button nearby.		Never place hands, arms or other body parts near the zone identified by the black and yellow strips.
	Equipment starts automatically.		DO NOT TOUCH Arc flash and electrical shock hazard. Appropriate personal protective equipment required.
	KEEP CLEAR Moving parts can crush.		KEEP CLEAR Moving parts can crush.

 <p>KEEP CLEAR Moving parts can crush.</p>	 <p>KEEP CLEAR Moving parts can crush.</p>
 <p>KEEP CLEAR Moving parts can crush and cut.</p>	 <p>KEEP CLEAR Moving parts can crush and cut.</p>
 <p>KEEP CLEAR Moving parts can crush and cut.</p>	 <p>PINCH POINT HAZARD Keep clear of chain drive.</p>
 <p>PINCH POINT HAZARD Keep clear of belt drive.</p>	 <p>PINCH POINT HAZARD Keep clear of belt drive.</p>
 <p>PINCH POINT HAZARD Keep clear of rollers.</p>	 <p>PINCH POINT HAZARD Keep clear of rollers.</p>
 <p>PINCH POINT HAZARD Moving parts can crush or cut.</p>	 <p>PINCH POINT HAZARD Moving parts can crush or cut.</p>
 <p>PINCH POINT HAZARD Moving parts can crush or cut.</p>	 <p>PINCH POINT HAZARD Auger can crush or cut.</p>
 <p>BURN HAZARD Hot surface. Do not touch.</p>	 <p>FALL HAZARD Stay clear of auger area.</p>

 <p>FALL HAZARD Do not walk on conveyor in operation.</p>	 <p>ENTANGLEMENT HAZARD Stand clear of transfer area.</p>
 <p>RISK OF FALLING OBJECTS Do not walk or stand near an area where there is a risk of falling units (bags, boxes, etc.) or product.</p>	 <p>LOW CLEARANCE Wear a safety helmet in this area.</p>
 <p>RISK OF FLYING DEBRIS Wear safety glasses.</p>	 <p>LASER RADIATION Avoid eye exposure to beam.</p>
 <p>Pressurized bottle.</p>	

DESCRIPTION

2 DESCRIPTION

The **SpeedAC iQ** is a user-friendly weight controller allowing complete control of the filling process with unprecedented efficiency. Operation is carried out via a large graphic display that provides performance feedback, fine-tuning functions, statistical data, information on the system status and more.

OPERATION

3 OPERATION

This chapter provides information on the calibration and operation of the SpeedAC iQ Weight Controller for Bagging Systems.

WARNING

Only qualified personnel with a thorough knowledge of the equipment and its *Operating and Maintenance Manual* are authorized to operate the equipment.

DANGER

Always perform the lockout procedure before:

- ◆ making any equipment or part maintenance, repair, modification, replacement, assembly or disassembly
- ◆ taking any action involving even the slightest risk.

3.1 Calibration

Refer to the *Systec Calibration manual* in the **Appendix** section.

3.2 User Interface

The SpeedAC iQ user interface allows an interaction between the operator and the controller. This section describes most screens and details all operating modes of the user interface.

WARNING

Before using the equipment, locate all safety devices and operating controls. Make sure you understand how they work and how to use them.

3.2.1 General Description

This section describes displays and functions keys that are common to many screens of the user interface. It also presents the various operating mode status, the types of alarm display and the color codes used throughout the screens.

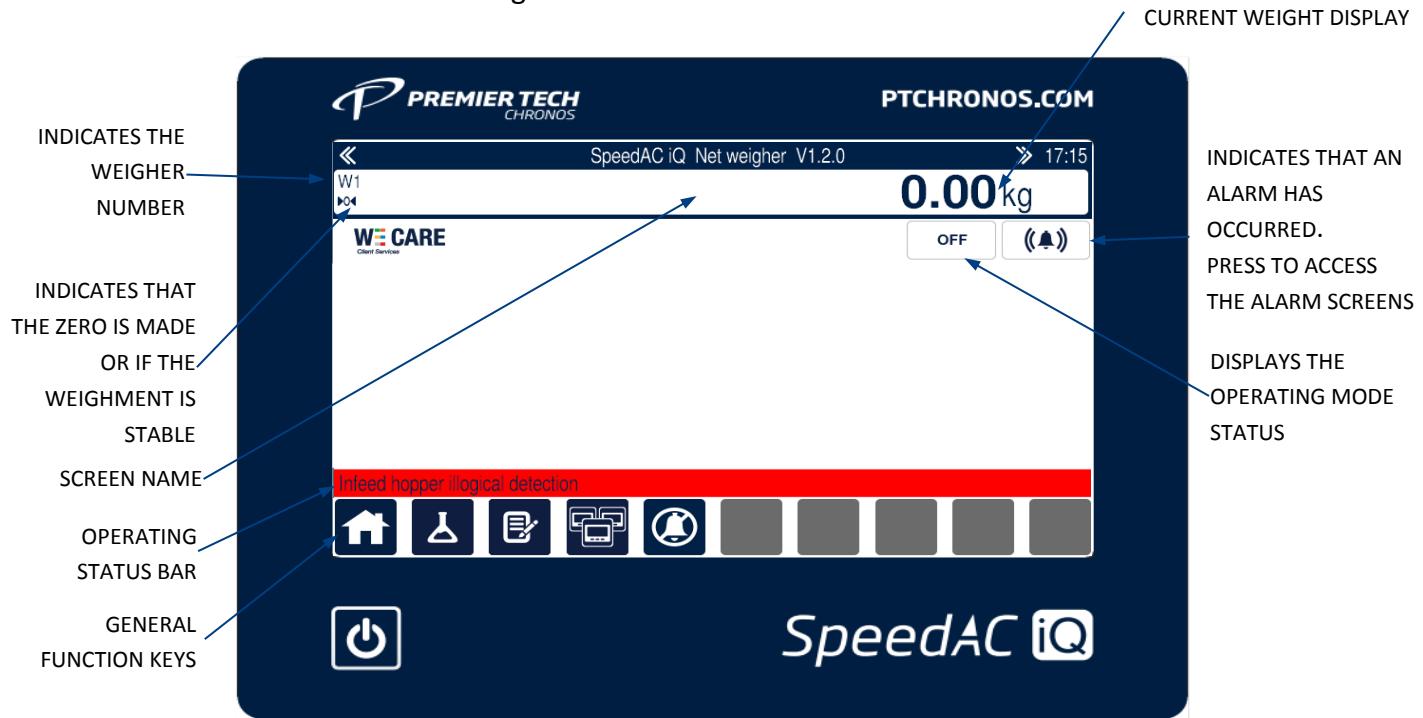


Figure 3-1 General Description

Note: Some keys are grey which means they are not accessible, depending on the type of access and operating mode.

Operating status bar

Displays the weigher operating status. When a fault is generated, the most important one is displayed.

GENERAL FUNCTION KEYS

Auto 

To access the **Automatic mode** screen in order to operate equipment automatically. Live adjustments can also be performed through this screen.

Recipes 

To access the **Recipes** screen.

Report 

To access the **Production report** screen where life time production and production since reset data is provided.

Other pages 

To access other pages and function keys. See section 3.2.2.

Clear faults 

To clear alarms that have been corrected.

Manual discharge 

To perform a manual discharge. This parameter becomes available only when the equipment is not in automatic cycle.

Discharge underweight 

To accept an weighment even if it is underweight and perform a manual discharge.

Discharge overweight 

To accept an weighment even if it is overweight and perform a manual discharge.

Cancel feeding cycle 

To cancel the feeding cycle if it is too slow.

Off 

To put the equipment in OFF mode. The OFF mode is the basic mode when the equipment is switched on. In that mode, no operation is possible and no function is available.

Fill hopper 

To fill the hopper. The hopper will be refilled when the low level sensor is activated.

Empty hopper 

To empty the hopper. The hopper will not be refilled when the low level sensor is activated.

Note: Once the low level sensor is activated in **Empty hopper** mode, the scale precision will be low for the following weighments and the last weighment may be underweight since product will be missing.

Start 

Starts the equipment in automatic mode. It is also used to resume feeding cycle in Hold.

Stop 

Stops the equipment in automatic mode. When this key is pressed, the cycle in progress comes to a stop. All actions will be completed, but no new cycle begins.

Previous and next  

To return to the previous screen and go to the next one.

Unapproved weight display 

This icon appears when weight display banner is not visible in this screen. The weight display banner is approved by the weight and measure regulations.

OPERATING MODE STATUS

In the right upper part of the screen, a display indicates the current operating mode or the status of the operating mode. Clicking on the mode status icon will bring the **Auto** screen.



No operation is possible and no function is available.



The equipment is in a preparation period. The equipment is performing a preparation cycle to go safely to the automatic mode.



The equipment is running in automatic mode.



The equipment is currently stopping. The **Stop** key has been pressed, but certain modules continue to operate until the cycle in progress is completed.



The equipment is stopped in automatic mode.



The equipment is in manual discharge mode.

ALARM STATUS

In the right upper part of the screen, a display indicates the type of alarm the controller has generated. Refer to the **Alarms** screen section 3.2.13 for more information. Clicking on the status icon will bring the **Alarm history** screen.



The controller has generated a warning.



The controller has generated a fault.



The controller has generated no fault.

3.2.2 Other Pages and Functions

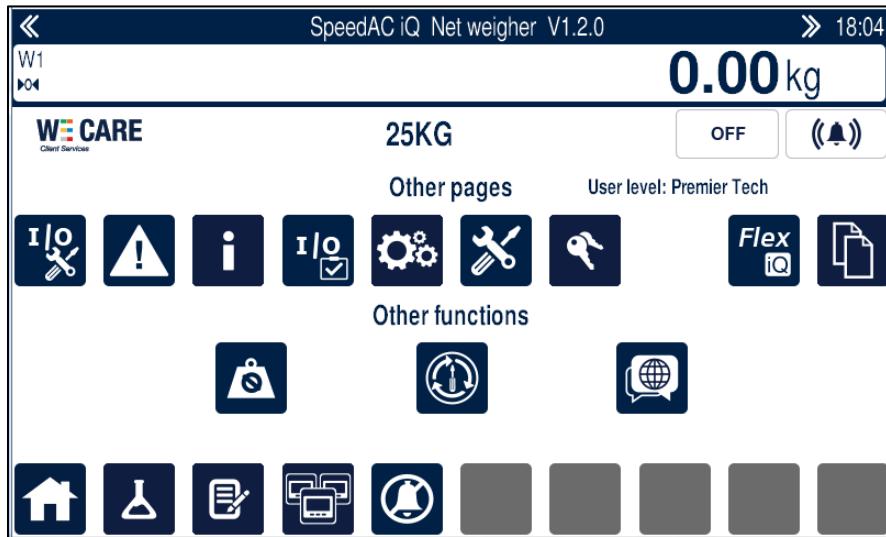


Figure 3-2 Other Pages/Functions

Note: Some keys are grey which means they are not accessible, depending on the type of access and operating mode.

User level

Displays the user level (operator, supervisor, Premier Tech).

OTHER PAGES

I/O configuration 

To access the **I/O configuration** screens, where the mapping of inputs and outputs are displayed.

Fault history 

To access the **Fault history** screen.

Info 

To access the **Information** screen.

I/O Test 

To access the **I/O test** screen, where the status of inputs and outputs are provided.

Machine configuration 

To access the **Machine configuration** screens.

Machine parameters 

To access the **Machine parameters** screens.

Access page 

To display the **Access** screen in order to change the type of access. A password is required to change data in some screens.

Flexible I/O's 

To access the **Flexible I/O's** screen.

Weigh program management 

To access the **Weigh program management** screen.

OTHER FUNCTIONS**Check all** 

To check (sample) all weighments.

Release 

To check weighments according to the sampling variables (**Sample frequency** and **Sample size**).

Auto tune 

To force the Smart iQ algorithm to auto adjust. This icon turns yellow while auto tuning is in process.

Language 

To change the HMI languages selected in the **Machine configuration 1** page. The selection will toggle between the 3 chosen languages.

3.2.3 Information Screen

The **Information** screen displays information about the equipment and Premier Tech after-sales service (according to the business unit that will supply the after-safe service). Most of this information should be entered in the **Machine configuration** screens by Premier Tech technicians.



Figure 3-3 Information screen

Note: Some keys are grey which means they are not accessible, depending on the type of access and operating mode.

3.2.4 Access

A password is required to access some screens and to change data; without this password, the values can only be read. Press the **Access** function key to display the **Access** screen.

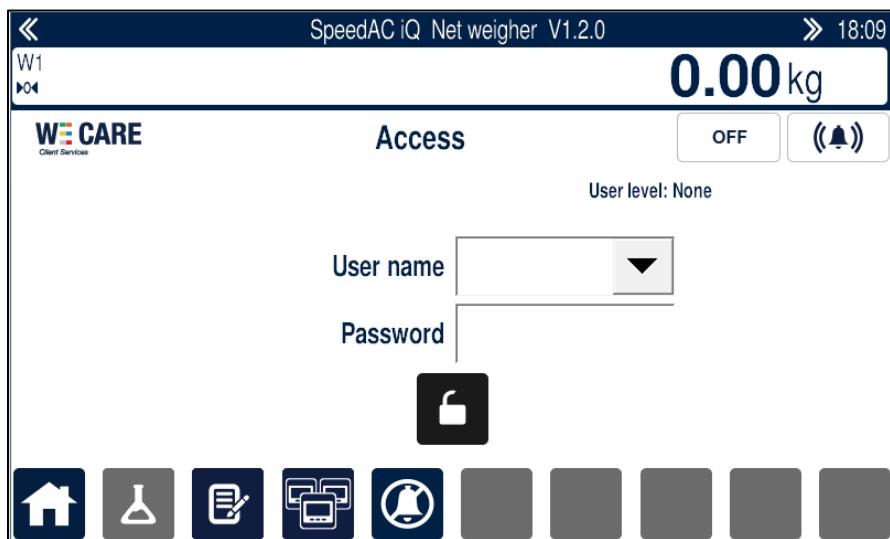


Figure 3-4 Access screen

Note: Some keys are grey which means they are not accessible, depending on the type of access and operating mode.

FUNCTION KEYS

User name

To select the access level (operator, supervisor, Premier Tech).

Password

To enter the password (corresponding to the desired access level). To deactivate the password and return to a READ ONLY access, press the padlock key.

Password level	Actions allowed
None	Start equipment only (not logged in).
Operator	Start equipment, change recipes, modify recipes, Settings screens.
Supervisor	Start equipment, change recipes, modify recipes, Settings screens and reset user password.
Premier Tech	Tech Tuning screens reserved for Premier Tech technician only.

Padlock key 

To activate and deactivate the password.

3.2.5 Automatic mode

The **Automatic mode** screen allows operating the equipment automatically and to view operating variables.



Figure 3-5 Automatic mode screen

Note: Some keys are grey which means they are not accessible, depending on the type of access and operating mode.

Weigh program display (Weigh program / Recipe)

Name of the current **Weigh program**.

To choose the desired **Weigh program**, press **Recipe** to display the program list. This action is possible only when the equipment is in **Off** mode and if the operator is logged in.

Target weight

Weight of product in a weighment (**Overfill** included), based on weigh program settings.

Average

Average weight of all weighments that have occurred since the **Start** key has been pressed.

Standard deviation

Measure of the dispersion of weighments. This measure is linked to the **Average**.

Last checked

Weight of the last weighment.

Units accepted

Number of units within weigh limits since reset.

Note: Underweight and overweight units are not registered as it is assumed that they will be removed from the units within weigh limits.

Weighments/unit

Number of weighments completed / number of weighments necessary to fill a unit, as specified in the selected **Recipe**, based on weigh program settings.

Units done

Number of units done, including the ones out of tolerance.

Presets/unit

To indicate the remaining number of units to be filled in the current batch.

Weighments/minute

Number of weighments done per minute.

Bulk time

Time in bulk feeding.

Dribble time

Time in dribble feeding.

Cycle time

Displays the current cycle time.

FUNCTION KEYS

Zero (not used in net weighing applications) 

To zero the weigher so that it indicates 0 when the quantity to be measured is also 0.

Approved weight storage (to be used by qualified service technicians only) 

To access system pages.

3.2.6 Recipe

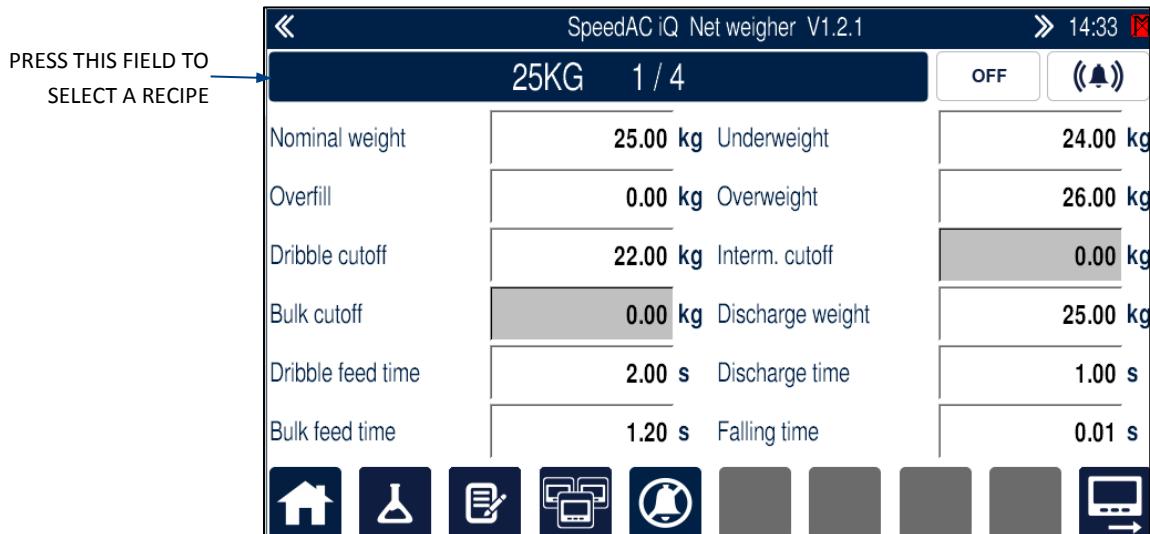


Figure 3-6 Recipe screen (Page 1)

Note: Some variables are grey which means they are not accessible, depending on the algorithm and feeder type.

Nominal weight

Weight of product in a weighment (**Overfill** not included).

Overfill (0 – 2% of the maximal weight)

This value is added to the **Nominal weight** in order to set the weigh scale so that no weighment will fall below the **Nominal weight** and the product give-away will be minimized.

Dribble cut off

Weight where the product dribble feed cuts off.

Bulk cut off

Weight where the product bulk feed cuts off.

Dribble feed time (0 – 1 800 s)

Optimum period of time required to achieve the **Dribble feed** part of the feeding. The **Bulk cutoff** weight is adjusted by the controller in order to achieve this timer value. It depends on the **Bulk cutoff correction** parameter in the **Machine parameter** screen.

Bulk feed time

If **Feed algorithm type** is set to **Standard** and if **Standard bulk mode** is set to **By time** (in **Recipe 3** screen), this timer allows to set the bulk feeding phase duration.

Underweight (-8% of the maximal weight from the Nominal weight to the Nominal weight)

Lower limit of product weight. Weighments under this tolerance will generate a fault and it will be assumed to be removed, so not counted in the accepted weighment.

Overweight (Nominal weight to 8% of the maximal weight.)

Upper limit of product weight. Weighments over this tolerance will generate a fault and it will be assumed to be removed, so not counted in the accepted weighment.

Intermediate cut off (0 - the Dribble feed weight value)

Weight where the product intermediate feed cuts off.

Discharge weight (0 - Nominal weight)

Weight from which the DISCHARGE DOOR will be deactivated.

If the **Discharge weight** is equal to the **Nominal weight**, the product is discharged only according to the **Discharge time** value.

Discharge time (0 to 60 s)

Time during which the product will be discharged on a timer. As long as this value is not reached, the product is discharged by timer; when it is reached, the product is discharged by weight if the discharge weight is less than the **Nominal weight**.

Falling time (0.01 - 50 s) (for the BAG HOLDER (option) activated)

Time the product takes to travel the distance between the weigh scale and the BAG HOLDER (option) jaws. This timer starts when the DISCHARGE DOOR starts closing.

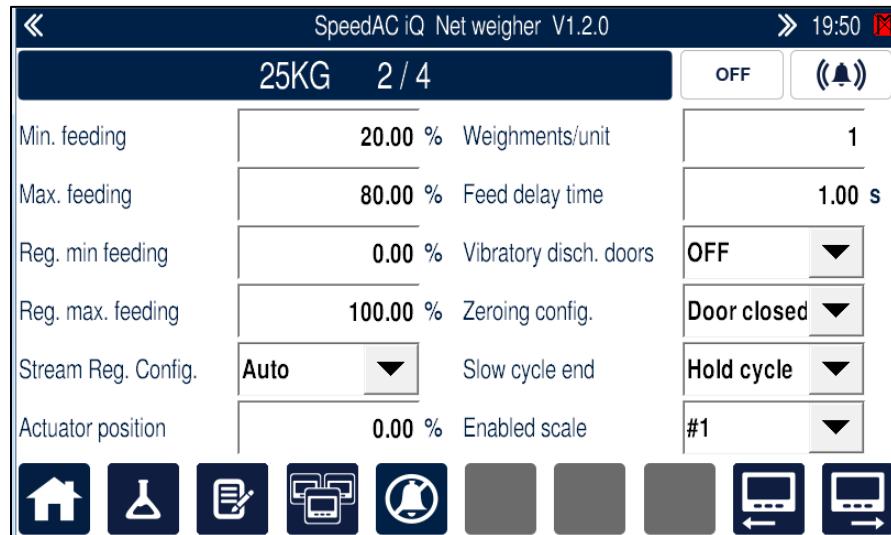


Figure 3-7 Recipe screen (Page 2)

Note: Some variables are grey which means they are not accessible, depending on the algorithm and feeder type.

Minimum feeding (0 – 80%)

For High Speed Belt FEEDER or High Speed Gravity FEEDER. Minimum setting under which the weigh scale FEEDER cannot run during the dribble feeding for a given weigh program. This parameter should be set to have a minimum regular flow of product.

For Gravity FEEDER, Vibratory FEEDER, Belt FEEDER or HIGH SPEED Belt FEEDER. Setting at which the weigh scale will run during the dribble feeding for a given weigh program. This parameter should be set to have a minimum regular flow of product.

Maximum feeding (0 – 100%)

Setting at which the weigh scale FEEDER will run during the bulk feeding for a given weigh program. This parameter should be set to reach the cycle speed desired.

Regulator minimum feeding (0 – 100%) (for high speed belt feeder)

Minimum setting under which the product stream regulator cannot run for a given weigh program. This parameter should be set to have a minimum regular flow of product.

Regulator maximum feeding (0 – 100%) (for high speed belt feeder)

Maximum setting over which the product stream regulator cannot run for a given weigh program. This parameter should be set to reach the cycle speed desired.

Stream regulator configuration (for belt weigh scale and high speed belt weigh scale)

Control mode of the product stream regulator.

- High** The product stream regulator is in high position except during the cut-off weight.
- Low** The product stream regulator is in low position.
- Auto** The product stream regulator is in high position during the bulk feeding. It is in low position during the dribble feeding and when it is stopped.

Actuator position (0 – 100%)

Setting at which the actuator (option) will position the module attached to it, during the preparation sequence, according to the current **Weigh program** needs.

Weighments/unit (1 – 99 999)

Number of weighments per unit.

This parameter value has to be set to 1 for normal single weighment operation. This parameter has to be set to the required number of weighments if more than one weighment is to be discharged into one unit (bag).

If a sequence of weighments within the preset value is aborted, the next weighment becomes the first weighment of a new unit, the weighment interlock signal is given and the unit must be manually removed from the system as it contains an incorrect number of weighments.

If any weighment of a multi-weighment unit causes a weight error of any kind, the unit is discharged and must be manually removed from the system.

Note: For big bags functionality: if more than one **Weighment/unit** is set, and the **Sample size** and **Sample frequency** parameters are set to the same value, all weighments will be verified and added. The last weighment will be adjusted to achieve the results of the **Nominal weight** plus the **Overfill**, times the **Weighment/unit** value. The **Overweight** and/or **Underweight** final values will be the results of the **Weighment/unit** times the **Overweight** and/or **Underweight** values.

Feed delay time (0 – 60 s)

Delay during which the catch gate will stay closed and the feeder will remain stopped after sending the DISCHARGE DOOR close signal following a discharge operation.

Vibratory discharge doors

To activate (ON) or deactivate (OFF) the vibration of the DISCHARGE DOOR.

Zeroing configuration

To set the position of the door (open/closed) in which the zero of the scale will be done.

Slow cycle end

To set the action to end the actual weighment (switch to **Dribble feed**, **Hold cycle** or **End cycle**) once the **Slow cycle time** parameter (in the **Machine parameter** screen) is done.

Enabled scale

To select scale #1, #2 or both for the current weigh program.

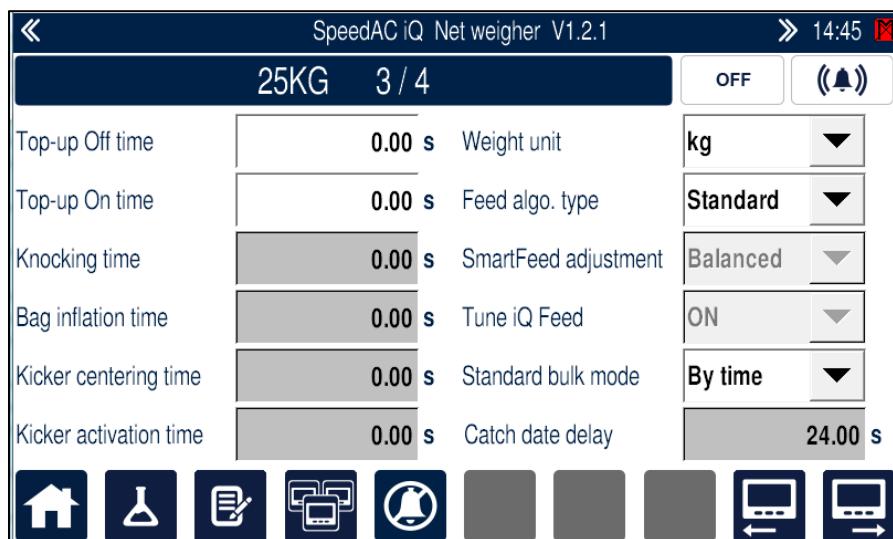


Figure 3-8 Recipe screen (Page 3)

Note: Some variables are grey which means they are not accessible, depending on the algorithm and feeder type.

Top-up OFF time (0 - 10 s)

Time during which the Dribble Feed and Catch Gate outputs will be deactivated after the **Top-up ON time** is done.

Note: The top-up function is activated until the weighment reaches the **Underweight** value.

Top-up ON time (0 - 10 s)

Time during which the Dribble Feed and Catch Gate outputs will be activated when the verified weight is below the **Underweight** value.

Note: The top-up function is activated until the weighment reaches the **Underweight** value.

Note: The correction of the cut off weight will be made based on the first weighment verification.

Knocking time (0 to 120 s)

Duration of the knocking sequence in order to compress the product after evacuation.

Bag inflation time (0 - 60 s) (for the BAG HOLDER (option) activated)

Duration of the bag inflation to fill the bag with air in order to form it.

Kicker centering time (0 - 60 s) (for the BAG KICKER (option) activated)

Duration of the bag travelling into the Kicker module in order to center it.

Kicker activation time (0 - 60 s) (for the BAG KICKER (option) activated)

Duration of the bag Kicker module activation in order to push the bag correctly.

If "0" is entered AND the input "Kicker Retracted" is configured, the BAG KICKER will be activated until input is OFF and return to ON, expecting the module to be a rotating mechanism.

Weight unit

To select the weighing unit for a specific recipe.

Feed algorithm type (Standard, Smart iQ, Flash iQ, Sim iQ)

To select the algorithm in use. The **Standard** algorithm has standard setpoints to change the various filling speed of the machine, The **Smart** algorithm monitors the flows to automatically manage rapid and precise weighments and the **Flash** algorithm is used for the gravity high speed feeder. **Sim** is used to dry run the machine at Premier Tech factory.

Smart feed adjustment (++Accurate, +Accurate, Balanced, Faster, Fastest)

To select the smart feed adjustment type.

Tune iQ feed

If ON, the **Smart** or **Flash** algorithm will run the learning process every time this **Weigh program** is started. If OFF, the algorithm will use the already learned parameters for a quicker startup. It should be OFF only if product flow is very constant and repeatable from one batch to the other.

Standard bulk mode (only used in Standard feed algorithm type)

When set to **By time**, it allows the bulk feeding phase to be controlled by time. Set the **Bulk feed time** parameter to control it.

When set to **By weight**, it allows the bulk feeding phase to be controller by weight. Set the **Bulk cutoff** parameter to control it.

Catch gate delay (0 – 5 s)

Delay before closing the catch gate. If this parameter is set to the maximum, the catch gate stays continuously open during production.



Figure 3-9 Recipe screen (Page 4)

Flexible T1

Available timer 1 preset value used for flexible I/Os programming.

Flexible T1

Available timer 2 preset value used for flexible I/Os programming.

Flexible counter

Available counter preset value used for flexible I/Os programming.

Flexible SP1

Available setpoint 1 used for flexible I/Os programming.

Flexible SP2

Available setpoint 2 used for flexible I/Os programming.

3.2.7 Weigh program management

The **Weigh program management** screen displays the weigh program currently used. A weigh program (recipe) is comprised of the parameters values used to weigh one or many selected products. This screen includes the copy tool in order to rename or copy weigh programs. The **Weigh program management** functions are available in OFF mode only.

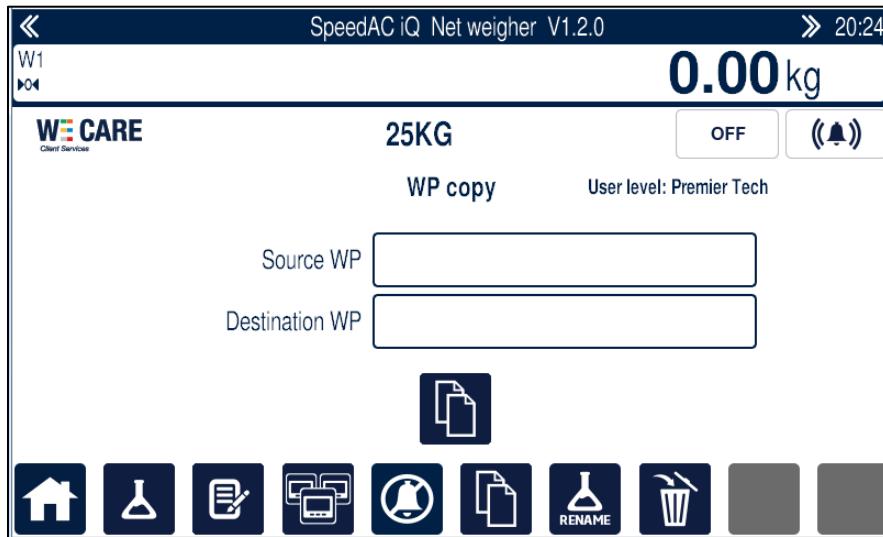


Figure 3-10 Weigh program management screen (COPY)

Source weigh program

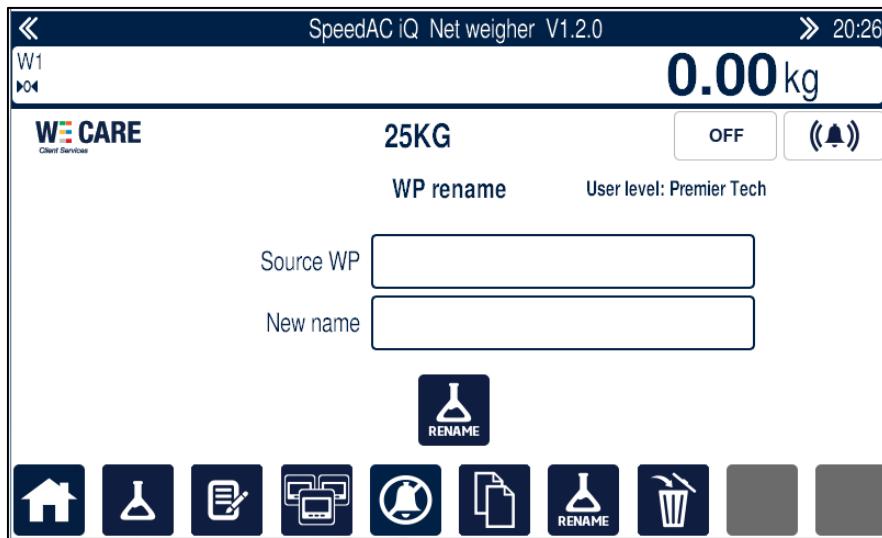
Press the selection field to choose the **Weigh program** name source (which weigh program will be copied to create a new one).

Destination weigh program

Press the selection field to choose the **Weigh program** name destination (where the weigh program will be copied).

To COPY A WEIGH PROGRAM/RECIPE

1. Select the **Source weigh program**.
2. Select the **Destination weigh program**.
3. Press **Copy**. 

TO CHANGE A RECIPE NAME**Figure 3-11 Weigh program management screen (RENAME)**

1. Select the **Source weigh program Name**.
2. Enter the **New name**.
3. Press **rename**. 

TO DELETE A RECIPE**Figure 3-12 Weigh program management screen (DELETE)**

1. Select the **Weigh program** to delete.
2. Press **Delete**. 

3.2.8 Production report

The **Production report** screen displays, on the left side, data related to the active Weigh Program since reset and, on the right side, the production data accumulated since the first use of the weigh scale.

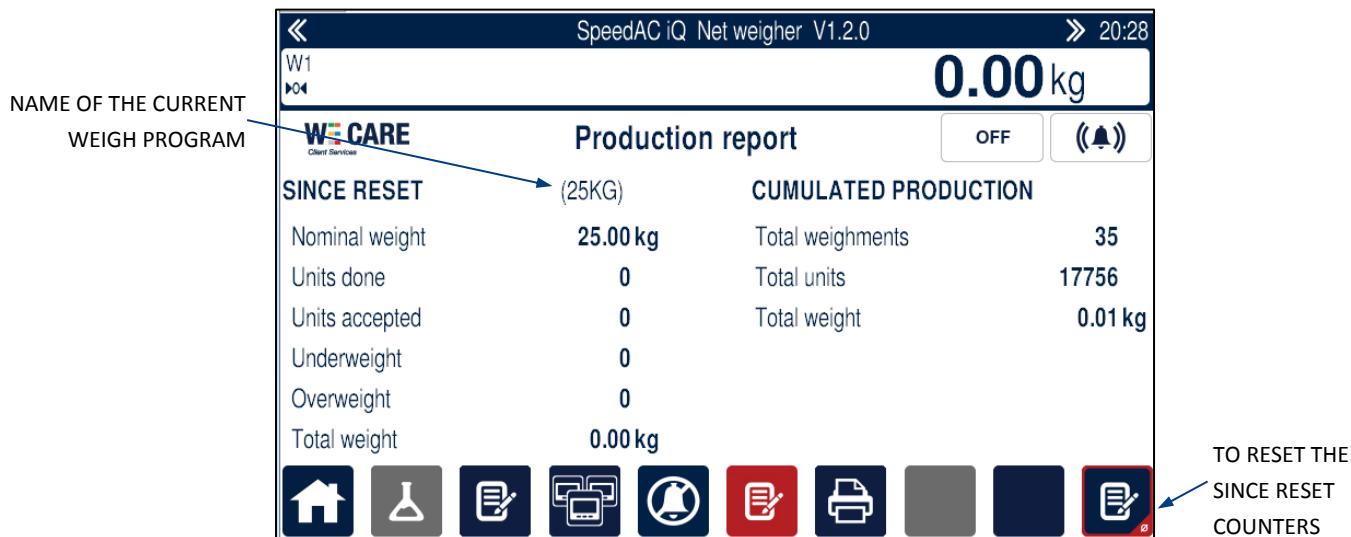


Figure 3-13 Production report screen

SINCE RESET

Nominal weight

Weight of product in a weighment (**Overfill** not included).

Units done

Total number of units done since reset.

Units accepted

Number of units done within weigh limits.

Note: Underweight and overweight weighments are not registered as it is assumed that they will be removed from the units within weigh limits.

Underweight

Number of weighments (since reset) weighing less than the low tolerance limit.

Overweight

Number of weighments (since reset) weighing more than the high tolerance limit.

Total weight

Weight of stocked product since reset. This value is the multiplication of the **Accepted weighments**, **Nominal weight** and **Weighment/unit** values.

CUMULATED PRODUCTION

Total weighments

Number of weighments done since the last software update.

Total units

Number of units done since the last software update.

Total weight

Weight of stocked product since the first use of the weigh scale.

FUNCTIONS KEYS



To reset the since reset counters.



To access the **Batch configuration** and report screen.



To print the current **Report** page (option).



Figure 3-14 Batch report screen

Batch name

Enter the desired batch name.

Preset

Enter the desired batch preset.

Units done

Number of units completed for the current batch.

Units accepted

Number of units accepted for the current batch.

Underweight

Number of underweight units for the current batch.

Overweight

Number of overweight units for the current batch.

Details

Enter the text details for this batch.

Total weight

Total cumulated weight for the current batch.

Minimum accepted

Minimum accepted weight for the current batch.

Maximum accepted

Maximum accepted weight for the current batch.

Residue weight

Total residue weight for the current batch.

Standard deviation

Standard deviation weight for the current batch.

Average

Average weight for the current batch.

3.2.9 Machine parameters

The **Machine parameters** screen displays all functional parameters of the weigh scale. A password is required to access this screen.

If the value entered is too low or too high, the controller will automatically adjust it to the closest minimum or maximum value.

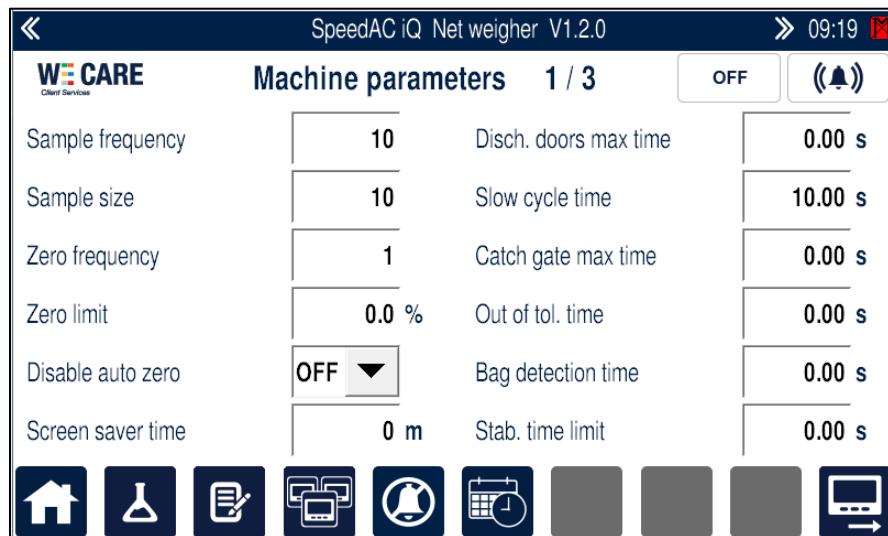


Figure 3-15 Machine parameters (Page 1)

Note: Some variables are grey which means they are not accessible, depending on the algorithm and feeder type.

Sample frequency (1 – 9 999 999)

Frequency at which the samples are taken and the zero is done depending on the zero frequency parameter.

Sample size (1 – Sample frequency)

Number of consecutive weighments to be checked within any sample.

Note: For example, if it is required to check 2 out of every 6 weighments, the **Sample frequency** is set to 6 and the **Sample size** to 2.

Each sample weighment is allowed to stabilize and the accurate cut-off data thus obtained is used to modify the **Cut off weight** parameter.

Zero frequency (1 – the result of maximal Sample frequency divided by the Sample frequency)

Frequency of the **Sample frequency** at which the zero is done.

Zero limit (0 – 100%)

Maximal percentage of the maximal weight at which the zero can be done. If in OIML application, it is set at 1.9%.

Disable auto zero

If disabled, the automatic zeroing will be performed according to the **Sample frequency** variable. If enabled, the operator will have the control of the zero manually.

Screen saver time (Light off of service mode)

If terminal is not in use, the backlighting is switched off after this time has elapsed (in minutes). Touch the screen to switch backlighting on again. Enter 0 to disable this function. Power cycle is required for this value to take effect.

Discharge door maximum time (0 – 99 s)

Period of time allowed closing the DISCHARGE DOOR. If this timer elapses before the door is closed, a fault is generated and the next feed cycle is postponed.

Slow cycle time (0 – 1800 s)

Timer starting at the beginning of the feed phase up to the discharge phase. If it expires before the completion of the phase, a fault is generated.

Note: Depending on the setting of the **Slow cycle end** parameter (in the **Recipe** screen) the feeder will switch to **Dribble feed** speed, will **Hold cycle** or **End cycle** when the **Slow cycle time** parameter is done.

Catch gate maximum time (0 – 5 s)

Period of time allowed opening the catch gate. If this timer elapses before the catch gate is open, a fault is generated and the next feed cycle is postponed.

Out of tolerance time (0 – 1200 s)

Time during which an **Overweight** or **Underweight** weightment will be displayed before the product is automatically discharged. If this parameter is set to more than 0 second, the operator does not have to press the **Discharge underweight** or **Discharge overweight** keys in order to accept this weightment.

Bag detection time (0 – 60 s)

Maximum time allowed detecting an empty bag.

Stabilization time limit (0.01 – 20 s)

Time during which the weight stabilization should occur.

FUNCTIONS KEYS

Set time and date



To set the time and date through the **Time & date management** screen.

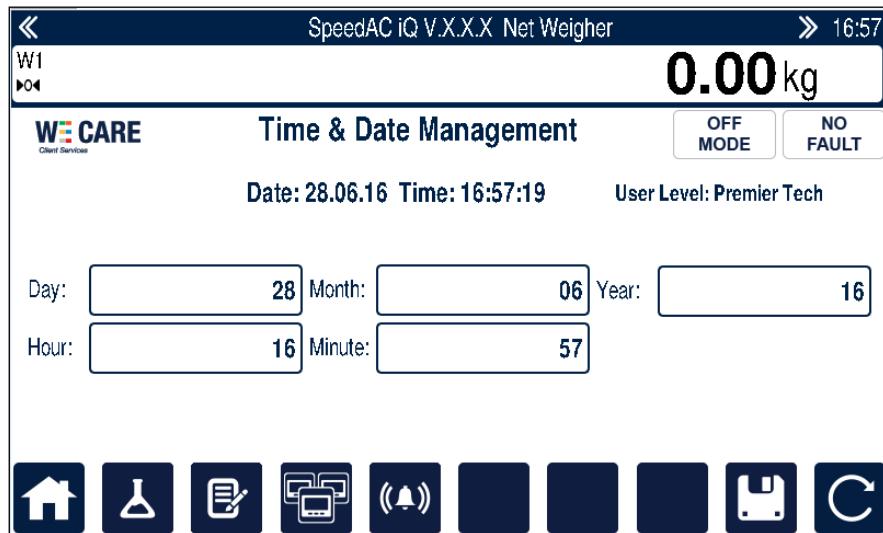


Figure 3-16 Time & date management screen

FUNCTIONS KEYS

Set time and date 

To permanently save all changes made in the screen.

Refresh 

To copy the system values into the boxes.

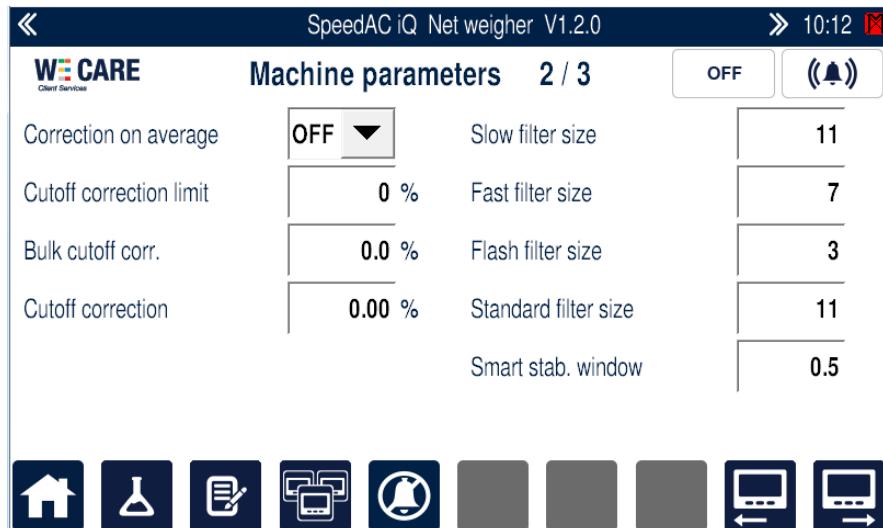


Figure 3-17 Machine parameters (Page 2)

Note: Some variables are grey which means they are not accessible, depending on the algorithm and feeder type.

Correction on average

To activate (ON) or deactivate (OFF) the correction on the average of the sample weighment.

Cut off correction limit (0 – 100%)

Maximal percentage from the **Nominal weight** at which the cut off weight can be corrected.

Bulk cut off correction

Correction factor allowing adjusting the **Bulk cut off** value in order to obtain the desired **Dribble feed time**. The higher the value, the greater the compensation.

Cut off correction

Correction factor allowing adjusting the **Dribble cut off weight** value once after each unit of the sample in order to obtain the desired weight. The higher the **Cut off correction** value, the greater the compensation.

Slow filter size (used with Smart iQ algorithm)

To change the weigh filter size for slow filling (dribble).

Fast filter size (used with Smart iQ algorithm)

To change the weigh filter size for fast filling (bulk).

Flash filter size (used with Flash iQ algorithm)

To change the weigh filter size for flash filling.

Standard filter size (used with Standard algorithm)

To change the weigh filter size for Standard filling.

Smart stability window (used with Smart iQ algorithm)

To change the stable duration of the slow portion of the Smart filling. This time correspond to the **++ Accurate** of the **Smart feed adjustment** of the **Weigh program**. Increasing this value extend the dribble time but is sometimes needed to ensure flow stability for weight reading precision.

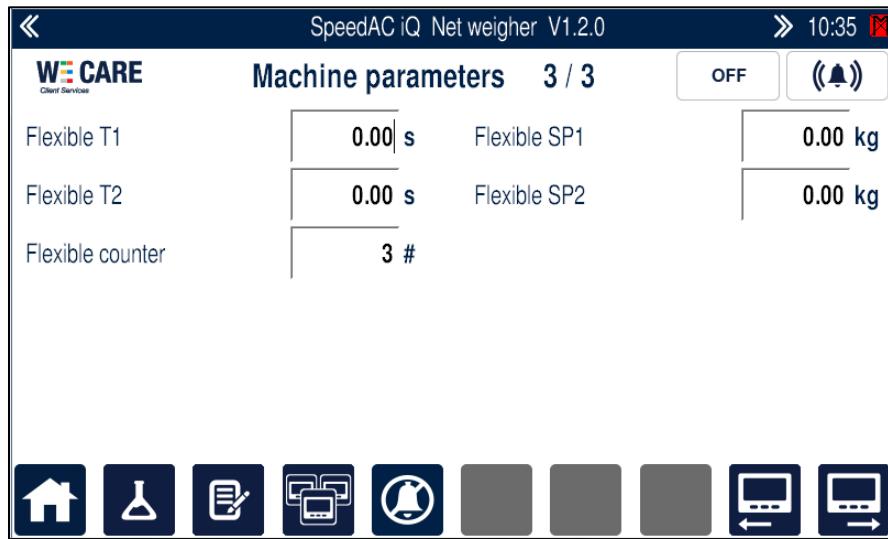


Figure 3-18 Machine parameters (Page 3)

Flexible T1

To set the timer 1 preset value used for flexible I/Os programming.

Flexible T2

To set the timer 2 preset value used for flexible I/Os programming.

Flexible counter

To set the counter preset value used for flexible I/Os programming.

Flexible SP1

To set the setpoint 1 used for flexible I/Os programming.

Flexible SP2

To set the setpoint 2 used for flexible I/Os programming.



Figure 3-19 Machine parameters (Save/restore default)

Save machine parameters 

To permanently save all **Machine parameters** to default location (Premier Tech Only).

Restore default parameters 

To copy the default parameters into the **Machine parameters** values (Premier Tech Only).

3.2.10 Machine configuration

The machine configuration must be performed during initial commissioning of the weighing system and after a major change to the controller. To access this screen, enter a valid password.

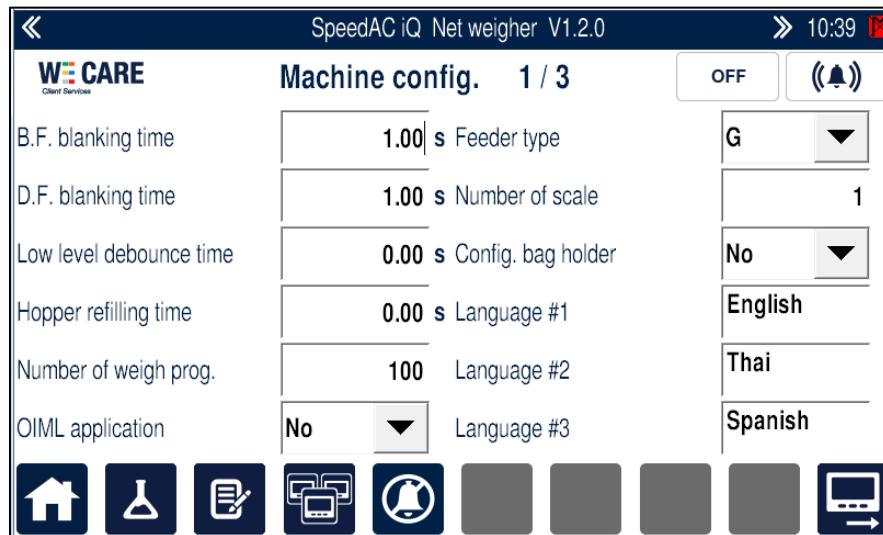


Figure 3-20 Machine configuration (Page 1)

Note: Some variables are grey which means they are not accessible, depending on the algorithm and feeder type.

Bulk feed blanking time (0 - 5 s)

At the start of the Bulk Feed Phase, the shock load of the product column hitting the WEIGH PAN could cause an apparent feed cut-off weight. To prevent this situation from happening, the controller ignores the weight signal until the **Bulk feed blanking time** has elapsed.

Dribble feed blanking time (0 – 5 s)

At the start of the Dribble Feed phase and Intermediate Feed phase, the controller ignores the weight signal until the **Dribble feed blanking time** has elapsed.

Low level debounce time (0.01 – 50 s)

Time during which the low level sensor will be cleared before the fault INFEED HOPPER LOW LEVEL occurs.

Hopper refilling time (0 – 7 200 s)

Time during which no refilling request is sent to the product feeding system even if the high level sensor is no more obstructed. When set to zero, the refilling request will be sent as soon as the product reaches the low level sensor.

Number of weigh programs (0 – 100)

Number of defined weigh programs. There are 100 weigh programs available, this setting limits the quantity displayed.

OIML application

To activate (ON) or deactivate (OFF) if the application is OIML approved. If it is ON, the **Zero limit** is set to 1.9% and the **Disable auto zero** is forced to OFF.

Feeder type

To set the feeder type.

Number of scale

To set the number of scale.

Configuration bag holder

To set the bag holder configuration.

Languages

Desired languages of the user interface.

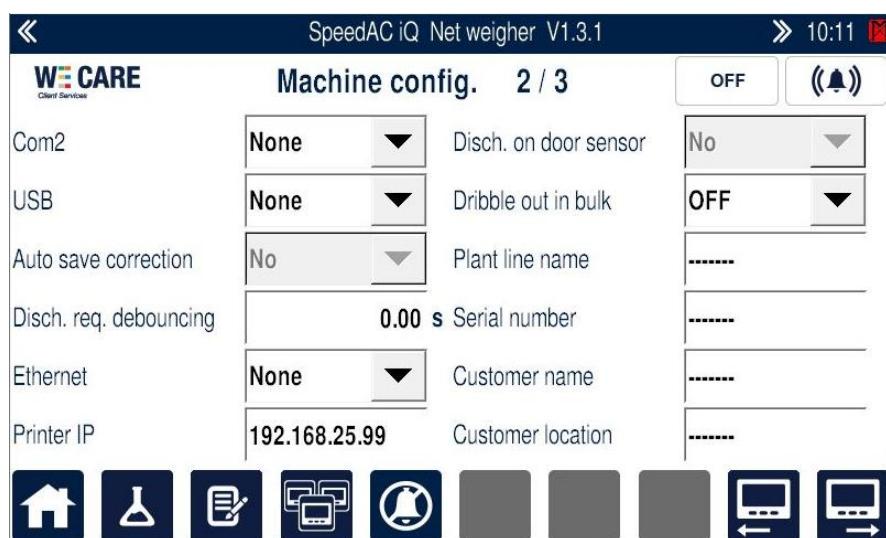


Figure 3-21 Machine configuration (Page 2)

Note: Some variables are grey which means they are not accessible, depending on the algorithm and feeder type.

Com2

To choose the printing/reporting option for port **Com2**. Choose from **Continuous output**, **Unit record string**, **Unit record file**, **Report to printer**, or select **None** to disable this parameter. Refer to the *Appendices* section for more information.

USB

To choose the printing/reporting option for port **USB**. Choose from **Continuous output**, **Unit record string**, **Unit record file**, **Report to printer**, or select **None** to disable this parameter. Refer to the *Appendices* section for more information.

Auto save correction

To activate (YES) or deactivate (NO) the auto save correction of the **Dribble cut off** weight and of the **Bulk cut off** weight. If it is set to YES, at each automatic correction, it will be saved in the weigh program. If it is set to NO, the corrections will be made for the current batch only. Then, it will be reset for the next batch.

Discharge request debounce (0 to 0.5 s)

Time during which the discharge request should be activated in order to take the signal into account.

Ethernet

To choose the printing/reporting option for port **Ethernet**. Choose from **Continuous output**, **Report to printer**, or select **None** to disable this parameter. Refer to the *Appendices* section for more information.

Printer IP

To enter the printer IP Address. Refer to the *Appendices* section for more information.

Discharge on door sensor

To manage the discharge interlock signal. When this parameter is set to **Yes**, the discharging time will start when the discharge starts to open (or when the door close sensor is no more activated). When this parameter is set to **No**, the discharging time will start when the door opening valve is activated.

Dribble out in bulk

To set if the Dribble output will be **On** or **Off** during the bulk filling sequence.

Plant line name / Serial number / Customer name / Customer location

Customer specific machine information.

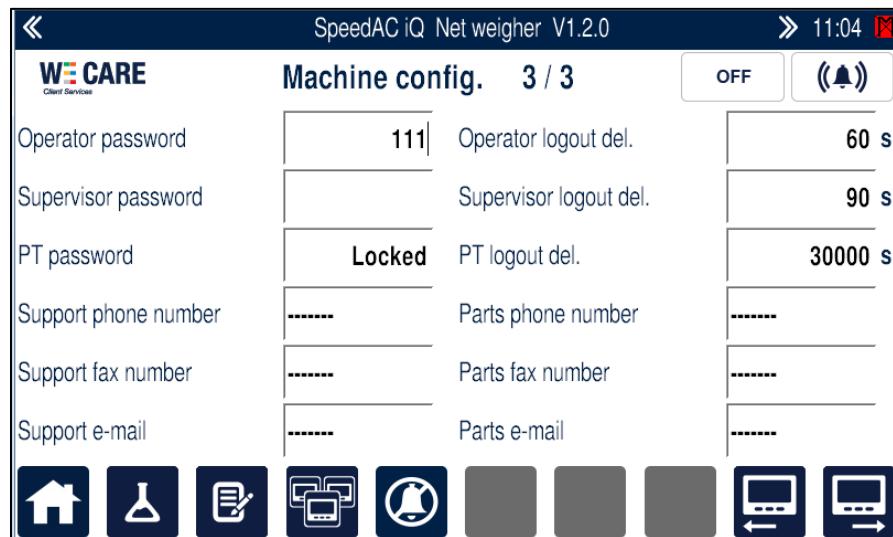


Figure 3-22 Machine configuration (Page 3)

Note: Some variables are grey which means they are not accessible, depending on the algorithm and feeder type.

Operator / Supervisor / Premier Tech password

To change passwords. A valid password is necessary to do so.

Support phone / Fax number / E-mail

Displays Premier Tech service department information.

Operator / Supervisor / Premier Tech logout delay

To set the passwords logout delay.

Parts phone / Fax number / E-mail

Displays Premier Tech parts department information.



Figure 3-23 Machine Configuration (Save/Restore default)

Save machine configuration



To permanently save all **Machine configuration** to default location (Premier Tech Only).

Restore default configuration



To copy the default configuration into the **Machine configuration** values (Premier Tech Only).

3.2.11 Configuration

The **I/O configuration** screens display the mapping of input and output addresses (0 to maximum of I/Os configured in the Service Mode).

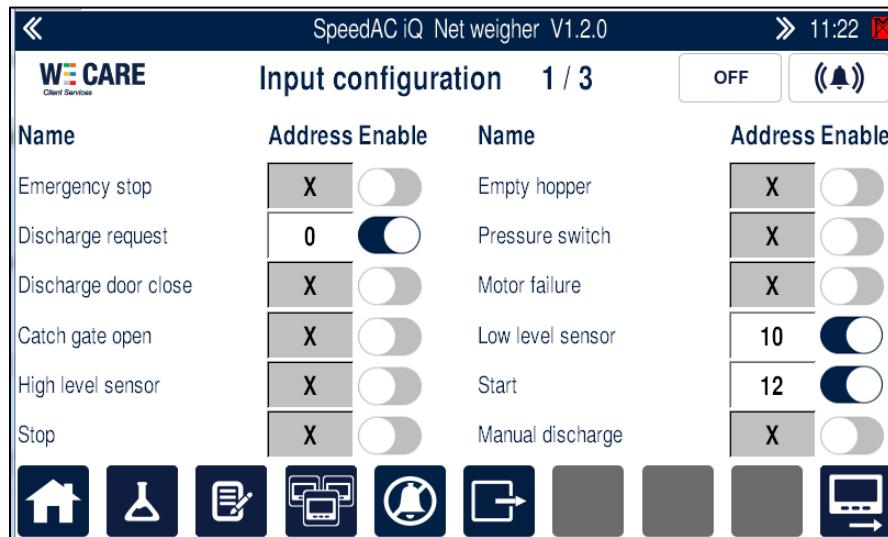


Figure 3-24 Input configuration (Page 1)

Input

To access the **Input configuration** screen.

Output

To access the **Output configuration** screen.

« SpeedAC iQ Net weigher V1.2.0 » 11:23 X

WE CARE Client Services

Input configuration 2 / 3

Name	Address Enable	Name	Address Enable
Dribble feed only	X <input type="checkbox"/>	Bag detected at kicker	0 <input checked="" type="checkbox"/>
OK for bulk feed	X <input type="checkbox"/>	Kicker retracted	X <input type="checkbox"/>
OK for interm. feed	X <input type="checkbox"/>	Test weights request	0 <input checked="" type="checkbox"/>
OK for dribble feed	X <input type="checkbox"/>	Reset out of tol. alarm	X <input type="checkbox"/>
Empty bag ready	1 <input type="checkbox"/>	-----	X <input type="checkbox"/>
Clear faults	14 <input type="checkbox"/>	-----	X <input type="checkbox"/>

OFF 

Figure 3-25 Input configuration (Page 2)

« SpeedAC iQ Net weigher V1.2.0 » 11:24 X

WE CARE Client Services

Input configuration 3 / 3

Name	Address Enable	Name	Address Enable
Change WP IN1	X <input type="checkbox"/>	Hold cycle	X <input type="checkbox"/>
Change WP IN2	X <input type="checkbox"/>	-----	X <input type="checkbox"/>
Change WP IN3	X <input type="checkbox"/>	-----	X <input type="checkbox"/>
Change WP IN4	X <input type="checkbox"/>	-----	X <input type="checkbox"/>
Flex input #1	X <input type="checkbox"/>	-----	X <input type="checkbox"/>
Flex input #2	X <input type="checkbox"/>	-----	X <input type="checkbox"/>

OFF 

Figure 3-26 Input configuration (Page 3)

« SpeedAC iQ Net weigher V1.2.0 » 11:25 ☰

WE CARE Client Services

Output configuration 1 / 3

Name	Address Enable	Name	Address Enable
Fault	11 <input checked="" type="checkbox"/>	Discharge door	2 <input checked="" type="checkbox"/>
Catch gate	X <input type="checkbox"/>	Bulk feed	X <input type="checkbox"/>
Vibratory disch. door	X <input type="checkbox"/>	Dribble feed	1 <input checked="" type="checkbox"/>
Intermediate feed	X <input type="checkbox"/>	Hopper fill request	14 <input checked="" type="checkbox"/>
Discharge	X <input type="checkbox"/>	Discharge ready	9 <input checked="" type="checkbox"/>
Stream regulator	X <input type="checkbox"/>	Low level	X <input type="checkbox"/>

OFF (✉)

Icons: Home, Scale, Document, Network, Bell, Left/Right arrows.

Figure 3-27 Output configuration (Page 1)

« SpeedAC iQ Net weigher V1.2.0 » 11:25 ☰

WE CARE Client Services

Output configuration 2 / 3

Name	Address Enable	Name	Address Enable
Out of tolerance	12 <input checked="" type="checkbox"/>	Catch gate dribble	X <input type="checkbox"/>
Overweight alarm	X <input type="checkbox"/>	Bag holder	10 <input checked="" type="checkbox"/>
Underweight alarm	0 <input checked="" type="checkbox"/>	Inflate bag	X <input type="checkbox"/>
Cycle in progress	13 <input checked="" type="checkbox"/>	Bag release	X <input type="checkbox"/>
External bag counter	X <input type="checkbox"/>	Knock hammer	X <input type="checkbox"/>
Cycle in hold	X <input type="checkbox"/>	Activate kicker	3 <input checked="" type="checkbox"/>

OFF (✉)

Icons: Home, Scale, Document, Network, Bell, Left/Right arrows.

Figure 3-28 Output configuration (Page 2)

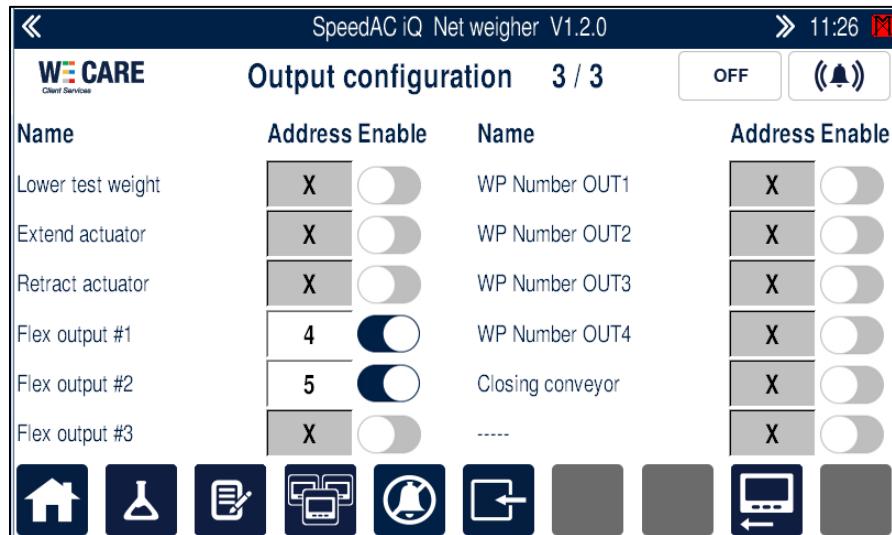


Figure 3-29 Output configuration (Page 3)

3.2.12 I/O test

The **I/O test** screens display the controller inputs statuses and allow to force the outputs.

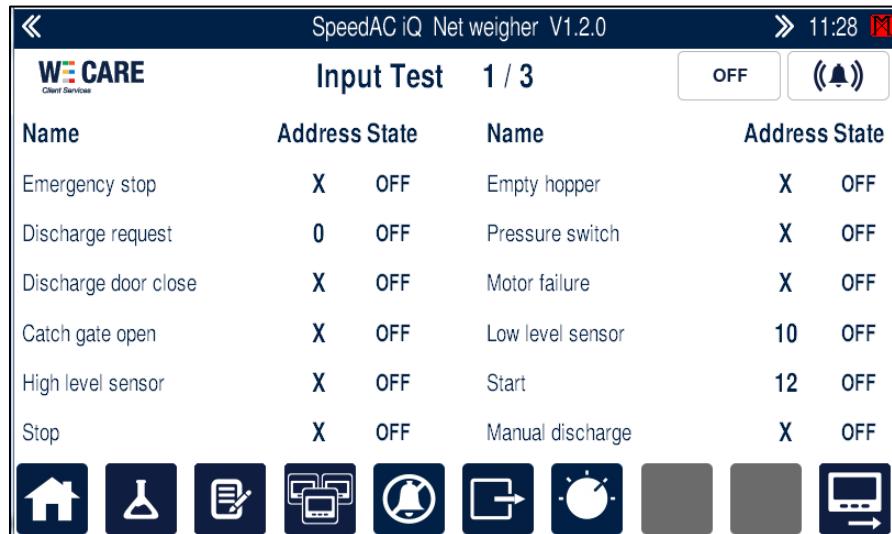


Figure 3-30 Input test (Page 1)

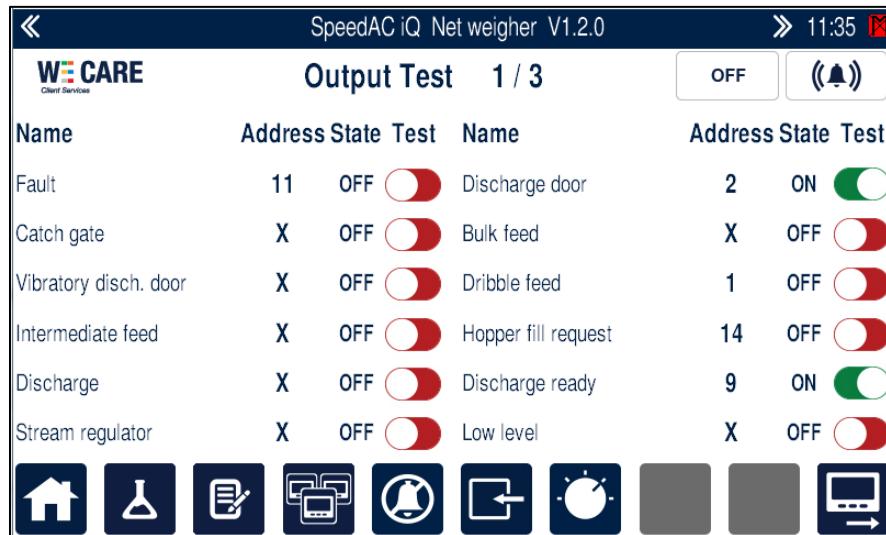


Figure 3-31 Output test (Page 1)

Analog page

To access the **Analog test** screen that displays the controller inputs values and allow to send values to the outputs.

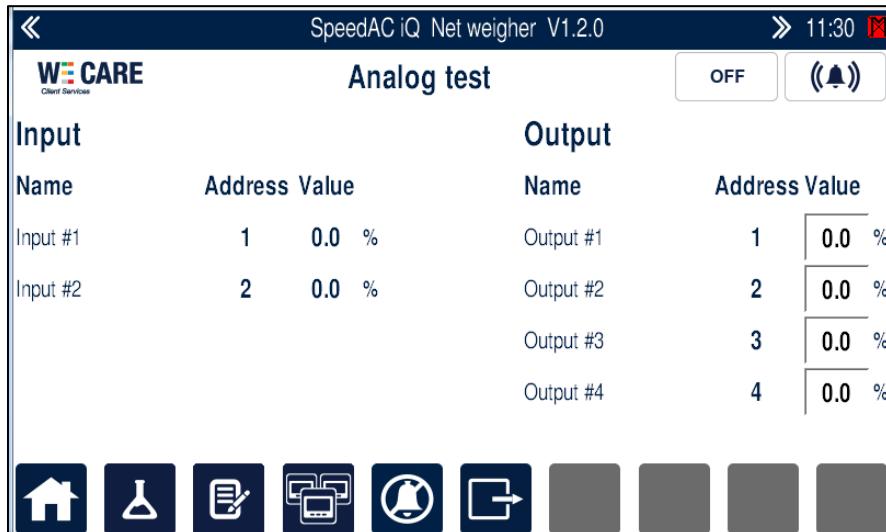


Figure 3-32 Analog test

Name

Input or output name display.

Address

Input or output address display.

State

Input status, and to modify the output status using the selection field.

Test

Turn ON or OFF the corresponding digital output.

Value

Value read from Analog Input or to be sent to Analog output.

3.2.13 Alarms

The **Alarms** screen displays the different alarms generated by the equipment controller.

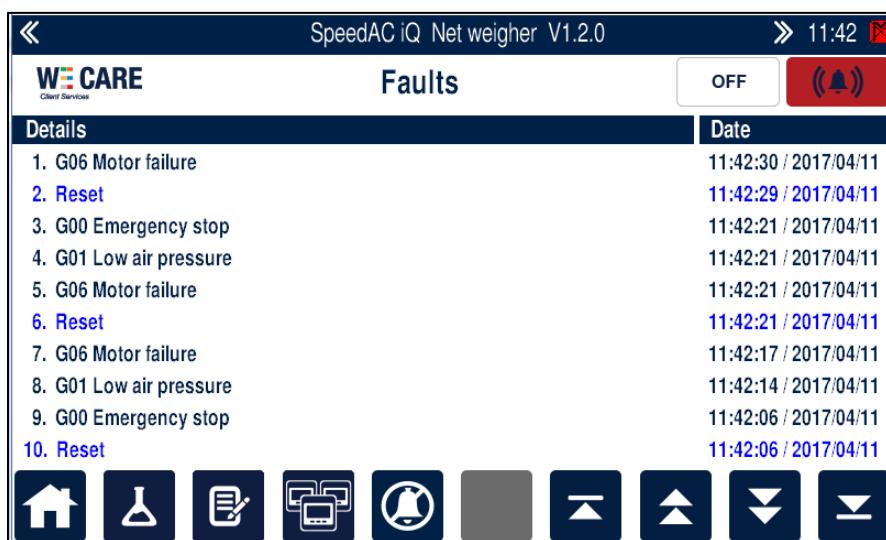


Figure 3-33 Active fault screen

TYPES OF ALARMS

The controller can generate four types of fault:

- ◆ **General faults (G)** bring all modules to an immediate stop, which means the cycle in progress is interrupted. These faults have to be cleared to resume operation.
- ◆ **Stop faults (S)** bring all modules to a stop, but only at the end of the cycle in progress. These faults have to be cleared to resume operation.
- ◆ **Blocking faults (B)** bring the faulted module to a stop. Modules that are not affected continue to operate until their cycle is completed or until an interaction with the faulted module is needed. These faults have to be cleared to resume operation.
- ◆ **Warnings (W)** provide information on operations without stopping the module or equipment. In some cases, the module or equipment is waiting and will automatically restart if the problem is resolved within a certain time. If the problem is not resolved in this delay, the controller will generate a stop or blocking fault.

⚠ WARNING

Take care when the controller generates a warning.
The equipment or module may automatically restart.

To CLEAR AN ALARM

1. When an alarm occurs, the code **GENERAL FAULT**, **BLOCKING FAULT** or **WARNING** appears in the upper right corner, regardless of which screen is displayed.
2. Press the **Alarm display** key (upper right corner of the screen) to display the **Alarms** screen.
3. Read the alarm message displayed. If the message does not help to guide the operator on the action required, refer to the *Alarms Messages* document in the *Troubleshooting* section.
4. Carry out the required solution.
5. Press  to clear the corrected alarms (unresolved alarms will remain displayed).
6. Press **Start** to restart the equipment.

3.2.14 Flexible I/Os

The **Flexible I/Os** screen allows to set up the flexible inputs and outputs. This page is accessible when the Flexible Input and Output are enabled (Input/Output Configuration screens). Flexible outputs are going to cycle only in **Auto** mode.

Flexible Output #1 and #2 can be configured as follow:

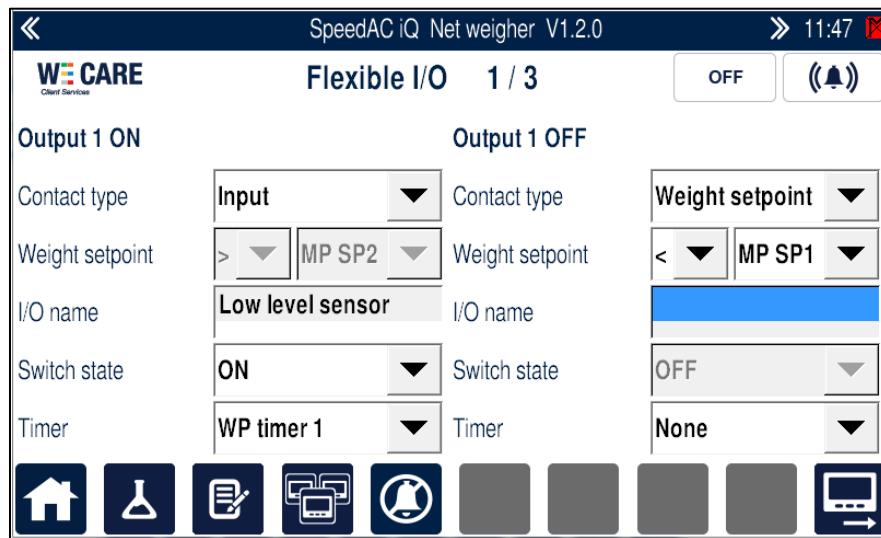


Figure 3-34 Flexible Output #1 Screen

Contact Type

To choose the on and off contact type (**Input /Output/Weight setpoint**).

Weight setpoint

To set the on and off **Weight setpoint** (if **Weight setpoint** is selected as **Contact type**). It can be smaller than/greater than **Weigh program** or **Machine parameter** setpoint 1 or 2 (refer to **Weigh program 4** or **Machine parameter 3** screens).

I/O name

To choose the I/O (among the input/output enabled) that will be used as the flexible I/O.

Switch State

Switch state of the **Contact-(Input /Output)** to turn ON or OFF the flexible Output #1 or #2 related.

Timer

To set the flexible I/O timer. This timer will be triggered when the **Contact** reaches the **Switch state** if it is an **Input** or **Output** or when weigh setpoint condition is reached. It lasts

during the **Flexible T1/T2** setpoint (refer to **Weigh program 4** (Recipe 4) or **Machine parameter 3** screens). If this parameter is set to **None**, no timer will start, the flexible I/O will be activated(deactivated) as soon as the **Contact** reaches the **Switch state**.

Flexible Output #3 can be configured as follow:

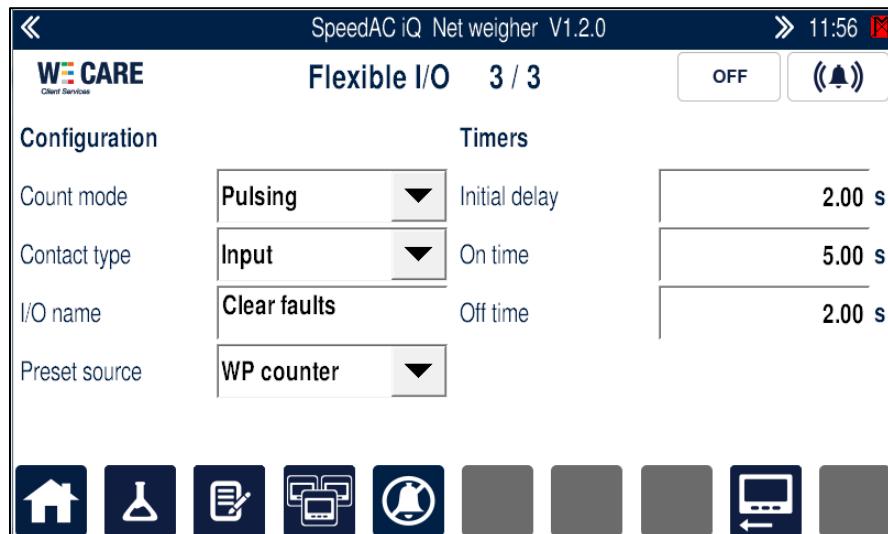


Figure 3-35 Flexible output #3 Screen

Count mode

To choose the between **Pulsing** and **Preset** mode.

Preset After counting the number of events, entered in the selected Preset source, defined by Contact type and I/O name, the Flexible Output #3 will be cycled once, according to the Timers.

Pulsing After one trigger of the event defined by Contact type and I/O name, the Flexible Output #3 will be cycled according to the Timers for a number of times entered in the selected Preset source.

Contact type

To choose the contact type (**Input /Output**).

I/O name

To choose the I/O (among the input/output enabled) that will be used as the flexible I/O.

Preset source

To choose if the counter preset will be from the **Machine parameters** or the **Weigh program** flexible counter.

Initial delay

Amount of time before turning Flexible Output #3 to ON after condition are met.

ON time

Amount of time the Flexible Output #3 will stay ON after Initial delay and after OFF state in Pulsing mode.

OFF time

Amount of time the Flexible Output #3 will stay OFF coming from ON state (only used in Pulsing mode).

3.2.15 Registration

The **Registration** screen displays the **Mac Address** of the controller and allow the Registration Key to be entered. If Registration have never been made or controller flash memory got corrupted, the following screen will appear:

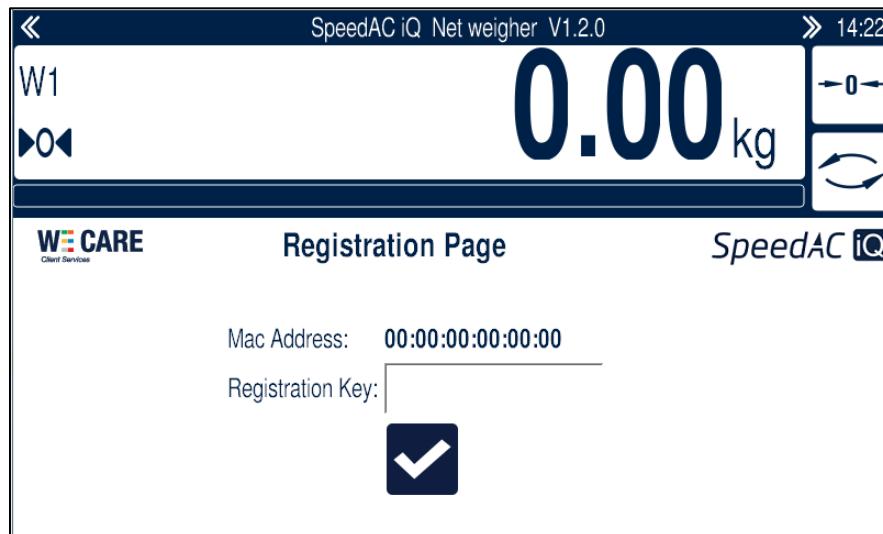
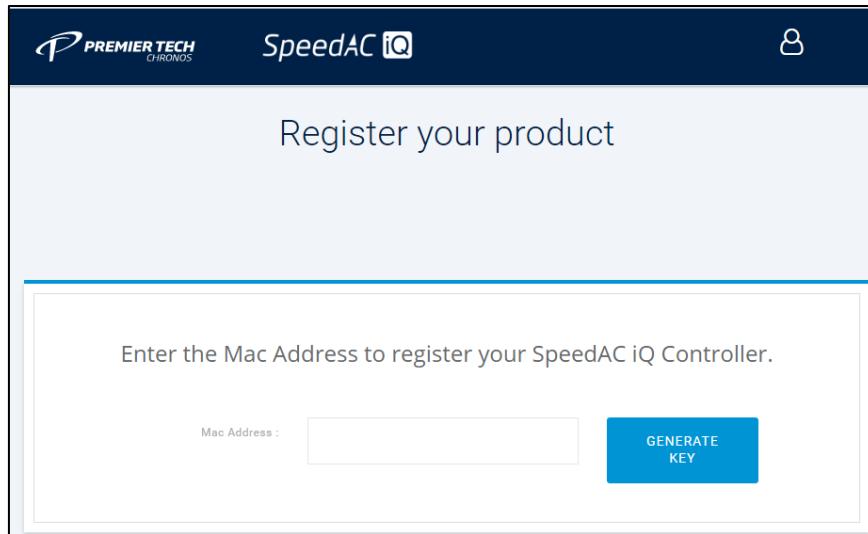


Figure 3-36 Registration screen

Visit the following website to get your Registration Key:

<https://speedaciq.ptchronos.com/#/registration>



Weigh program name: _____

VARIABLE CHART

This section provides empty variable charts to make a record of initial values of the weigh program currently in use.

CAUTION

Before modifying the weigh program, make a written note of initial values of the weigh program currently in use.

Automatic mode		
Target weight	(lb/kg)	
Average	(lb/kg)	
Standard deviation	(lb/kg)	
Last checked	(lb/kg)	
Weighments/min.		
Bulk time	(seconds)	
Dribble time	(seconds)	
Cycle time	(seconds)	

Weigh Programs/Recipe (page 1 of 4)		
Nominal Weight	(lb/kg)	
Overfill	(lb/kg)	
Dribble cutoff	(lb/kg)	
Bulk cutoff	(lb/kg)	
Dribble feed time	(seconds)	
Bulk feed time	(seconds)	
Underweight	(lb/kg)	

Weigh program name: _____

Overweight	(lb/kg)	
Intermediate cutoff	(lb/kg)	
Discharge weight	(lb/kg)	
Discharge time	(seconds)	
Falling time	(seconds)	

Weigh Programs/Recipe (page 2 of 4)

Minimum feeding	(%)	
Maximum feeding	(%)	
Regulator minimum feeding	(%)	
Regulator maximum feeding	(%)	
Stream regulator configuration	(High/Low/Auto)	
Actuator position	(%)	
Weighments/unit	(#)	
Feed delay time	(seconds)	
Vibratory discharge doors	(on/off)	
Zeroing configuration	(Door open/Door closed)	
Slow cycle end	(Dribble Feed/Hold Cycle/End Cycle)	
Enabled Scale	(yes/no)	

Weigh Programs/Recipe (page 3 of 4)

Top-up OFF time	(seconds)	
Top-up ON time	(seconds)	
Knocking time	(seconds)	
Bag inflation time	(seconds)	
Kicker centering time	(seconds)	

Weigh program name: _____

Kicker activation time	(seconds)	
Weight unit	(lb/kg)	
Feed algorithm type	(Standard/Smart iQ/Flash iQ)	
Smart feed adjustment	(Fastest/Faster/Balanced)	
Tune IQ feed	(on/off)	
Standard bulk mode	(By time/By weight)	
Catch gate delay	(seconds)	

Weigh Programs/Recipe (page 4 of 4)

Flexible T1	(seconds)	
Flexible T2	(seconds)	
Flexible counter	(#)	
Flexible SP1	(lb/kg)	
Flexible SP2	(lb/kg)	

Machine Parameters (page 1 of 3)

Sample frequency	
Sample size	
Zero frequency	
Zero limit	(%)
Disable auto zero	(on/off)
Screen saver time	(seconds)
Discharge doors maximum time	(seconds)
Slow cycle time	(seconds)
Catch gate maximum time	(seconds)
Out of tolerance time	(seconds)

Weigh program name: _____

Bag detection time	(seconds)	
Stabilization time limit	(seconds)	

Machine Parameters (page 2 of 3)

Correction on average	(on/off)	
Cutoff correction limit	(%)	
Bulk cutoff correction	(%)	
Cutoff correction	(%)	
Slow filter size		
Fast filter size		
Flash filter size		
Standard filter size		
Smart stabilization window		

Machine Parameters (page 3 of 3)

Flexible T1	(seconds)	
Flexible T2	(seconds)	
Flexible counter	(#)	
Flexible SP1	(lb/kg)	
Flexible SP2	(lb/kg)	

Machine Configuration (page 1 of 3)

Bulk feed blanking time	(seconds)	
Dribble feed blanking time	(seconds)	
Low level debounce time	(seconds)	
Hopper refilling time	(seconds)	

Weigh program name: _____

Number of weigh programs	
OIML application	(yes/no)
Feeder type	
Number of scale	
Configuration bag holder	(S4/RS)
Language 1	
Language 2	
Language 3	

Machine Configuration (page 2 of 3)

Production report port	
Unit record print configuration	
Auto save correction	(yes/no)
Discharge request debouncing	(seconds)
Print port	
Remote controlled	(yes/no)
Discharge on door sensor	(yes/no)
Dribble out in bulk	(on/off)
Plant line name	
Serial number	
Customer name	
Customer location	

Machine Configuration (page 3 of 3)

Operator password	
Supervisor password	

Weigh program name: _____

PT password	
Support phone number	
Support fax number	
Support e-mail	
Operator logout delay	(seconds)
Supervisor logout delay	(seconds)
PT logout delay	(seconds)
Parts phone number	
Parts fax number	
Parts e-mail	

ADJUSTMENTS

4 ADJUSTMENTS

Not applicable.

TROUBLESHOOTING

5 TROUBLESHOOTING

This chapter provides a list of all faults that can be generated by the controller as well as a list of system errors and warnings.

WARNING

Only qualified personnel with a thorough knowledge of the equipment and its *Operating and Maintenance Manual* are authorized to perform troubleshooting procedures.

DANGER

Always perform the lockout procedure before:

- ◆ **making any equipment or part maintenance, repair, modification, replacement, assembly or disassembly**
- ◆ **taking any action involving even the slightest risk.**

DANGER

Only qualified personnel are authorized to open electrical panels.

WARNING

Take care when repairing or working near equipment.

CAUTION

**When the weight controller battery is low, replace it as soon as possible without shutting the electrical power off.
Program loss may occur.**

5.1 Introduction to Fault Descriptions

The document *Fault Descriptions* provides a description of all faults that can be generated by the controller, along with the actions required to correct them. For the sake of conciseness, these descriptions do not include the steps “Clear fault” and “Restart equipment” that are required to resume operation after a fault occurs. For information on these procedures, refer to the *Operation* chapter.

The controller can generate four types of fault:

- ◆ **General faults (G)** bring all modules to an immediate stop, which means the cycle in progress is interrupted. These faults have to be cleared to resume operation.
- ◆ **Stop faults (S)** bring all modules to a stop, but only at the end of the cycle in progress. These faults have to be cleared to resume operation.
- ◆ **Blocking faults (B)** bring the faulted module to a stop. Modules that are not affected continue to operate until their cycle is completed or until an interaction with the faulted module is needed. These faults have to be cleared to resume operation.
- ◆ **Warnings (W)** provide information on operations without stopping the module or equipment. In some cases, the module or equipment is waiting and will automatically restart if the problem is resolved within a certain time. If the problem is not resolved in this delay, the controller will generate a stop or blocking fault.

 WARNING

Take care when the controller generates a warning.
The equipment or module may automatically restart.

5.2 System Errors and Warnings

Major system errors and warnings are related to programming logic and are frequently due to wrong parameter values. The system errors and warnings codes along with their descriptions are presented in this section.

FAULT DESCRIPTIONS

SpeedAC iQ FOR BAGGING SYSTEMS

Name, description and actions necessary

EMERGENCY STOP (G)

An emergency stop button or a pull cord has been activated.

Make the appropriate corrections (if required), reset the emergency-stop button or pull cord, then press the **Emergency-stop reset** button if present.

LOW AIR PRESSURE (G)

The air pressure is too low.

Make sure that the shut-off valve (if present) is open. Make sure that the main pressure regulator indicates a value between 80 and 90 psi (5.5 and 6.2 bar) during operation. Check if the air compressor is operating correctly. Check pressure switch 00PS1, and switches 00PS2 and 00PS3 if present, their tubing, their wiring and the status of the controller inputs. Check that there is no air leak.

CATCH GATE NOT OPEN (G)

The catch gate did not open within the preset **Catch Gate Maximum Time**.

Check if there is mechanical obstruction. Check if there is enough air pressure in the main pressure regulator. Check that there is no air leak. Check the catch gate valve, its tubing, its wiring and the status of its controller output. Make sure there is no product jammed in the catch gate. If the catch gate does open, check the catch gate proximity sensor, its adjustment, its wiring and the status of the controller input.

SYSTEM ERROR (G)

The error message *System error #xxx description* is triggered under different system conditions. Please consult the System error table for more details.

Modify the related parameters and try to restart. If problem persists, contact Premier Tech Chronos technical support.

DISCHARGE DOOR NOT CLOSED (G)

The discharge door did not close within the preset **Discharge Door Maximum Time**.

Check if there is mechanical obstruction. Check if there is enough air pressure in the main pressure regulator. Check that there is no air leak. Check the discharge door valve, its tubing, its wiring and the status of its controller output. Make sure that the door is not closing on product. If the door is doing so, increase the **Discharge Time** value in the **Machine parameters** screen. If the discharge door is closed, check the proximity sensor, its adjustment, its wiring and the status of the controller input.

EXCEEDED CAPACITY (G)

The product weight in the **WEIGH PAN** exceeds the **WEIGHER** capacity because the weigh program parameters are inappropriate or something allows a non-stop flow of product.

Make sure all parameters in the **Receipte** screen are appropriate. Find the cause of the non-stop product flow, and correct the situation.

FAULT DESCRIPTIONS

SpeedAC iQ FOR BAGGING SYSTEMS

Name, description and actions necessary

MOTOR FAILURE (G)

One or many motors is overloaded or the variable frequency drive (VFD) that controls the motor of the FEEDER is malfunctioning.

Check the overload relay of each weigh scale. Find the cause of the overload (electrical malfunction or mechanical obstruction), and correct the situation. Reset the overload relays and check in the **I/O Test** screen if the motor overloads again.

Check the error message for the VFD that controls the motor of the FEEDER and refer to the drive manual to find out the actions required. Find the cause of the fault (electrical malfunction or mechanical obstruction) and correct it.

UNDERWEIGHT (B)

The current weighment is underweighted. This is possibly due to a quick change in the product density, a mechanical defect of the infeed system or a significant change of the rate of feeding.

Accept the fault by pressing the **Discharge Underweight** key and make the necessary corrections.

OVERWEIGHT (B)

The current weighment is overweighed. This is possibly due to a quick change in the product density, a mechanical defect of the infeed system or a significant change of the rate of feeding.

Accept the fault by pressing the **Discharge Overweight** key and make the necessary corrections.

DISCHARGE TOO LONG (B)

The Release Acknowledge did not happen within the preset **Discharge Time**.

Check if there is mechanical obstruction. Make sure that the bag is not pinched between the two conveyors. If the bag is free to go, increase the **Discharge Time** value in the **Recipe** screen, or check the proximity sensor, its adjustment, its wiring and the status of the controller input.

STABILIZATION TOO LONG (S)

The stabilization of the weigh scale is too long, which is usually due to vibration.

Check if something is touching the WEIGH PAN. Check if the structure is abnormally moving. Check if the product is still flowing in the WEIGH PAN after the final cut-off. Check if the DISCHARGE DOOR is leaking.

ZERO OUT OF RANGE (S)

The controller can not indicate zero even if the **Zero** function key (on the user interface) has been pressed, because the value is too high to be accepted as a zero.

Check if there is product accumulation inside and around the WEIGH PAN. Check if something comes into contact with the weigh scale. Make sure the WEIGH PAN is clean and try to zero again. If it is not working, display the **I/O Test** screen and make sure that the input from the load cell is between 1 mV and 4 mV. Try to zero again using the controller calibration procedure described in the *Systec Calibration manual*.

BAG NOT DETECTED (S)

The bag has not been detected even if a filling request has been made.

Check if there is mechanical obstruction. Check if there is enough air pressure in the main pressure regulator. Check the working order of the pneumatic tubing and electrical wiring. Check the bag detection sensor, its adjustment, its wiring and the status of the controller input.

FAULT DESCRIPTIONS

SpeedAC iQ FOR BAGGING SYSTEMS

Name, description and actions necessary

INFEED HOPPER ILLOGICAL DETECTION (S)

The high level detector is obstructed while the low level one is not, which is illogical. Product can not obstruct the high level detector without obstructing the low level one.

If product is present in front of both detectors, check the low level detector, its adjustment, its wiring and the status of the controller input. If there is no product in front of the high level detector, check it, its adjustment, its wiring and the status of the controller input.

INFEED HOPPER LOW LEVEL (S)

The hopper low level sensor has been cleared indicating that the product level is low into the hopper.

Make sure the product feeding system is running. Check if the low level sensor is obstructed. If so, check the low level sensor, its adjustment, its wiring and the status of the controller input. If there is no product into the hopper, check the product feeding system.

SLOW CYCLE (W)

The WEIGH PAN has not been filled within the preset **Slow Cycle Time**.

If the **Empty Hopper** key has been pressed, and if there are two weigh scales, wait until the second scale empties, then press the **Stop** key in order to discharge the remaining product. If the **Empty Hopper** key has not been pressed, check if the low level sensor is working properly and if something is blocking the product flow. Check the load cell (refer to Chapter *Maintenance*). Check the dosing system.

SYSTEM WARNING 1XX (W)

The CONTROLLER has not been able to zero(0) the scale.

Refer to System warning table for more details. If problem persist, contact your Premier Tech Chronos technical support.

FAULT DESCRIPTIONS

SpeedAC iQ FOR BAGGING SYSTEMS

System error code	Description
120	IQ FLASH VARIABLES NOT INITIALIZED
121	IQ FLASH WEIGHMENT ABORTED
122	IQ FLASH EMERGENCY WEIGHT DETECTED
123	IQ FLASH START TIMEOUT
124	IQ FLASH COULD NOT BE SELECTED
128	IQ FLASH COULD NOT GET CONTROL PARAMETERS
130	IQ SMART VARIABLES NOT INITIALIZED
131	IQ SMART WEIGHMENT ABORTED
132	IQ SMART EMERGENCY WEIGHT DETECTED
133	IQ SMART START TIMEOUT
134	IQ SMART COULD NOT BE SELECTED
138	IQ SMART COULD NOT GET CONTROL PARAMETERS
140	IQFEEDING CONNECTION NOT ESTABLISHED
201	FILLING TASK STOPPED
202	LOGIC OPERATION TASK STOPPED
203	TWO OUTPUTS CONFIGURED WITH SAME ADDRESS
301	WP NOT CONFIGURED OR DATABASE NOT LOADED
302	IOS NOT CONFIGURED OR DATABASE NOT LOADED
303	MC NOT CONFIGURED OR DATABASE NOT LOADED
304	MP NOT CONFIGURED OR DATABASE NOT LOADED
305	OUTPUT "BULK FEED" NOT CONFIGURED
306	OUTPUT "DRIBBLE FEED" NOT CONFIGURED
307	DIGITAL IO ERROR - GROUP #
311	DATABASE: WP ACCESS REQUEST TIMEOUT
312	DATABASE: MP ACCESS REQUEST TIMEOUT
313	DATABASE: MC ACCESS REQUEST TIMEOUT

FAULT DESCRIPTIONS

SpeedAC iQ FOR BAGGING SYSTEMS

System error code	Description
314	DATABASE: FLEXIO ACCESS REQUEST TIMEOUT
321	CONTINUOUS OUTPUT: NOT SET IN SERVICE MODE
322	CONTINUOUS OUTPUT:SM VS MC PORT MISMATCH
323	CONTINUOUS OUTPUT:MC PORT CONFLICT
324	FIELDBUS MISMATCH: CONFIGURATION VS INSTALLED MODULE
411	SCALE #1 ONLY IQFEEDING DRIVER PERMITTED
412	SCALE #2 ONLY LBS DRIVER PERMITTED
413	SCALE #3 ONLY IQFEEDING DRIVER PERMITTED
414	SCALE #4 ONLY LBS DRIVER PERMITTED
421	SCALE #1 IQSIM DRIVER NOT INSTALLED
423	SCALE #3 IQSIM DRIVER NOT INSTALLED
431	SCALE #1: WRONG SCALE DRIVER
432	SCALE #2: WRONG SCALE DRIVER
433	SCALE #3: WRONG SCALE DRIVER
434	SCALE #4: WRONG SCALE DRIVER
441	IQSIM ALGORITHM NOT ALLOWED IN SIMULATOR

FAULT DESCRIPTIONS

SpeedAC iQ FOR BAGGING SYSTEMS

System warning code Description

0	NO ERROR, ACTION SUCCESSFULLY
11	NO RESPONSE FROM SCALE
12	SCALE OVERLOADED
13	SCALE NOT SETTLED
14	SCALE NOT AVAILABLE
15	TARING ERROR
20	SCALE UNDERLOADED
21	SCALE NOT LEVELED, SIGNAL FROM INCLINE SWITCH
22	SCALE NOT IN ZERO-SETTING RANGE AFTER POWER-UP
23	SCALE IN MOTION AFTER POWER-UP
24	SCALE NOT CALIBRATED, CALIBRATION DATA CHECKSUM ERROR
40	WEIGHING MODULE NOT INSTALLED
41	INTERNAL COMMUNICATION ERROR
42	SCALE NOT PRE-CALIBRATION (FACTORY CALIBRATION)
65	TIMEOUT
66	TERMINAL IN SERVICE MODE
501	DESTINATION NAME: CANNOT OPEN FILE
503	DESTINATION NAME FULL
504	DESTINATION NAME: CANNOT OPEN DIR.
510	PORT NAME CONNECTION LOST
511	PORT NAME PRINTER CONNECTION LOST
512	UNIT RECORD FIFO STACK FULL

MAINTENANCE

6 MAINTENANCE

This chapter describes maintenance procedures for the SpeedAC iQ weight controller. Since the following information has a direct impact on the safety of workers, take the time to read it carefully.

WARNING

Only qualified personnel with a thorough knowledge of the equipment and its *Operating and Maintenance Manual* are authorized to perform maintenance procedures.

DANGER

Always perform the lockout procedure before:

- ◆ **making any equipment or part maintenance, repair, modification, replacement, assembly or disassembly**
- ◆ **taking any action involving even the slightest risk.**

CAUTION

**To avoid program loss, the controller backup battery should be replaced every three (3) years.
Turn the main power off when replacing the battery.**

To replace the battery proceed as follows:

1. Disconnect all power to the instrument, unplug line cord.
2. Open the housing and refer to picture above to locate the mainboard.
3. Use small screw driver or other suitable tool and carefully remove bracket from battery holder.
4. 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!

5. Put bracket of battery holder back in place.
6. Close housing and power the instrument up. Display of weighing terminal shows power up message. The unit is operational again.

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

ELECTRICAL **SYSTEM**

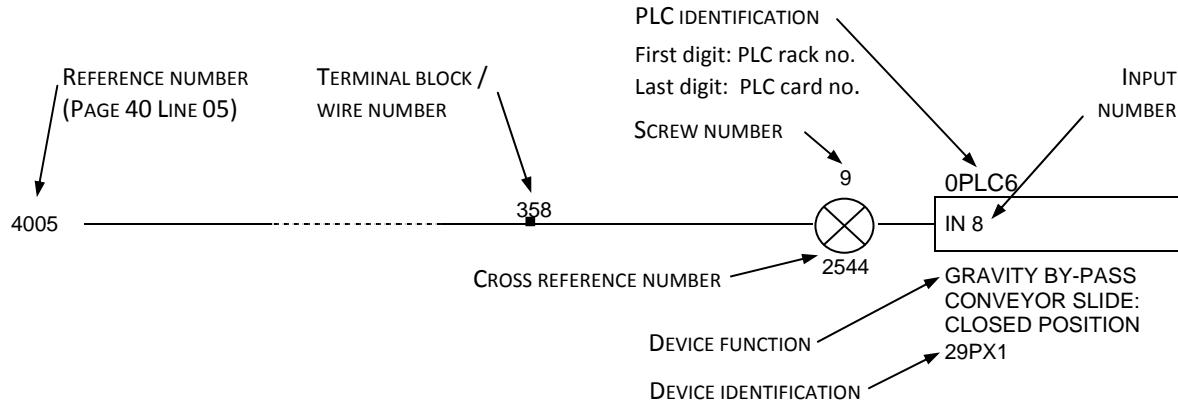
ELECTRICAL DEVICES CHECK

When an alarm occurs, electrical devices to be checked (sensors, valves, etc.) are identified in the *Alarm Messages* list provided in the *Troubleshooting* section. The following procedure explains how to check if the electrical devices are working properly.

1. On the electrical parts list, identify the device and its electrical drawings reference number.

Note: The device mentioned above is used as an example and does not necessarily apply to your equipment.

2. Find out the reference number on the electrical drawings (see the diagram below). This number is always located at the extreme left of the page.
 3. Identify the PLC card number, input or output number and status light, as well as the terminal block/wire number. Note that the following example is for an input. For outputs, the diagram is mirror-imaged.



4. Manually activate the device and check if the corresponding status light turns on (or turns off according to the type of device). If not, the device itself or the wiring between the device and the PLC card might be defective.
 5. Make the necessary corrections.

ELECTRICAL DRAWINGS AND PARTS LIST

Documentation pertaining to the electrical system includes electrical drawings, parts list, cable list and network drawing (when required). These documents will be provided as soon as a version *As Manufactured* or *As Built* is available.

PARTS ORDERING

PARTS ORDERING

Returning Parts

Before returning a part to our offices, you must obtain prior written authorization from Premier Tech. A copy of this authorization must be sent with the part returned.

CAUTION

**Any part received by Premier Tech without prior
written authorization will be automatically returned
to the sender at his expense.**

Ordering Parts

Premier Tech offers you various ways to order parts for your equipment:

- **Online** at www.ptchronos.com/eparts
- **By e-mail** at parts@ptchronos.com
- **By phone** at (418) 867-8884

Before ordering parts, make sure to have your part numbers handy. To find these numbers, please refer to the different part lists provided by Premier Tech.

APPENDICES

APPENDICES

This chapter provides additional information regarding the SpeedAC iQ weighing controller. The SpeedAC iQ Printing/Reporting and Fieldbus Communication are presented in this section.

WARNING

Only qualified personnel with a thorough knowledge of the equipment and its *Operating and Maintenance Manual* are authorized to operate the equipment.

DANGER

Always perform the lockout procedure before:

- ◆ **making any equipment or part maintenance, repair, modification, replacement, assembly or disassembly**
- ◆ **taking any action involving even the slightest risk.**

1. Printing/Reporting Abilities vs Port Selection

The SpeedAC iQ Controller allows the operator to perform various data printing/reporting based on port selection (Com 2, USB or Ethernet) in the **Machine Configuration** page 2.

The following options are available for printing/reporting data depending on the operator choice:

- Continuous Output (configuration required in Controller **Service Mode** as per Systec User Manual). The operator must select the format and either the Ethernet Port (Eth) or SIM2 (Com2) to carry out data. No other printing option is selectable once configured on the port.
- Unit Record String (for data trending in PC or PLC).
- Unit Record Files which is an extension of Unit Record String in a file.
- Report to Printer (for screen content hard copy).

The Table 1 summarized all these options for a best understanding to make a wise choice.

	Ethernet		USB		Com 2	
Continuous Output	✓	Must be configured in Service Mode	✗	N/A	✓	Must be configured in Service Mode
Unit Record String	✓	Always available	✓	For Data Trending in PC or PLC	✓	For Data Trending in PC or PLC
Unit Record File	✗	N/A	✓	Stored 3 days (SHARED)	✗	N/A
Report to Printer	✓	Screen content hard copy	✓	Screen content hard copy	✓	Screen content hard copy
	✓	Available	✗	Not Applicable (N/A)		

Table 1: Available Printing/Reporting Options vs Port Selection

Figure 1 to Figure 3 are depicting the content of the drop-down lists for each type of selected ports. Content will be discussed later in this document.

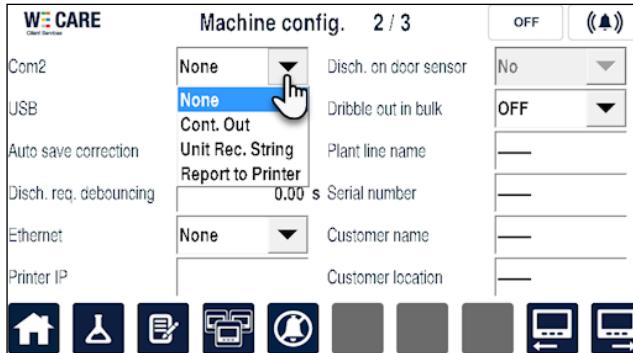


Figure 1: Com 2 Drop-Down List Printing/Reporting Options

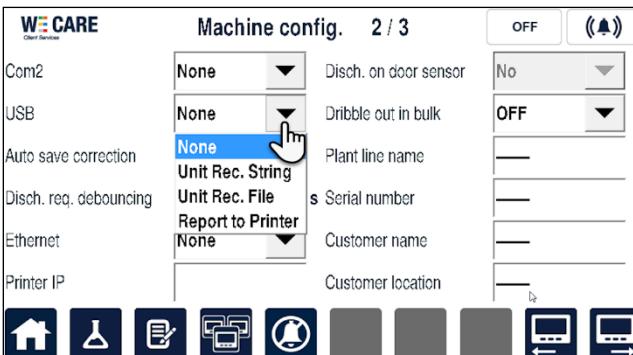


Figure 2: USB Drop-Down List Printing/Reporting Options



Figure 3: Ethernet Drop-Down List Printing/Reporting Options

2. Continuous Output

The Continuous Output (live weight) must be configured in the Controller **Service Mode** either on the Ethernet (Eth) IP or Com 2 (SIM2) ports. The selected port will be used only to carry on data and no other printing/reporting options can be selected after the configuration is completed.

The configuration includes the choice of the type of format to which data will be formatted.

Note: Com2 is assigned to SIM2

Please refer to *Systec IT8000ET User Manual* and read the following sections for further details:

- Entry of Parameters (General) – Tree view navigation on Service Mode
- **Continuous Output (Cont. out) – Interface Protocols Setup**
- **Connection of Serial Interfaces (SIM And DUAL-ISM) – Wiring of Serial Interfaces**

3. Unit Record String

3.1. Available ports

As described previously, the Unit Record String is used to perform data trending via a PC or PLC. This option is available via USB, Com 2 and Ethernet Ports. For Ethernet access, data is always available, without any iQ configuration, at SpeedAC iQ IP address - port 2500.

3.2. String definition

Weighing Data are specifically formatted in a string of 13 different fields separated with a semicolon (;) with tags character CR and LF to its end for Carriage Return and Line Feed respectively.

1	2	3	4	5	6	7	8	9	10	11	12	13
< ; 000 000 001 ; 40.00 ; kg ; 40.00 ; >o< ; 39.90 ; = ; 40.10 ; 137033 ; 1/1 ; 161631 ; > CR LF												

- Field 1: Start character ‘<’
- Field 2: Serial Number of up to 12 alphanumeric digits set in Machine Configuration
- Field 3: Target Weight Value of up to 4.2 digits (xxxx.yy)
- Field 4: Unit of Weightment ‘kg’ or ‘lb’
- Field 5: Sampled Weight or Target Weight Value depending of field 6

- Field 6: Sampled Weighment Status
 - '>o' Weighment sampled (Sampled Weight is sent in field 5)
 - '---' Weighment not sampled (Target Weight is sent in field 5)
- Field 7: Underweight Setpoint in Weigh Program
- Field 8: Sampled Weighment Result
 - '=' Sampled Weight is smaller than Underweight Value (Field 7)
 - '=' Sampled Weight is equal or larger to Underweight Value (Field 7)
 - AND is equal or smaller than Overweight Value (Field 9)
 - (Also issued if weighment is not sampled – see Field 6)
 - '+' Sampled Weight is larger than Overweight Value (Field 9)
- Field 9: Overweight Setpoint in Weigh Program
- Field 10: Units Done as per Production Report page, can be reset in this page (up to 6 digits)
- Field 11: Weighments Done/Weighment per Unit (set in Weigh Program)
- Field 12: Time of Weighment (6 digits) HHMMSS
- Field 13: End Character '>'
- Carriage return end line feed characters are sent at the end of the string
- **Figure 4 and Figure 5** show the way to select Unit Record String Data option from the drop-down list on Com 2 and USB fields respectively.

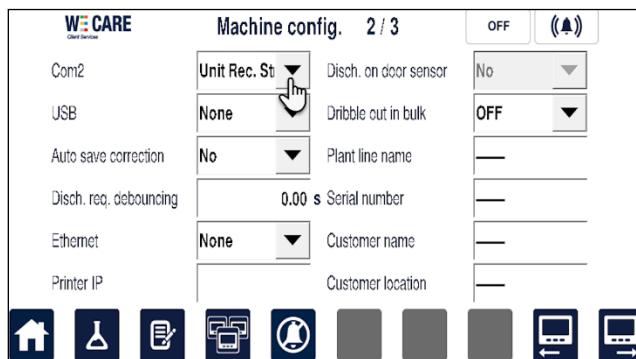


Figure 4: Unit Record String on Com2 Port

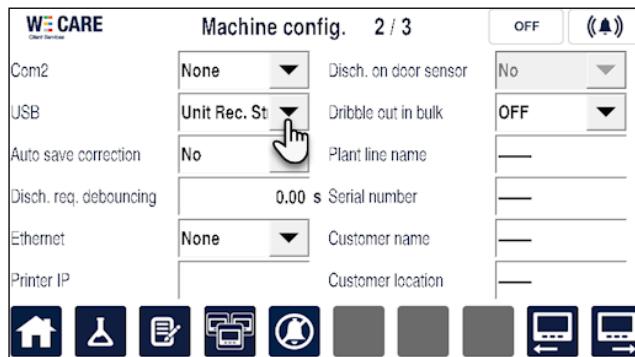


Figure 5: Unit Record String on USB Port

4. Unit Record File

The SpeedAC iQ Controller can store weighing data (Unit Record String), in a file, in the controller **Shared** folder memory (for 3 days) and in **USB Shared** folder (for 7 days maximum). Storage in controller shared memory is made without any iQ configuration (not optional).

First, the Unit Record File that may be available on USB memory device must be selected from the drop-down list as shown in **Figure 6**.

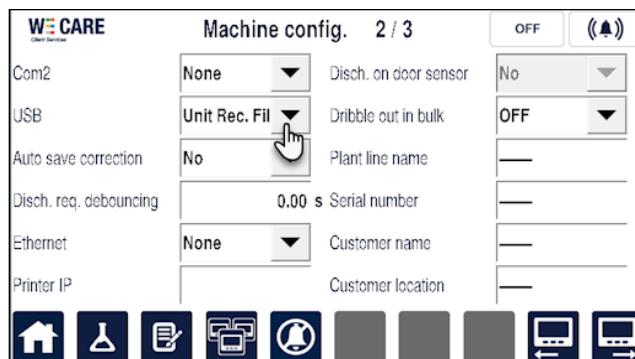


Figure 6: Unit Record File on USB

4.1. Weighing Data Location

- A FAT32 USB Memory device must be plugged in to the SpeedAC iQ USB port to collect data.
- USB device must have a *folder* named “**DataLog**” created at the root of the device for weighing data to be stored.
- A 7 files log will be kept in this folder, each day using one file. If there are more than 7 files, the oldest will be deleted for space purpose.

- File name will be created as follow: **Unit_Record_YYMMDD.txt**
 - YY last 2 digits of year set in SpeedAC iQ.
 - MM current month set in SpeedAC iQ.
 - DD current day set in SpeedAC iQ.

A 22.32 kg overweight dump was recorded at 13.57.09 (PM) in file Unit_Record_170926.txt and illustrated in **Figure 7**.

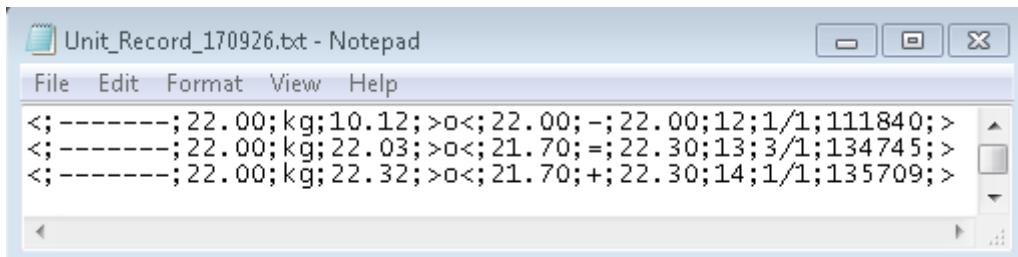


Figure 7: Sample of Unit Record String Data File

Once this selection of Unit Record File option is done, the weighing data are then accessible per 2 different ways:

4.2. Accessing Weighing Data via USB Stick

The operator must stop the weighing equipment to avoid losing data.

- Stop cycle
- Remove USB device from SpeedAC iQ
- Plug it into a computer and copy the file(s)
- Put USB device back in controller and Restart system

Figure 8 shows the **Unit_Record_YYMMDD.txt** file in the USB stick in the DataLog folder (that was described previously).

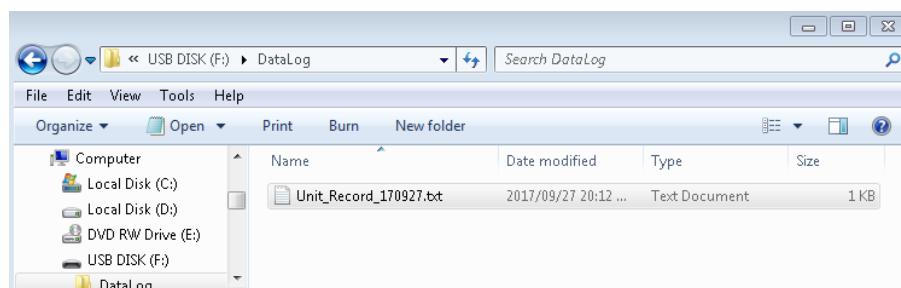
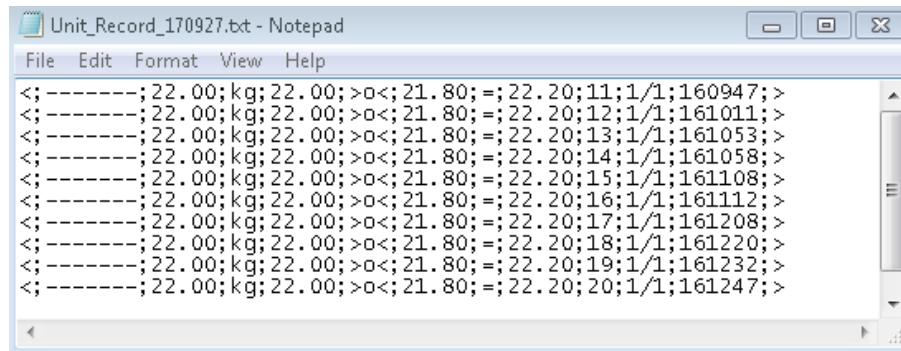


Figure 8: USB Unit_Record_YYMMDD.txt File Location on DataLog Folder

Figure 9 shows the content of the **Unit_Record_YYMMDD.txt** with a record of 10 dumps performed.



```
<-----;22.00;kg;22.00;>o<;21.80;=;22.20;11;1/1;160947;>
<-----;22.00;kg;22.00;>o<;21.80;=;22.20;12;1/1;161011;>
<-----;22.00;kg;22.00;>o<;21.80;=;22.20;13;1/1;161053;>
<-----;22.00;kg;22.00;>o<;21.80;=;22.20;14;1/1;161058;>
<-----;22.00;kg;22.00;>o<;21.80;=;22.20;15;1/1;161108;>
<-----;22.00;kg;22.00;>o<;21.80;=;22.20;16;1/1;161112;>
<-----;22.00;kg;22.00;>o<;21.80;=;22.20;17;1/1;161208;>
<-----;22.00;kg;22.00;>o<;21.80;=;22.20;18;1/1;161220;>
<-----;22.00;kg;22.00;>o<;21.80;=;22.20;19;1/1;161232;>
<-----;22.00;kg;22.00;>o<;21.80;=;22.20;20;1/1;161247;>
```

Figure 9: Reading of Unit_Record_YYMMDD.txt File from USB Stick

4.3. Accessing Weighing Data via FTP

Note: This procedure does not require the stopping of equipment.

- Locate controller Ethernet TCP/IP address (xxx.xxx.xxx.xxx)
- Use any FTP client tool or any web browser (<ftp://xxx.xxx.xxx.xxx>)

4.3.1. Accessing SHARED Folder

To access the **Shared** folder on the SpeedAC iQ Controller via FTP Tool or from any web browser you must login with the following credentials:

Username: **shared**

Password: **2234** (Set in Service Mode - 'Network' menu)

Please refer to **Figure 10** to **Figure 12** for more details of data collected and its content as well.

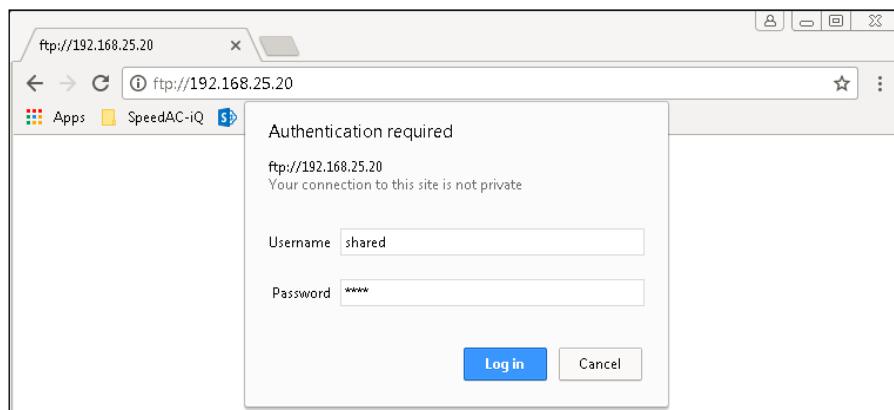


Figure 10: FTP Authentication on SpeedAC iQ Controller on Shared Folder

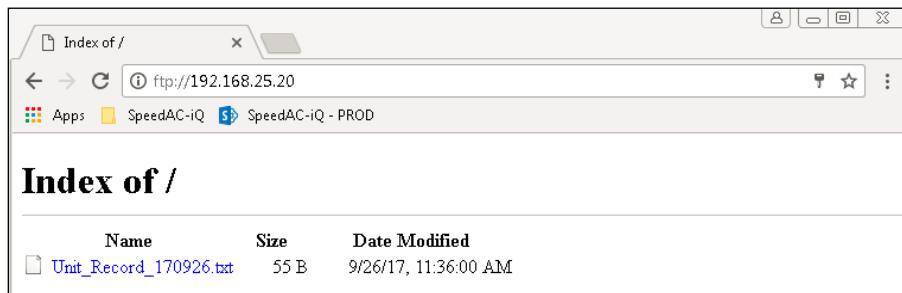


Figure 11: Unit Record File Access on Shared Folder



Figure 12: Unit Record File Content on Shared Folder

4.3.2. Accessing USBSHARED Folder

In the same manner, USB Shared Folder is accessible using the following credentials:

Username: **usbshared**

Password: **2234** (set in Service Mode - 'Network' menu)

Please refer to **Figure 13** to **Figure 15** for more details on the content resulting from exploring the content of the DataLog folder from the FTP remote access.

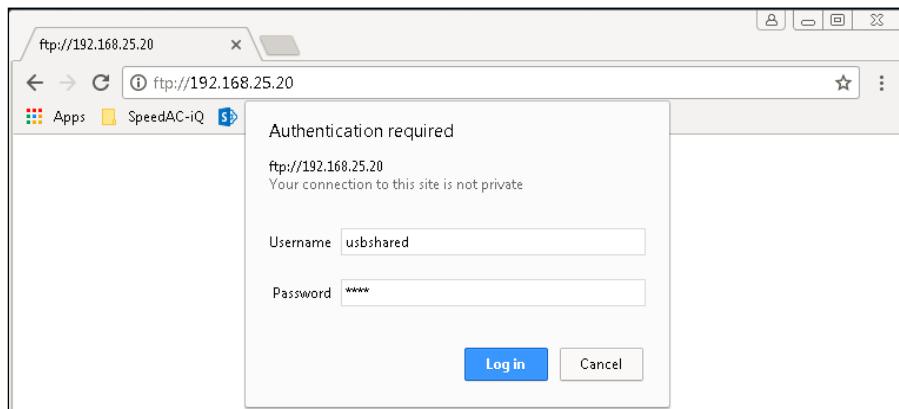


Figure 13: FTP Authentication on SpeedAC iQ Controller on USB Shared Folder

Figure 14 displays the **Unit_Record_YYMMDD.txt** file stored in the **DataLog** folder. Usually, the size of this file is bigger than the one in the Unit Record String option due to the number of weighments performed.



Figure 14: FTP Unit_Record_YYMMDD.txt File Location on DataLog Folder

In our example in **Figure 15**, the content of the text file indicates 10 weighments for Sep. 27th 2017.

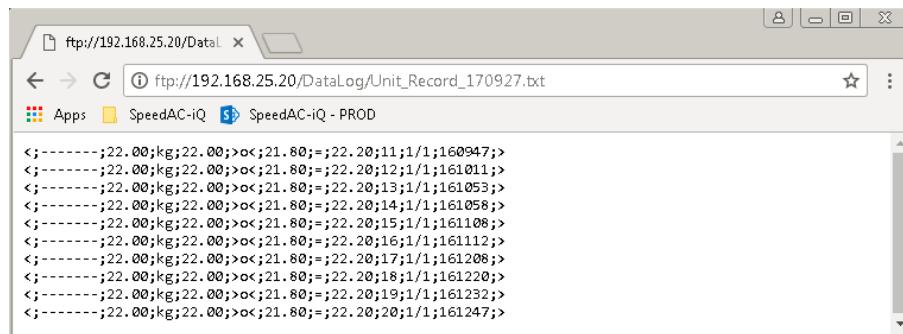


Figure 15: Reading of Unit_Record_YYMMDD.txt File from FTP Access

5. Report to Printer

Independently from hard prints (on real printer), reports will be printed to USB files or sent as regular ASCII over Ethernet port without any special configuration.

USB: if a USB key is plugged into the port, a report will be generated, at the root of the key. It will either be "PrintReport.txt" for the standard report and "PrintBatch.txt" for the batch report. Any time the print function will be triggered, the new report will be written at the end of the file, allowing the file to keep the history of the reports. The files can be accessed via FTP or manually.

Ethernet: Every time the print function is triggered, the associated report page will be sent as a regular ASCII string over Ethernet on port number 9101. The report can be collected via a PC application that will listen to the controller IP address, at the port number mention above.

The **Report to Printer** option is available for all selected ports to print out report screens content on hard copy. We are going to describe how to select these ports and eventually additional features required to make it work.

5.1. Over Ethernet IP Port

Over the Ethernet IP Port, the operator should ensure that the IT Department already provided an IP address to the Network Printer in the same range as for the SpeedAC iQ controller. The SpeedAC iQ Controller IP address is 192.168.25.20 in our example.

Now, switch to the controller Machine Configuration page 2 of 3 and select **Report to Printer** from the drop-down list in the **Ethernet** field as it is described on **Figure 16** below (go to section 5.4 and 5.5 to access the Report Page details).

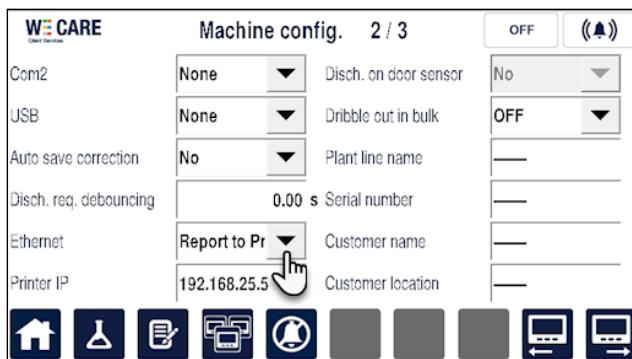


Figure 16: Report to Printer Selection over Ethernet IP

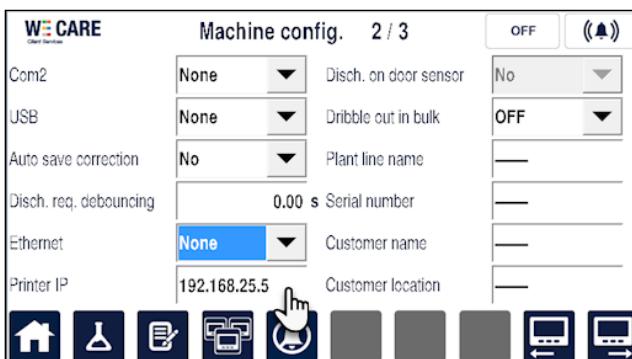


Figure 17: Printer IP Setup

Then, enter the IP Address in the **Printer IP** field (e.g.: 192.168.25.5) as described in **Figure 17**.

5.2. Over USB Port

Please select **Report to Print** from the drop-down list on the **USB** field as shown in **Figure 18** (go to section 5.4 and 5.5 to access the Report Page details).

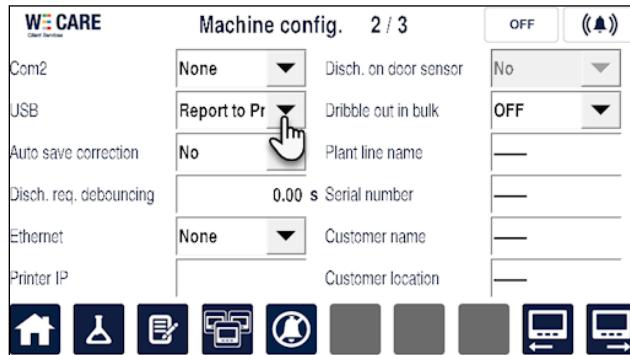


Figure 18: Report to Printer Selection over USB

5.3. Over Com2 Port

Please select **Report to Print** from the drop-down list on the **Com2** field as shown in **Figure 19** (go to section 5.4 and 5.5 to access the Report Page details).

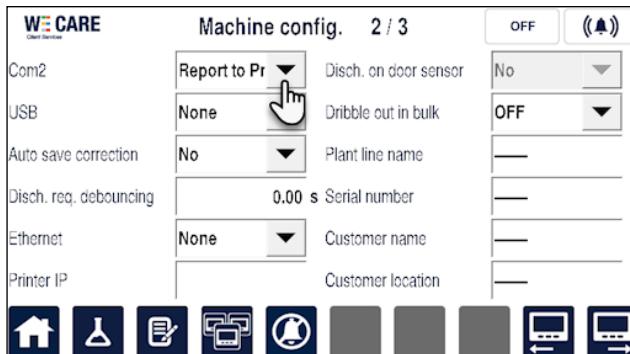


Figure 19: Report to Printer Selection over Com2

5.4. Accessing Production Report Page Printing

This part applies to any type of port selected in section 5.1 to 5.3.

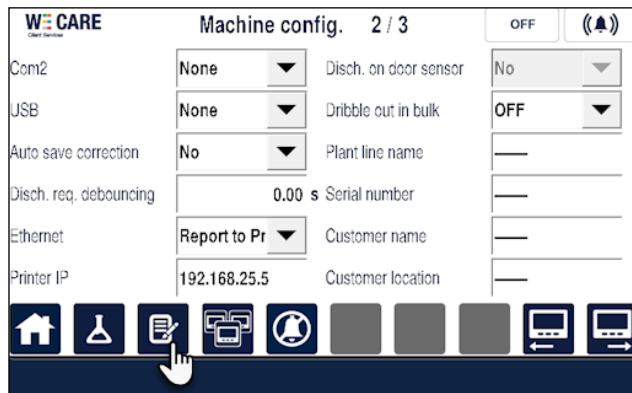


Figure 20: Report Page Access

Click on the **Report** button as described **Figure 20** above to access the Production Report page.

Then, click on the **Printer** button to print your **Production Report** as shown in **Figure 21**.

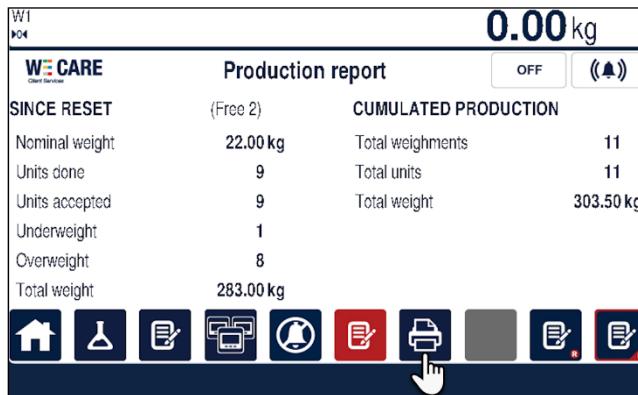


Figure 21: Production Report Raw Screen

The result should look like the one in Table 2 on the paper sheet.

Production report	WP:Free 2	2017/09/27
		15:31:26
SINCE RESET		CUMULATED PRODUCTION
Nominal weight	22.00	kg Total weighments 11
Units done	9	Total units 11
Units accepted	9	Total weight 303.50 kg
Underweight	1	
Overweight	8	
Total weight	283.00	kg

Table 2: Production Report Screen Hard Copy

5.5. Accessing Batch Report Page Printing

Click on the **Red Report** button to switch to the **Batch Report** page (refer to **Figure 22**).

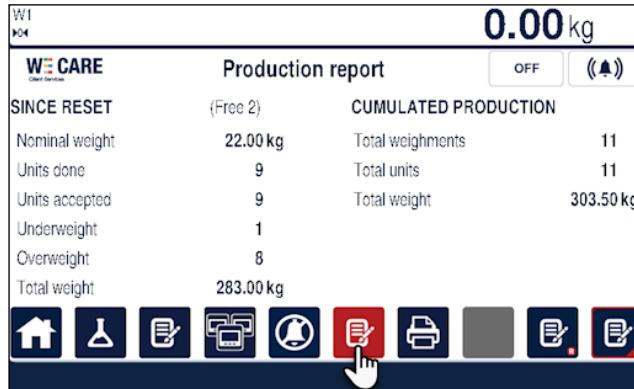


Figure 22: Batch Report Page Access

Then, click on the **Printer** button on **Figure 23** to print your **Batch Report** sample.



Figure 23: Batch Report Raw Screen

The result of the printing trial should look like the one described on Table 3 below on the sheet paper.

Batch report	WP: Free 2	2017/09/27		
Batch name	MY BATCH NAME	15:43:43		
Preset	0	Total weight	0.00	kg
Units done	0	Minimum accepted	0.00	kg
Units accepted	0	Maximum accepted	0.00	kg
Underweight	0	Residue weight	0.00	kg
Overweight	0	Std. deviation	0.0000	kg
Count all	ON	Average	0.00	kg
Details	MY BATCH DETAILS			

Table 3: Batch Report Screen Hard Copy

1. Fieldbus Communication with PLC

1.1. Overview

The SpeedAC iQ Controller allows communication with PLC thru 4 fieldbus protocols:

- Profibus DP (Internal Profibus module PBU/PBX)*
- Modbus TCP (via built-in Ethernet port)
- PROFINET (Internal PROFINET module PNU/PNX)*
- ETHERNET-IP (Internal ETHERNET-IP module ETX)*

Please refer to IT8000ET Systec User manual for further details on the fieldbus plug-in module.

2. Ethernet/IP configuration

Prerequisites are necessary to configure the SpeedAC iQ controller communication with the PLC (**CompactLogix L33ERM from Rockwell Automation in our example**).

Set the IP Address of your PC in the same range as for your PLC one:

- PLC : 172.19.48.73 (for instance)
- PC : 172.19.48.50 (for instance)

2.1. Connection and Setup of Ethernet/IP-Module ETX

This section describes how to configure the ETX Module to fully communicate with the PLC. We will need to access the **Service Mode** on the SpeedAC iQ controller to change the Fieldbus Communication Settings as well. Please follow the steps below.

- Make sure that you have connected the right Ethernet/IP-Module ETX card on the SpeedAC iQ mainboard as per **Figure 1**.

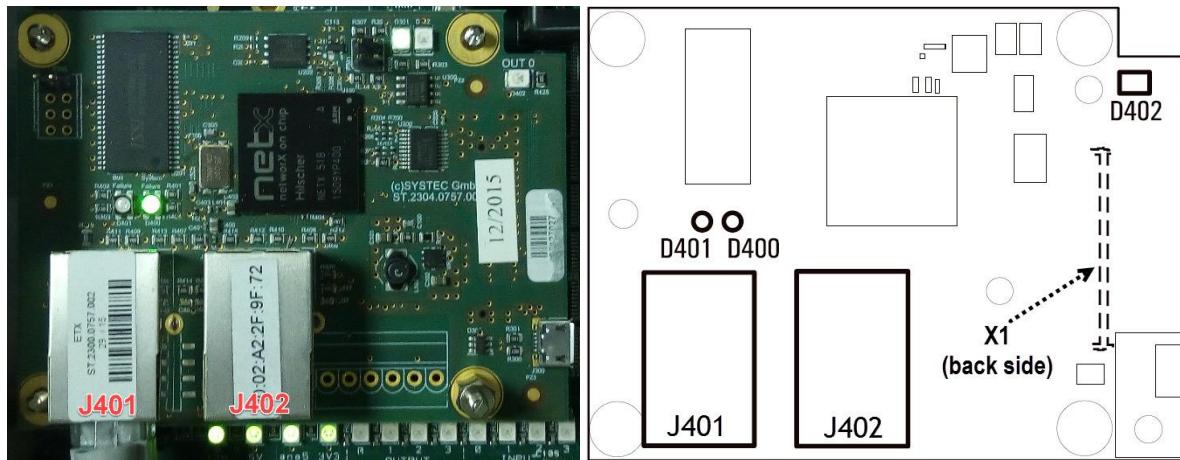


Figure 1: ETX Sockets for Ethernet/IP Communication

- Connect a RJ45 cable on J401 socket (J401 and J402 are equivalents) to your PLC and another RJ45 from your PC to the Ethernet communication switch of the PLC.
- Use the **Admin** Password to switch to the **Service mode** screen on the SpeedAC iQ Controller (**Figure 2**).

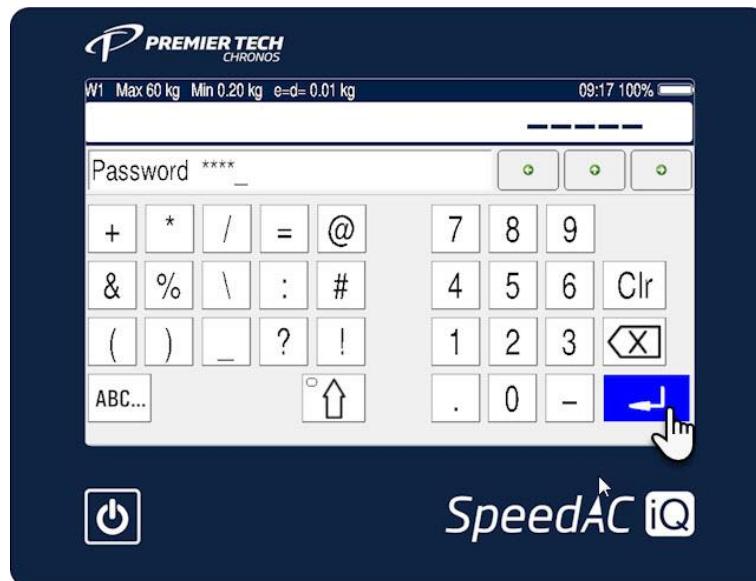


Figure 2: SpeedAC iQ Admin Password Validation Screen

- Use the right-hand side arrow key to locate **Service Config** and validate by hitting the blue return button (**Figure 3**).

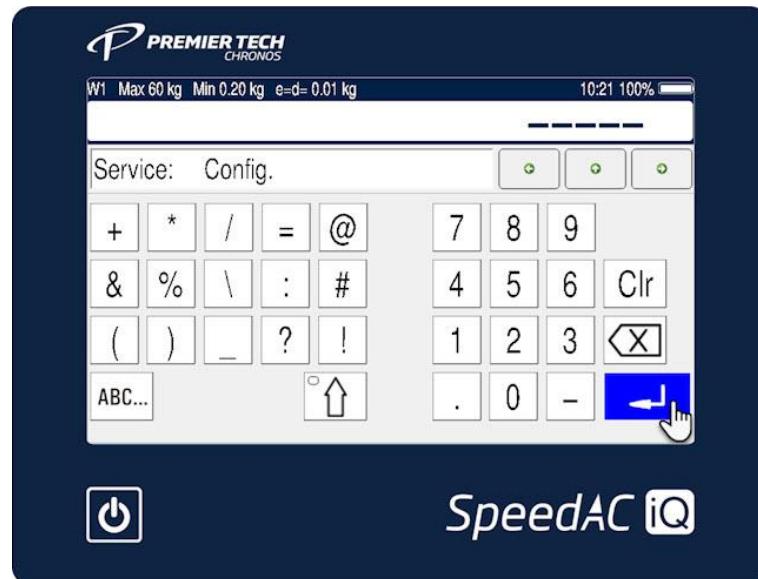


Figure 3: Service Mode Configuration Screen Access

- Locate the **Fieldbus** option and validate as per **Figure 4**.

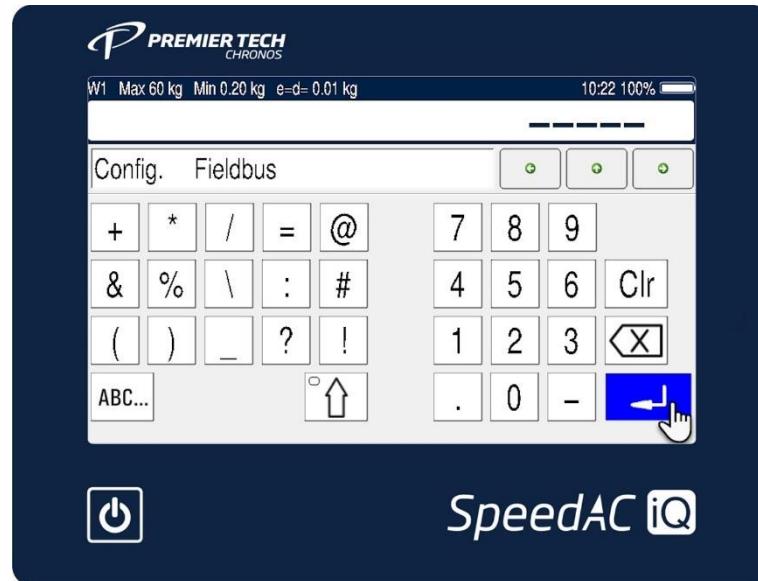


Figure 4: Fieldbus Configuration Screen Access

- Locate the **ETHERNET IP** option and validate as per **Figure 5**.

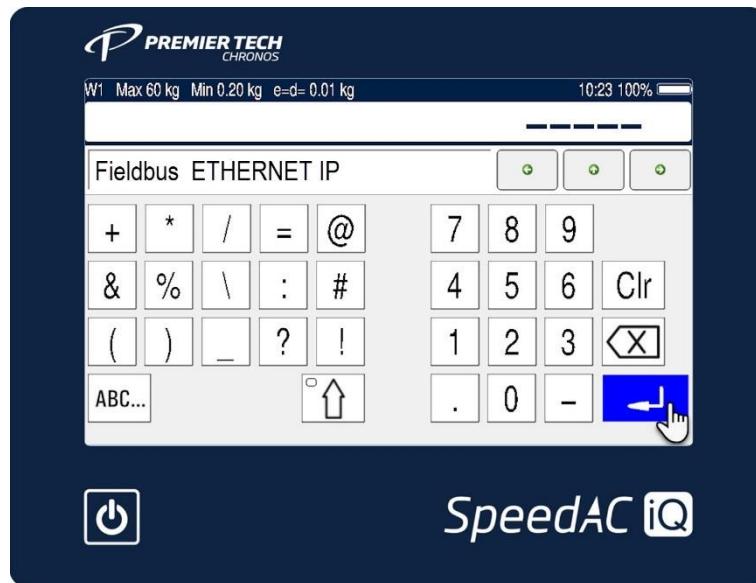


Figure 5: Ethernet IP Selection and Validation Screen

- Download and install the **Ethernet Device Configuration (EDC) Tool (Hilscher EthernetDeviceConfiguration_V1.0900.1.5857_Setup.msi)** from SpeedAC iQ Knowledge Base under Software library: **EDC TOOL.zip**.
- Run the **Ethernet Device Configuration** tool.
- Click on **Search Devices** button to locate your EXT card (see **Figure 6** below).

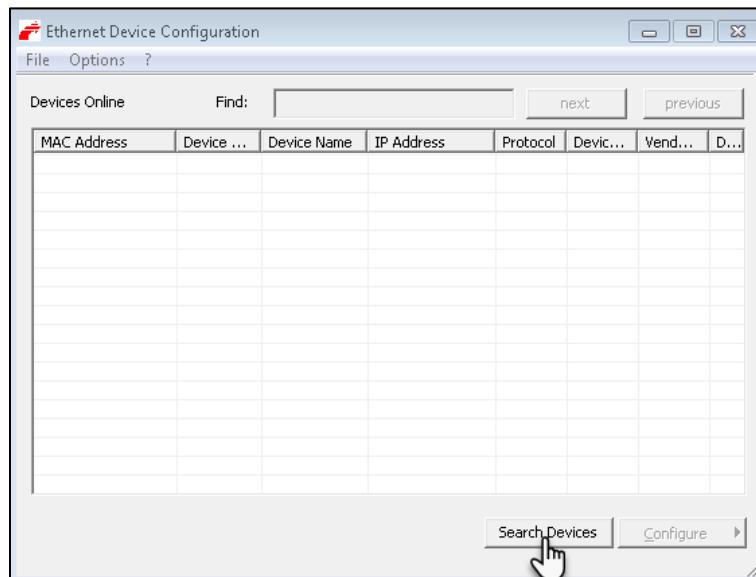


Figure 6: EDC Search Screen

Note that there is no IP address assigned to your device yet (**Figure 7**).

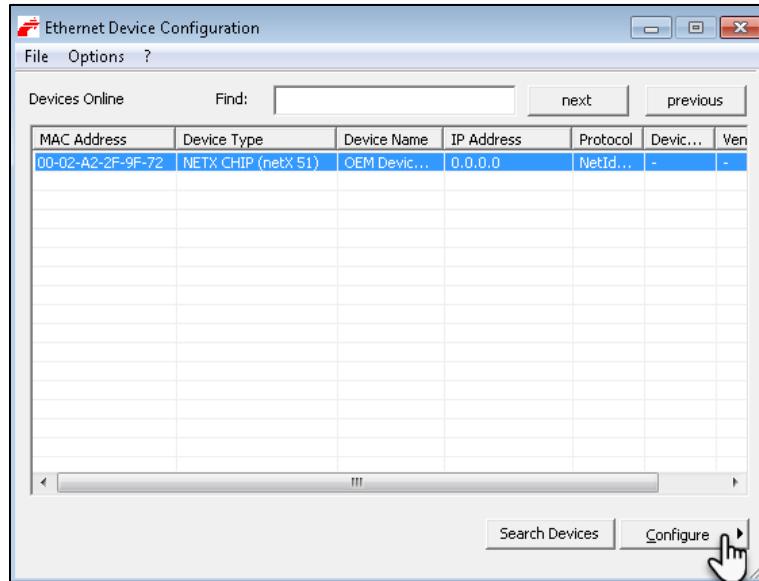


Figure 7: EDC Device Detection Screen with Empty IP

- Click on **Configure** button and select **Set IP Address** from the drop-down list.
- Enter the **IP Address** (e.g: 172.19.48.60) and the **Subnet Mask** as well as mentioned in **Figure 8** below.

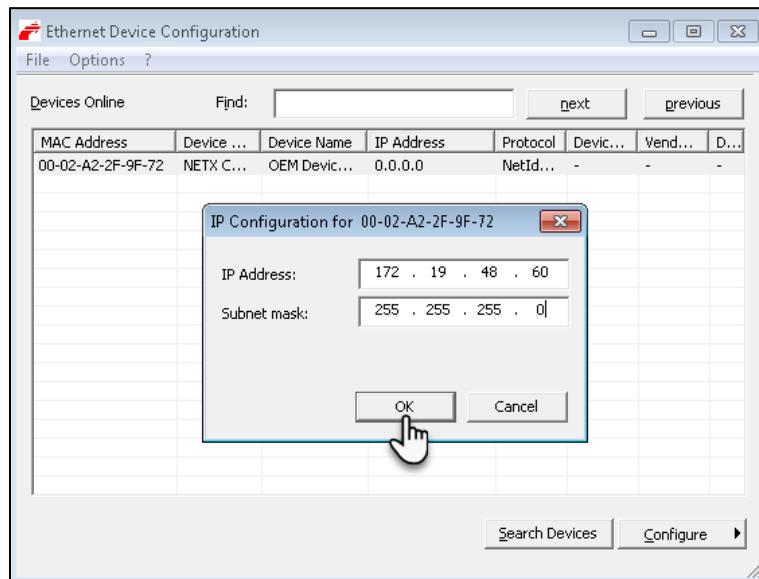


Figure 8: EDC IP Address and Subnet Mask Setup

- In case you get a timeout error on setting up the IP address (as per **Figure 9**) you will need to check again if the **Fieldbus** option is correctly selected in the **Service mode** configuration in the current section (**Figure 5**).

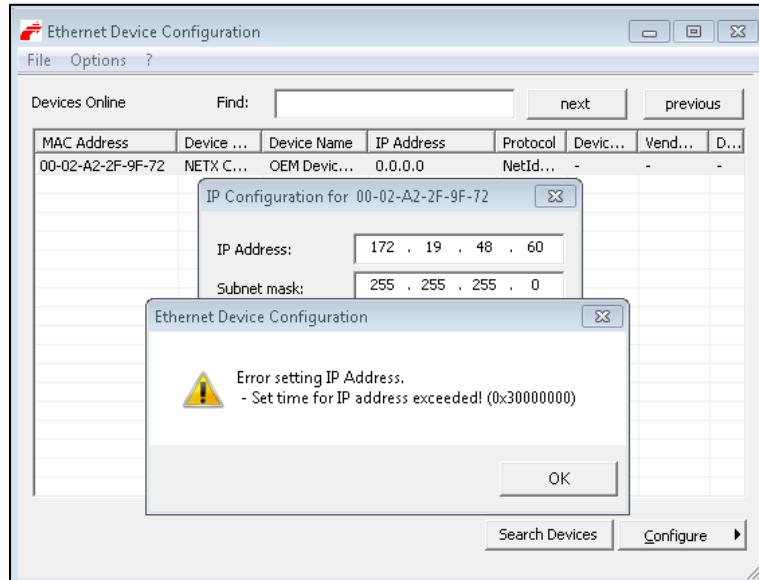


Figure 9: EDC IP Address Error or Timeout

Once the IP is correctly setup it will be visible in the IP Address list view tag of the **Ethernet Device Configuration** window (see **Figure 10** below).

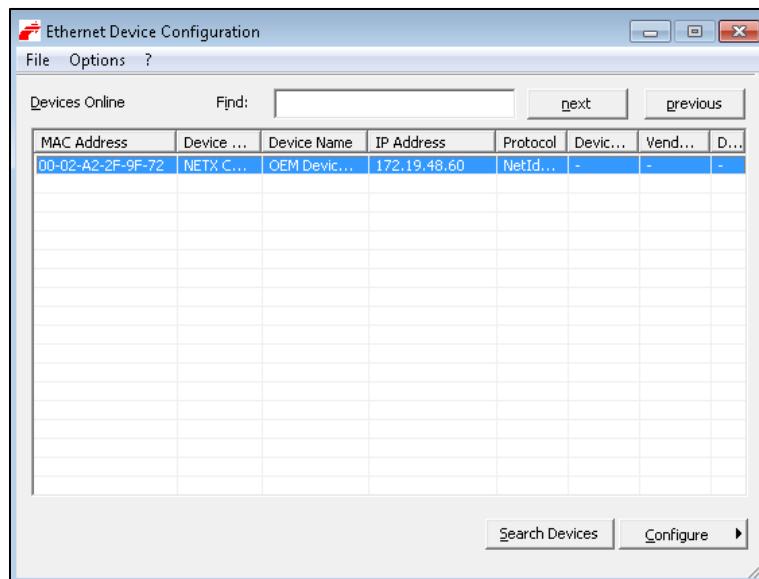


Figure 10: EDC IP Address Confirmation

2.2. Configuring the PLC using Rockwell Software

This part describes all the prerequisites for configuring the PLC communication with the SpeedAC iQ Controller.

2.2.1. EDS File Setup

The Electronic Data Sheet (EDS) file **Systec NETX 51-RE EIS V1.1.EDS** can be downloaded from the **Software** library under: **EDS - ETHERNET IP.zip**.

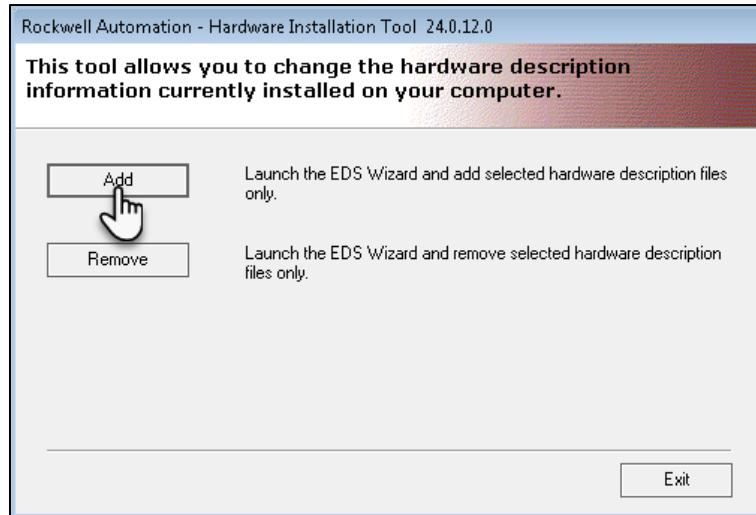


Figure 11: EDS Hardware Installation Tool Main Screen

- Run the EDS Installation Tool from the RSLinx Tools folder using the following path:
Start Menu → All Programs → Rockwell Software → RSLinx → Tools
- Click on **Add** button to bring up the **Registration** window (see **Figure 11**).

- Browse the location of the EDS file on your computer (**Figure 12**).

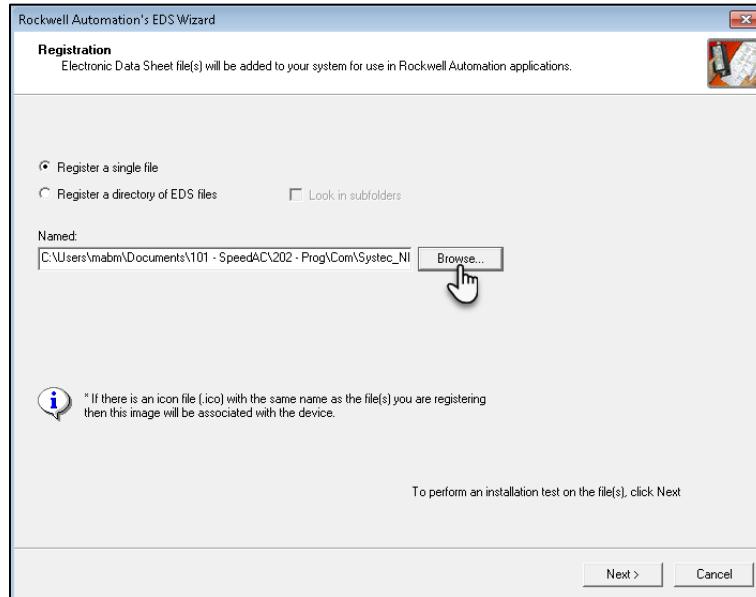


Figure 12: EDS File Browsing Location

- Continue the setup by clicking the **Next** button on the next screen and make sure that there is a green checkmark on the box the EDS file as per **Figure 13**.

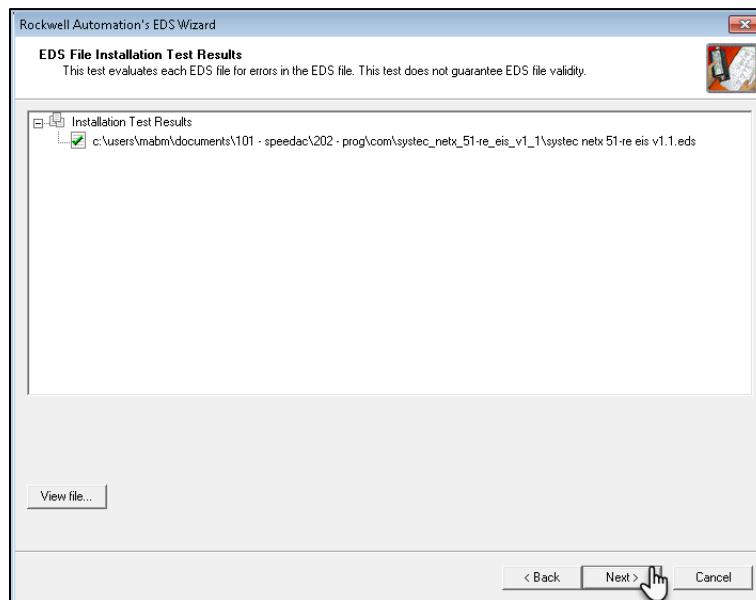


Figure 13: EDS File Test Results Screen

- Click on next again unless you need to change the graphic image associated with the device (see **Figure 14**)

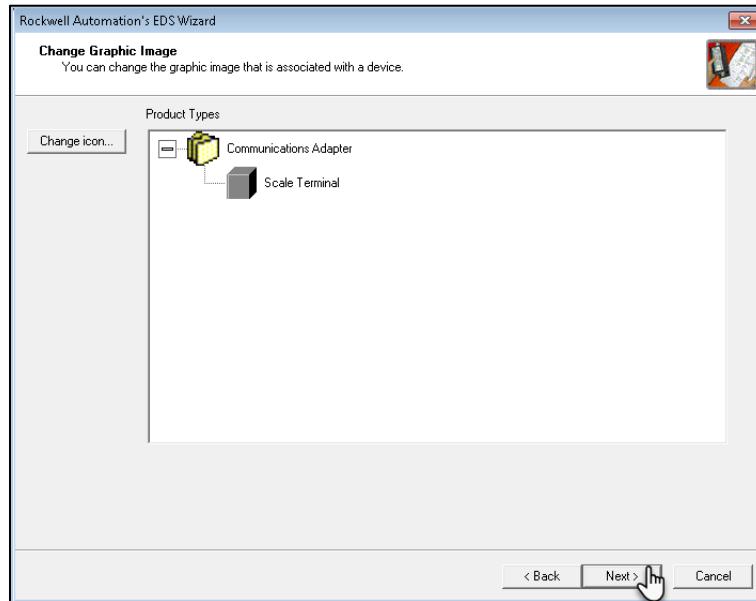


Figure 14: EDS File Device Image Change Screen

- Click on **Next** again to register your device as per **Figure 15** below.

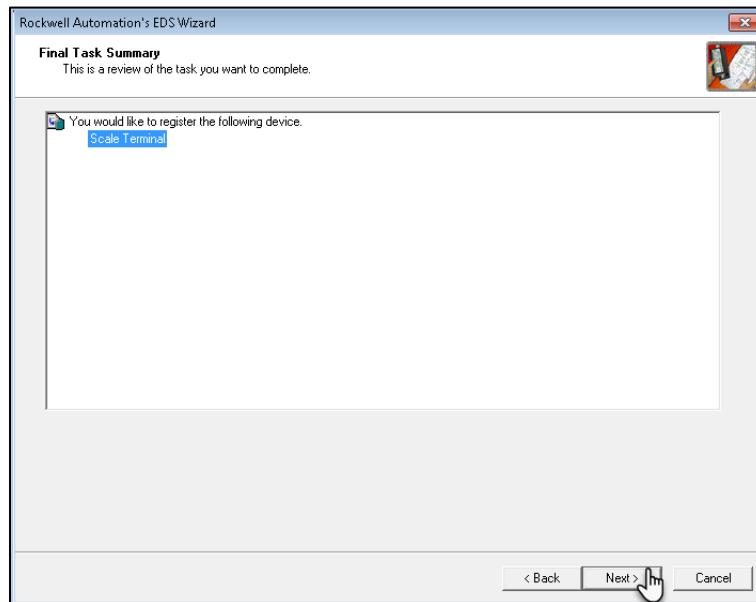


Figure 15: EDS File Device Registration Screen

- Click on **Finish** button to complete this setup.

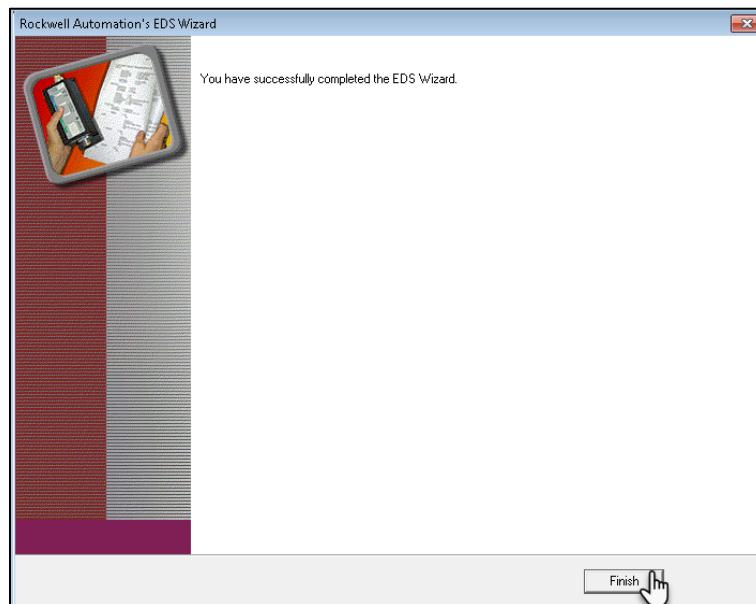


Figure 16: EDS File Setup Complete

2.2.2. RSLinx Configuration Drivers

Open RSLinx Classic on your desktop and locate the **Configure Drivers** either by using the path from the navigation bar:

Communications → Configure Drivers

Or by clicking on the **Configure Drivers** icon as per **Figure 17** below.

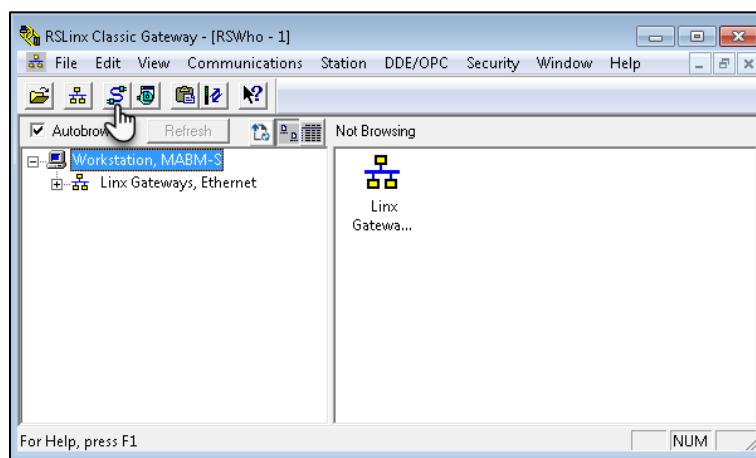


Figure 17: Configure Drivers Access Screen

Then, apply the following steps:

- [1] Click on the arrow and select **Ethernet/IP Driver** from the drop-down list.
- [2] Click on the **Add New** button to add the new driver to the **Configured Drivers** list.
- [3] Click on the **OK** button to validate the default driver name or enter a name of your choice.

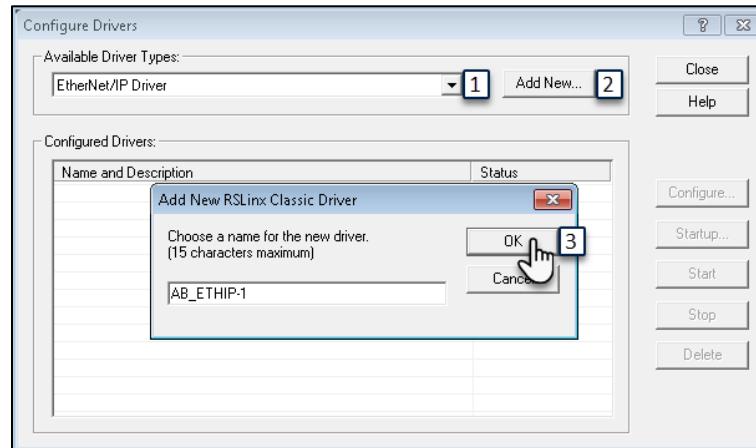


Figure 18: Driver Configuration and Validation Screen

- Select your computer network card as per **Figure 19**.

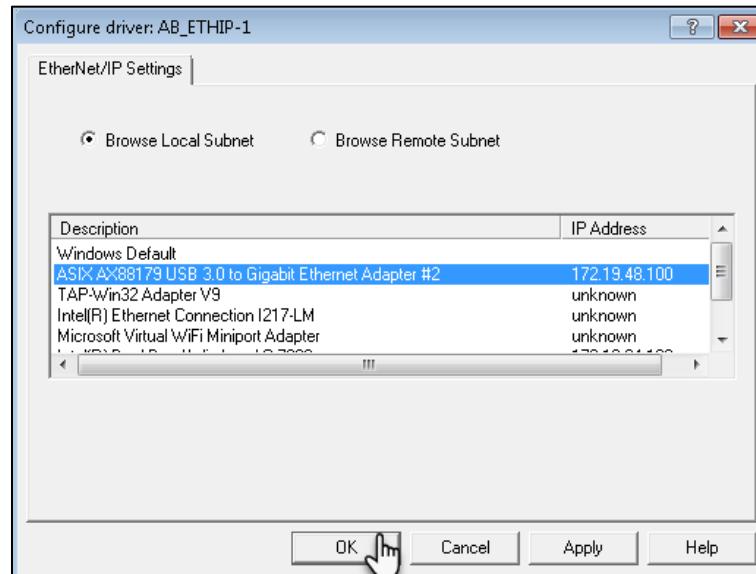


Figure 19: Network Card Selection

- **Figure 20** shows the new driver status as **Running** in **Configured Drivers** list view.

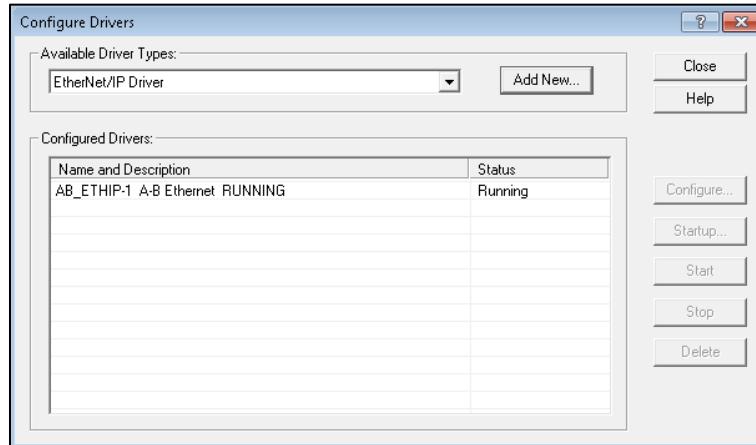


Figure 20: Configured Drivers List View

- Check which devices are now accessible via the network bridge either by using the following path from the navigation bar:
Communications → RSWho

Or

- Click on **RSWho** icon as per **Figure 21**.
- Now, we have access to the **Scale terminal** and PLC whose IP Address are 172.19.48.60 and 172.19.48.73 respectively (see **Figure 21**).

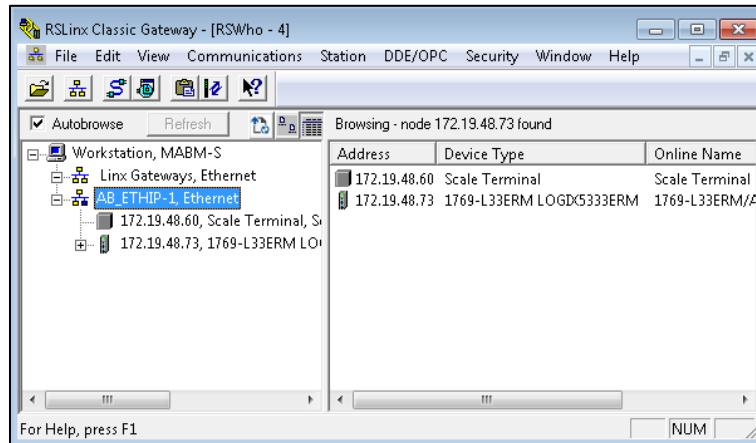


Figure 21: Scale Terminal Visibility

2.3. Accessing Scale Terminal Data

This part describes in few steps how to access SpeedAC iQ data from the PLC.

2.3.1. Preliminary Steps

- Open RSLogix and create a new program (e.g: SPEEDACIQ_REGISTRY_ACCESS as per **Figure 22** below).

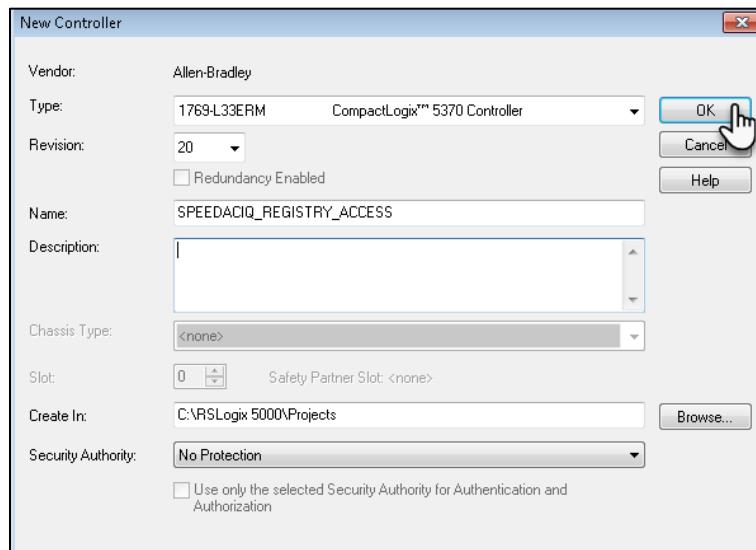


Figure 22: New Program Creation Window

- Add a new **Ethernet Module** and put a checkmark in the field tagged **Systec ... GmbH**, hit the **Create** button to complete this step (see **Figure 23**).

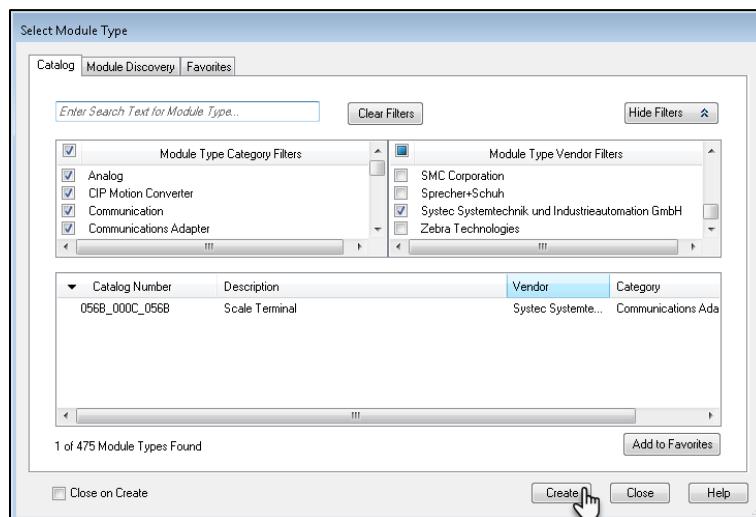


Figure 23: Ethernet Module Choice Window

- Give a name to your new module and set its **IP address** as well. Please refer to section 2.2.2 for further details (see **Figure 24**).

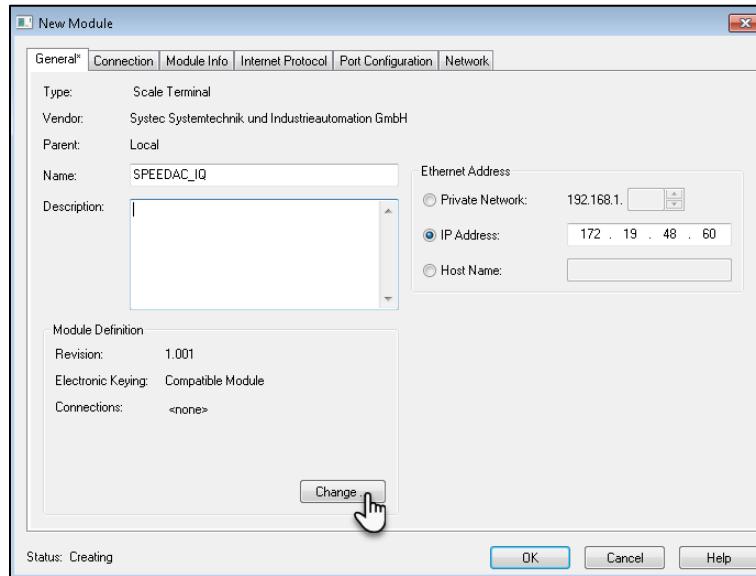


Figure 24: Network Parameter Module Window

- Then click on **Change** button to set a connection type as per **Figure 25**.
- [1] Select **Exclusive Owner** from the drop-down list.
- [2] Select the **Size** of your data as an **INT**.
- [3] Click on **OK** to continue.

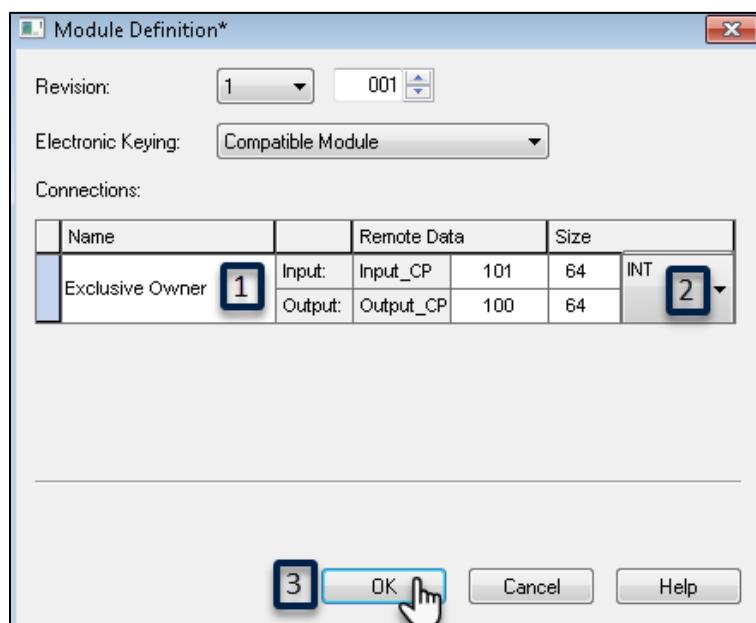


Figure 25: Module Definition Window

- Click on **Yes** to apply changes to the module (see **Figure 26**).

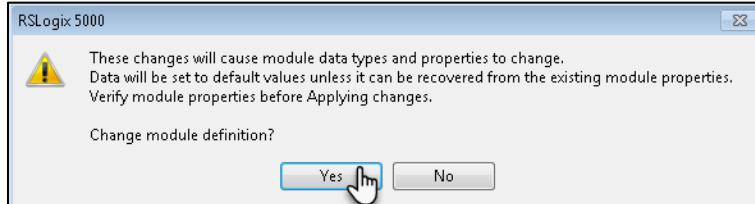


Figure 26: Module Definition Validation Window

The **SPEEDAC_IQ** module is now created and visible as per Figure 27.

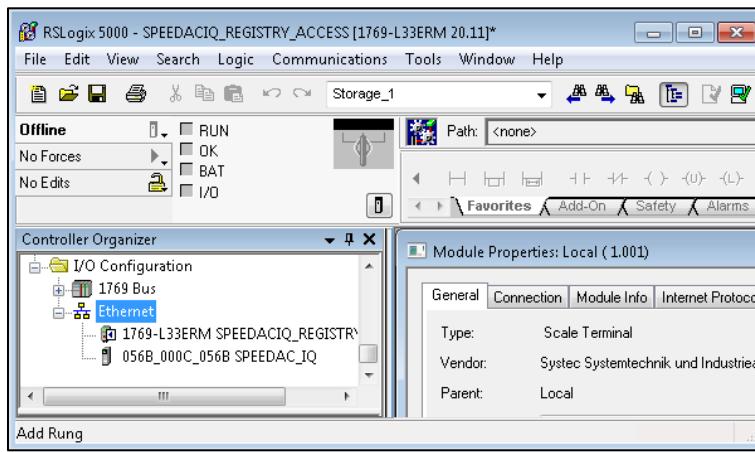


Figure 27: New Module Setup Complete

2.3.2. Managing Data Words

Let's create a simple instruction to copy Weigh Unit data string from **SPEEDAC_IQ:I.Data[10]** to a new variable **WEIGH_UNIT** (see **Figure 28**).

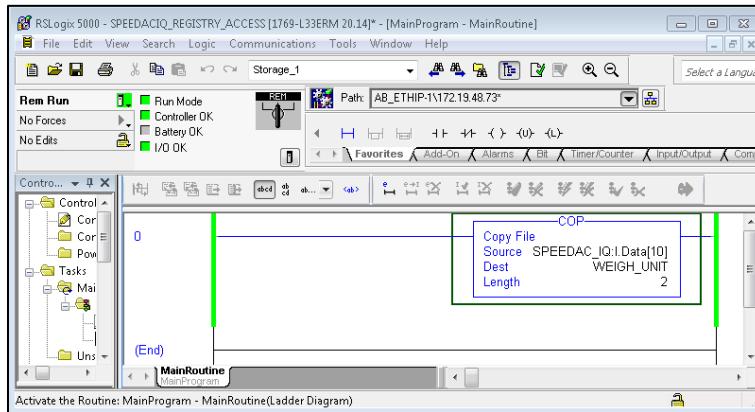


Figure 28: Routine for WEIGH_UNIT Data Reading

Now, we can download the program to the PLC and switch online to access these data from the **Controller Tags** list view as shown in **Figure 29**.

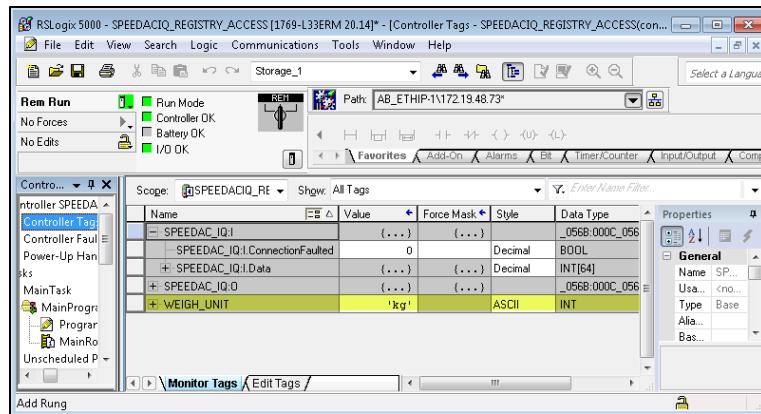


Figure 29: Controller Tags Data Reading

3. Modbus TCP Configuration - Data Access via Ethernet Port

In this part, we are going to learn how to manipulate the SpeedAC iQ Data Words from the **Fieldbus Modbus TCP**.

3.1. Preliminary Steps on SpeedAC iQ Controller

Please follow the steps described in section 2.1 for the Service Mode to establish the Modbus TCP connection with the PLC as per **Figure 30**.

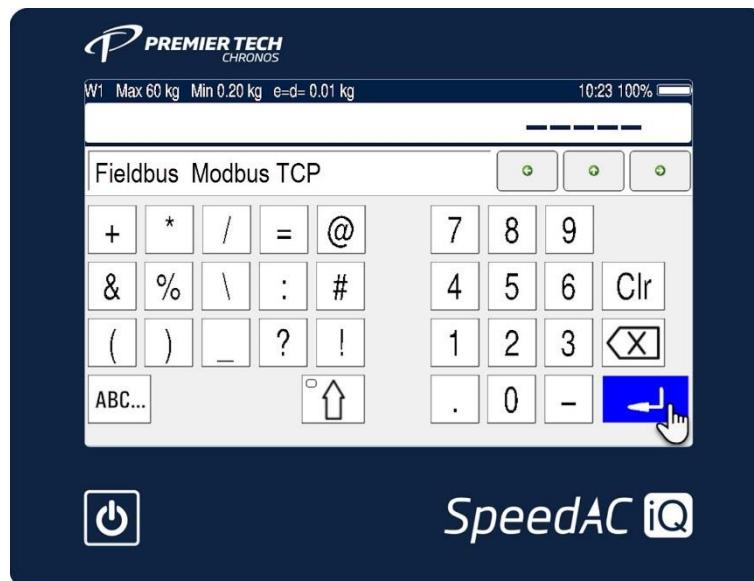


Figure 30: Selecting Modbus TCP Option

- Exit the Service Mode using the up arrow in the middle. The SpeedAC iQ Controller will restart to apply changes.

3.2. Accessing Data Words

Once the steps above have been successfully completed, we can now move on the second part to read or write data from the PLC on the SpeedAC iQ Controller as Server (Slave). The following precautions must be carefully applied:

- Make sure to have the SpeedAC iQ Controller IP address set in the same range as per the PLC's (e.g: 192.168.25.x).
- Set the **Port** value to **502** (this port is automatically enabled when **Modbus TCP** is selected in **Service Mode**).
- Set **Slave ID** to **1**.
- Set the **Function Code** value to **3 (Read Data)**.
- Set your **First Register** to **0**.
- Set the **Number of Registers** to **64**.
- Set the **Register Size** to **16 Bits**.
- Set the **Minus Offset** to **0**.

Figure 31 shows the first 10 registers accessed from PLC with their data content. The **Live Weight** on the sixth register is 22 kg.

Data Type	Register#	Bytes	Results	Comments
16bit INT	0	0258	600	Automatic Mode
16bit INT	1	0007	7	Ready to Discharge
16bit INT	2	0000	0	
16bit INT	3	0000	0	
16bit INT	4	0000	0	
16bit INT	5	0000	0	
32bit Float	6	41B0 0000	22.000000	Live Weight
16bit INT	8	0430	1072	
16bit INT	9	0002	2	Active Weigh Program
16b String2	10	6B67	kg	Weigh Unit
16bit INT	11	000B	11	
16bit INT	12	0140	320	Command - READ
16bit INT	13	0020	32	Param - Auto Page Data

Figure 31: Reading from SpeedAC iQ Data Register

- Set the **Function Code** value to **16 (Write Data)**.

Let's say that we are willing to know what page of the SpeedAC iQ Controller is currently displayed on the screen.

The registers **12** and **13** are respectively linked to **Command** (WRITE = 304, READ = 320) and **Parameters**.

The actual parameter is **32** for **Auto Page Data** (see **Figure 31**).

Access the **Report Page** by writing their Command and Parameter from the PLC (320 and 40 respectively as per **Figure 32**).

Data-Write	Register#	Bytes
320.0000	0	0140
40.0000	1	0028
0.0000	2	0000
0.0000	3	0000
0.0000	4	0000

Figure 32: Data Write to SpeedAC iQ Controller

The results are shown in **Figure 33** below as per updated fields in registers 12 and 13.

Data Type	Register#	Bytes	Results	Comments
16bit INT	0	0258	600	Automatic Mode
16bit INT	1	0007	7	Ready to Discharge
16bit INT	2	0000	0	
16bit INT	3	0000	0	
16bit INT	4	0000	0	
16bit INT	5	0000	0	
32bit Float	6	41B0 0000	22.000000	Live Weight
16bit INT	8	0420	1056	
16bit INT	9	0002	2	Active Weigh Program
16b String2	10	6B67	kg	Weigh Unit
16bit INT	11	000B	11	
16bit INT	12	0140	320	Command - READ
16bit INT	13	0028	40	Param - Report Page
32bit Float	14	4220 0000	40.00000	
32bit Float	16	41B0 0000	22.000000	

Figure 33: Reading Report Page Data

4. PROFINET Configuration - Data Access

This section briefly describes the way to access the Data Words from the SpeedAC iQ using **PROFINET** Fieldbus module.

Note: As this content is related to Siemens material and software, we recommend you to check their Industry Online Support webpage to get the assistance for configuring your devices and install the required software at:

<https://support.industry.siemens.com/cs/start?lc=en-WW>.

4.1. Preliminary Steps on SpeedAC iQ Controller

Make sure you have correctly installed the IT8000ET PROFINET card module on the SpeedAC iQ Controller Mainboard referenced either PNU or PNX depending on the card you own. Then, connect a RJ45 cable to one of the slots X2 or P1 (X3 or P2 respectively as per **Figure 34**).

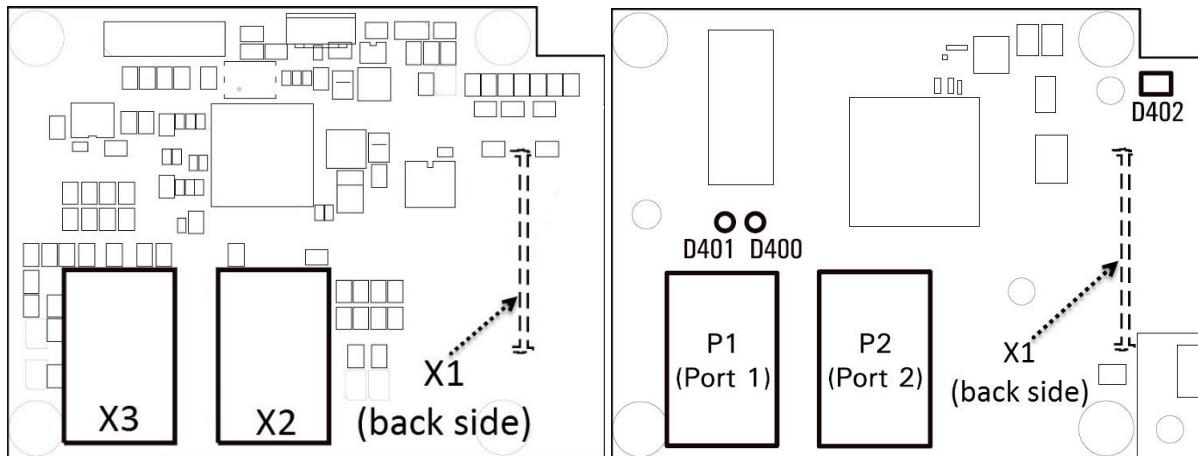


Figure 34: Connection of PROFINET Modules PNU and PNX (left to right respectively)

Please follow the steps described in section 2.1 for the **Service Mode** to establish the PROFINET connection with the PLC as per **Figure 35**.

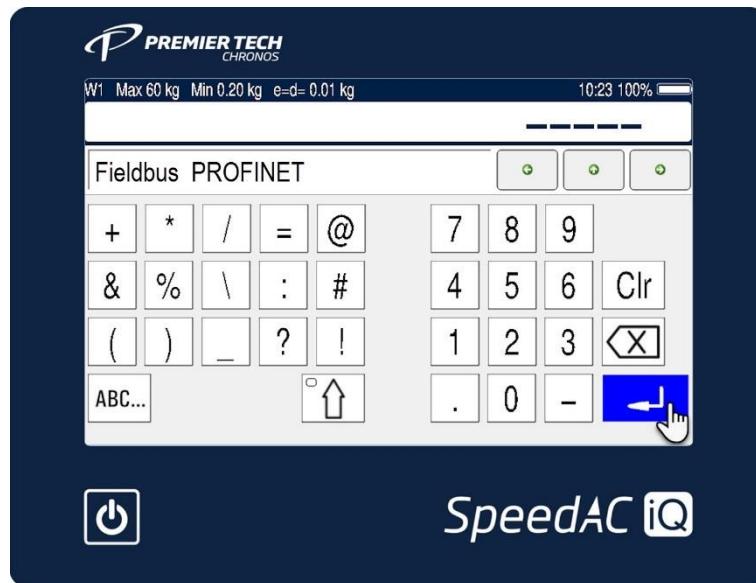


Figure 35: Selecting PROFINET Option

- Exit the **Service Mode** using the up arrow in the middle. The SpeedAC iQ Controller will restart to apply changes.

4.2. Accessing Data Words

In this section, **TIA Portal v13** software from Siemens will be used to configure the access to the SpeedAC iQ Controller Registers via the **PLC 1211C** family (catalog number: **6ES7 211-1AE40-0XB0**).

- Open **TIA Portal** or a Siemens compatible software and create a new project by adding your PLC with an IP address in the range of IP of your PC as well. The IP address of the PC for this example is 192.168.25.50. **Figure 36** shows the IP setup for our PLC.

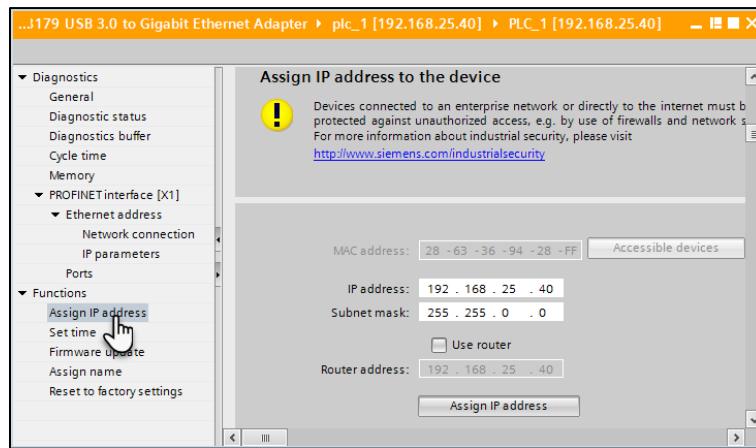


Figure 36: PLC IP Address Assignment Screen

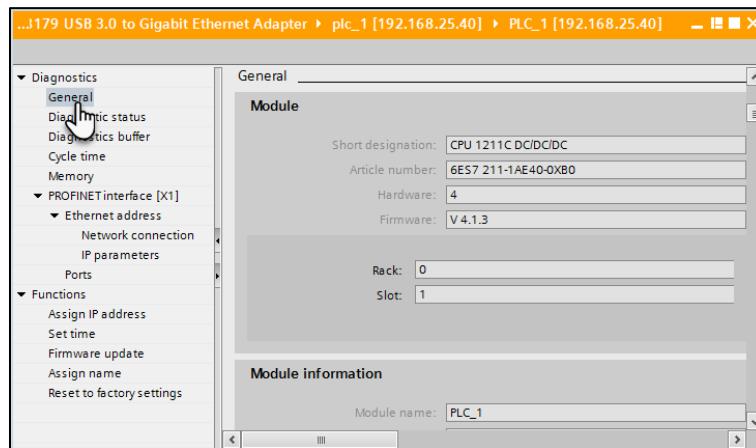


Figure 37: PLC General Information Screen

- Assign an IP address and a name to your SpeedAC iQ controller.

Note: The name chosen for the controller must reflect as the same in all part of the SpeedAC iQ device configuration. The name used for the SpeedAC iQ controller is **speedaciq1** and its IP address **192.168.25.60** (see **Figure 38** to **Figure 40**).

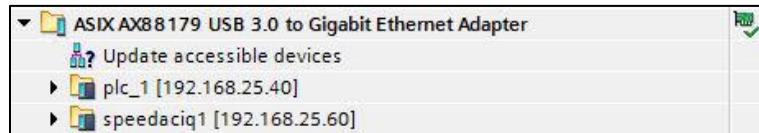


Figure 38: SpeedAC iQ Name and IP Address on Network Card Adapter View

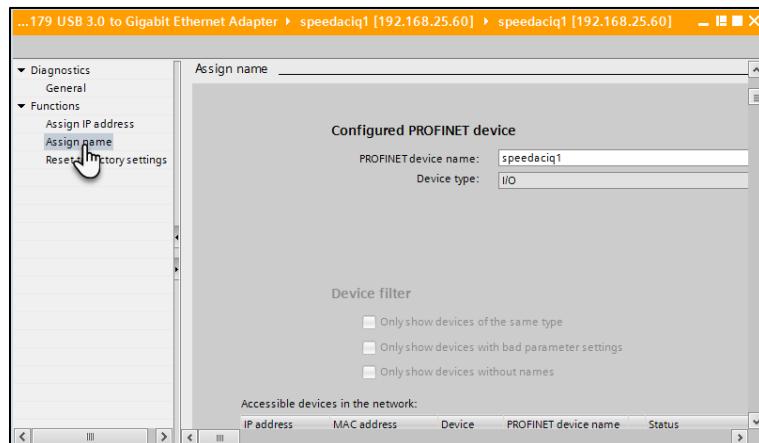


Figure 39: SpeedAC iQ Name Assignment Screen

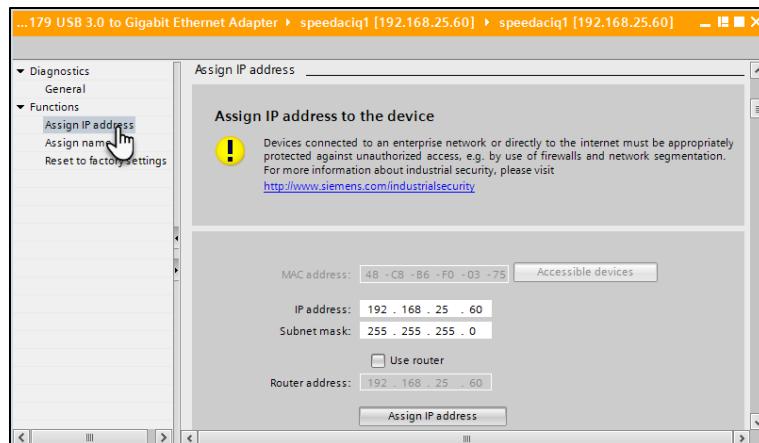


Figure 40: SpeedAC iQ IP Address Assignment Screen

- Make sure to download the GSD file (General Station Description) from our SpeedAC iQ knowledge Base (**GSDML-V2.32-SysTec GmbH 0241-IT8000ET_PNX-20170522.xml**), which contains a description of the PROFIBUS DP/PA or PROFINET device and provides you a way for an open configuration tool to automatically get the device features. The file can be downloaded from the **Software library** under: **GSD - PROFINET PNX.zip**.

- Follow the steps to install the GSD file in TIA Portal project by running the **Install General Station Description** wizards from the **Option** tab on your software. The install screen should look like the one shown in **Figure 41**.

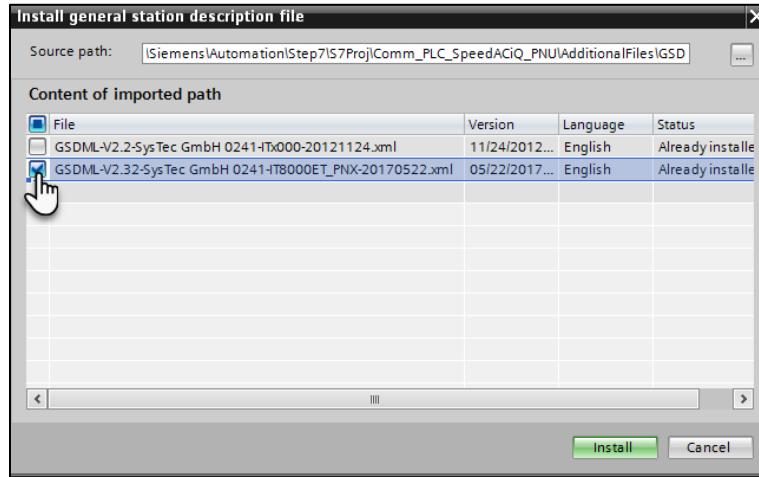


Figure 41: GSD File Install Screen

- Then, check that the package is successfully installed and available in the software catalog list view as per **Figure 42**.

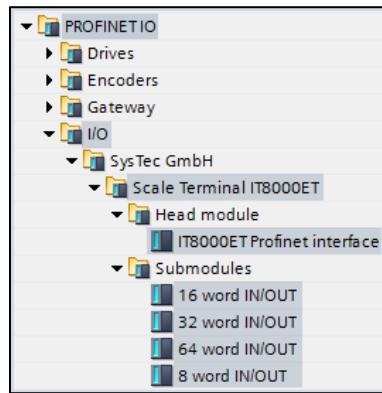


Figure 42: IT8000ET GSD File Catalog List Screen

- Download your project to the PLC and ensure that your CPU is toggled to RUN mode as per **Figure 43**.



Figure 43: PLC in RUN Mode Screen

- Use the **Watch and Force Tables** to add a new **Watch table_1** as shown in **Figure 44**.

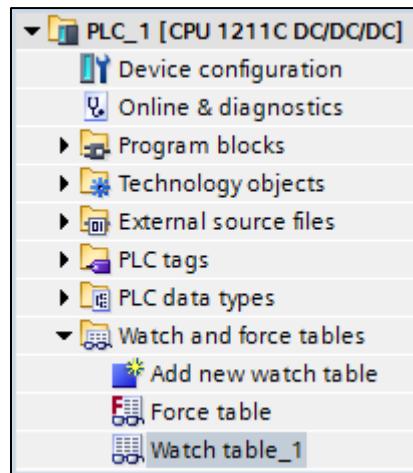
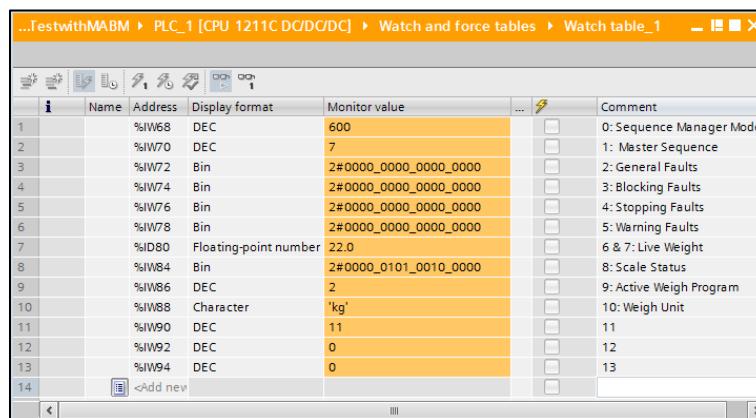


Figure 44: Watch Table_1 Screen

- Refer to the **Communication Parameters Table** in the current document to add the input values to be monitored as described in **Figure 45**.



The screenshot shows the 'Watch table_1' dialog box. It contains a table with columns: #, Name, Address, Display format, Monitor value, ..., and Comment. The table lists 14 rows of monitored variables:

#	Name	Address	Display format	Monitor value	...	Comment
1	%IW68	DEC	600			0: Sequence Manager Mode
2	%W70	DEC	7			1: Master Sequence
3	%W72	Bin	2#0000_0000_0000_0000			2: General Faults
4	%W74	Bin	2#0000_0000_0000_0000			3: Blocking Faults
5	%W76	Bin	2#0000_0000_0000_0000			4: Stopping Faults
6	%W78	Bin	2#0000_0000_0000_0000			5: Warning Faults
7	%D80	Floating-point number	22.0			6 & 7: Live Weight
8	%W84	Bin	2#0000_0101_0010_0000			8: Scale Status
9	%WB6	DEC	2			9: Active Weigh Program
10	%W88	Character	'kg'			10: Weigh Unit
11	%W90	DEC	11			11
12	%W92	DEC	0			12
13	%W94	DEC	0			13
14	<Add new>					

Figure 45: SpeedAC iQ Inputs Watch Table_1

5. Profibus DP Configuration - Data Access

This part briefly describes the way to access the Data Words from the SpeedAC iQ using Profibus DP Fieldbus module.

Note: The same advice as for section 5 is applicable in this part regarding the fact of using Siemens material and software. We recommend you to check their Industry Online Support webpage for further details at:

<https://support.industry.siemens.com/cs/start?lc=en-WW>.

5.1. Preliminary Steps on SpeedAC iQ Controller

Make sure that you have correctly installed the IT8000ET Profibus DP card module on the SpeedAC iQ Controller Mainboard referenced either PBU or PBX depending on the card you own (see **Figure 46**).

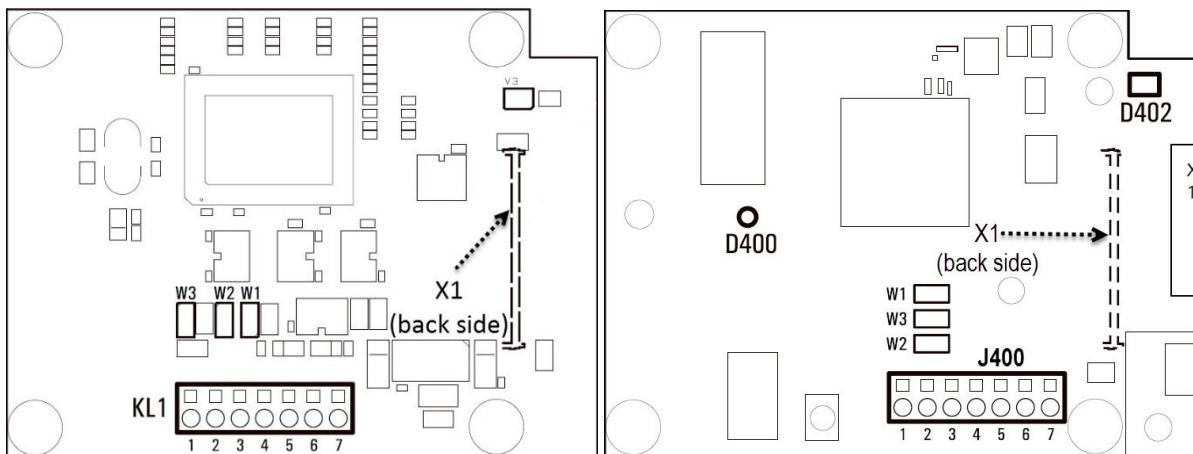


Figure 46: Connection of Profibus DP Modules PBU and PBX (left to right respectively)

Note: The following information is crucial to validate the wiring on the circuit board.

- KL1 connection 4 and 6 are bridged on the circuit board as 5 and 7 as well to make easy the connection of other devices on Profibus DP if required (this is also applicable for the connector J400 on PBX card).
- Connection 2 and 3 are only used for the terminating resistor (if you use an external terminating resistor)

Please refer to the **Connection of Profibus Module PBU/PBX** section in IT8000ET Technical Manual for further details.

Please follow the steps described in section 2.1 for the **Service Mode** to establish the Profibus DP connection with the PLC as per **Figure 47**.

Once the **Profibus DP** Fieldbus communication is selected, we need to set and validate the **Address** on the next screen that will be used by the PLC to communicate with the SpeedAC iQ controller (see **Figure 48**).

With the PBU expansion module, the weighing terminal operates as a Profibus DP slave with an I/O interface (up to 64 inputs and outputs) or a data interface with up to 64 input words and up to 64 output words.

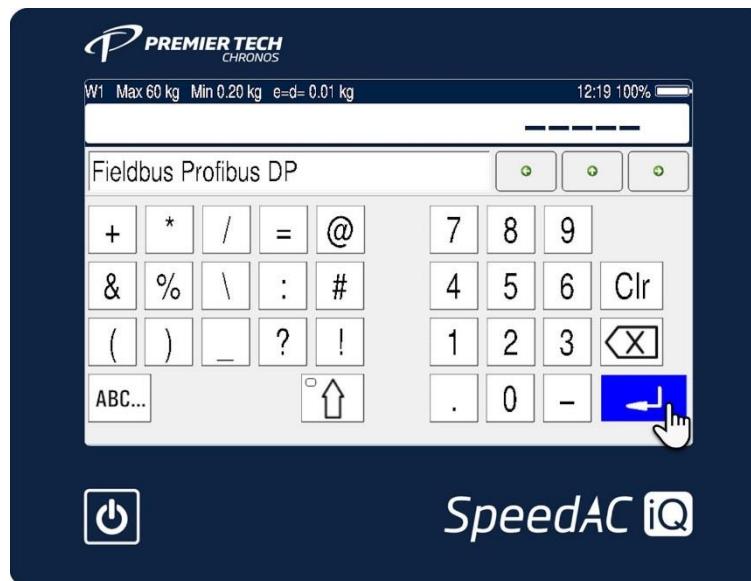


Figure 47: Selecting Profibus DP Option



Figure 48: Selecting Profibus DP Address

5.2. Accessing Data Words

We keep using the same material configuration as the one in section 4 to collect our data from the PLC with **TIA Portal v13** software from Siemens in this part.

- Open our existing program to add and configure the features of the Profibus DP card.
- Make sure that you've downloaded the GSE Catalog file (**IT8ET46C.gse**) from our SpeedAC iQ knowledge Base, which contains a description of the PROFIBUS DP/PA. The file can be downloaded from the **Software library** under: **GSD - PROFIBUS GSE.zip**.
- Run the **Install General Station Description** wizards from the **Option** tab on your software. The install screen should look like the one shown in **Figure 49**.

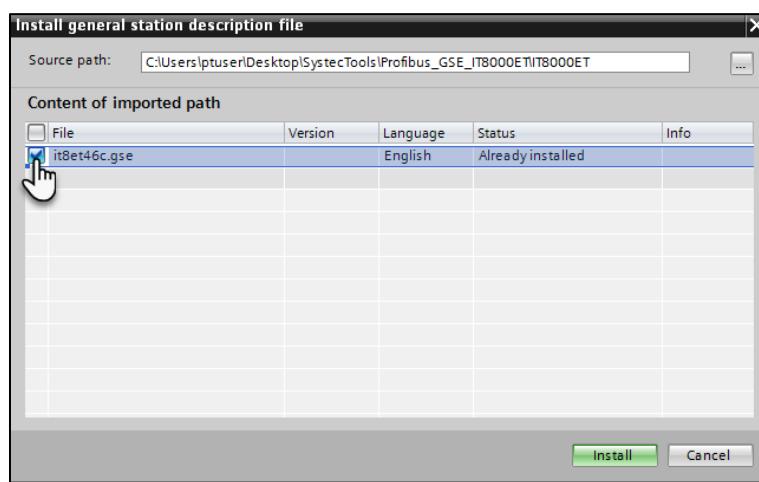


Figure 49:Catalog File Install Screen

- Then, check that the package is successfully installed and available in the software catalog list view as per **Figure 50**.

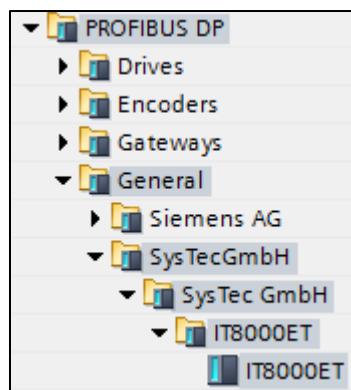


Figure 50: GSD File List View

- Add the SpeedAC iQ controller to your network and assign a name to this device (e.g: speedaciqb as per **Figure 51**).

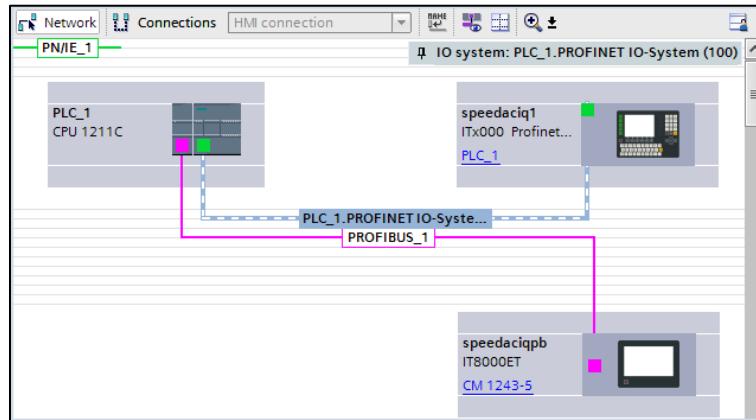


Figure 51: Network View of SpeedAC iQ with Profibus DP

- Check that the **Address** value is the same as the one entered in the Service Mode from section 5.1 (see **Figure 52**).

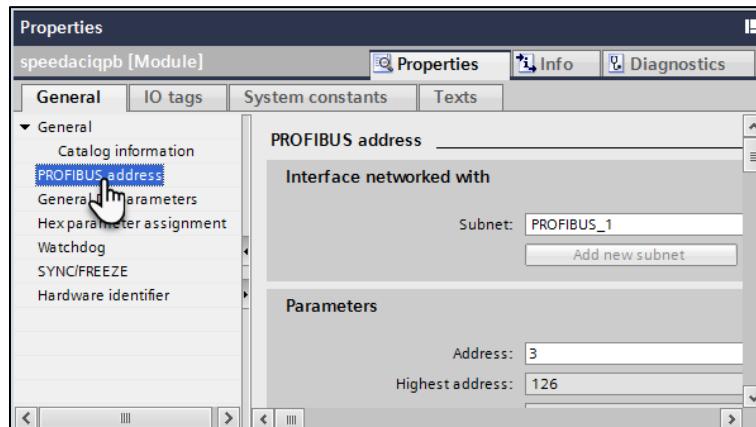


Figure 52: SpeedAC iQ Profibus DP Address Screen

- Add inputs and outputs range to be monitored from the catalog list (see **Figure 53**).

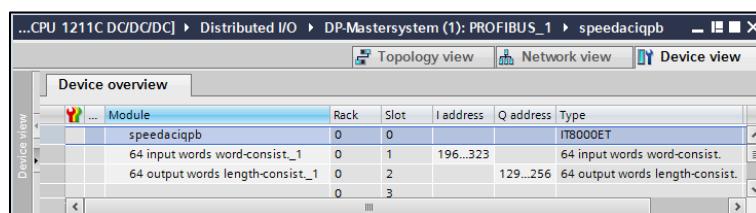


Figure 53: I/O Range for Monitoring

- Download the program to the PLC and switch to RUN mode. Now you can generate a new **Watch_Table2** from the **Watch and force tables** option (see **Figure 54**).

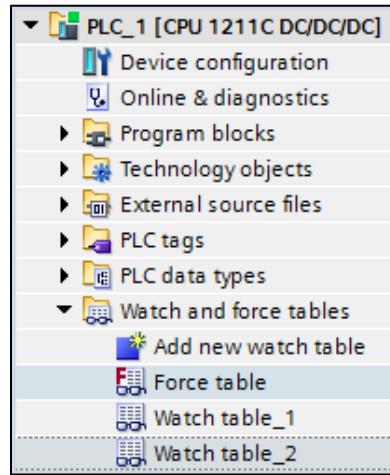
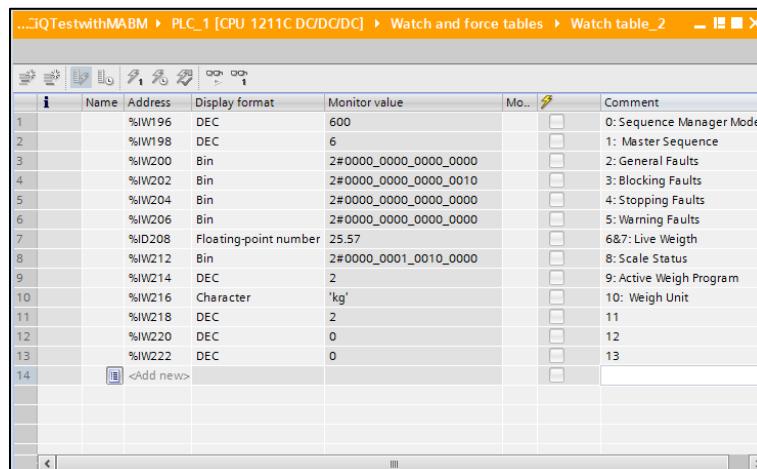


Figure 54: Watch Table_2 Screen



The screenshot shows the "Watch table_2" screen with a table listing various monitoring entries. The columns are labeled: #, Name, Address, Display format, Monitor value, Mo..., and Comment. The table contains 14 rows of data, with row 14 being a blank entry for adding a new item.

#	Name	Address	Display format	Monitor value	Mo...	Comment
1	%IW196	DEC		600	<input type="checkbox"/>	0: Sequence Manager Mode
2	%IW198	DEC		6	<input type="checkbox"/>	1: Master Sequence
3	%IW200	Bin		2#0000_0000_0000_0000	<input type="checkbox"/>	2: General Faults
4	%IW202	Bin		2#0000_0000_0000_0010	<input type="checkbox"/>	3: Blocking Faults
5	%IW204	Bin		2#0000_0000_0000_0000	<input type="checkbox"/>	4: Stopping Faults
6	%IW206	Bin		2#0000_0000_0000_0000	<input type="checkbox"/>	5: Warning Faults
7	%ID208	Floating-point number		25.57	<input type="checkbox"/>	6>: Live Weigh
8	%IW212	Bin		2#0000_0001_0010_0000	<input type="checkbox"/>	8: Scale Status
9	%IW214	DEC		2	<input type="checkbox"/>	9: Active Weigh Program
10	%IW216	Character		'kg'	<input type="checkbox"/>	10: Weigh Unit
11	%IW218	DEC		2	<input type="checkbox"/>	11
12	%IW220	DEC		0	<input type="checkbox"/>	12
13	%IW222	DEC		0	<input type="checkbox"/>	13
14	<Add new>					

Figure 55: SpeedAC iQ Inputs Watch Table_2

Block Command Format

Read/Write request from Fieldbus device

Description	Output Register offset	Data Type	States	Comments
Command number	0	Float (32 bits)	304 = Write, 302 = Read	
Parameter data	2	Float (32 bits)	parameter #	see table "SpeedAC iQ Bagging Communication Parameters"
Value	4	Float (32 bits)	value #	see table "SpeedAC iQ Bagging Communication Parameters"
Handshake	6	Float (32 bits)	any value	Used to "handshake", see Scale Status bit 9

Description	Input Register offset	Data Type	States
Command Status	14	Float (32 bits)	Command Status # = Command executed correctly Command Status # + 100 = Could not execute Command - invalid state or value out of range 100 = invalid request 200 = action cannot be perform twice in a row -1 = String or requested action out of range length of string if string is requested

SpeedAC iQ Bagging Communication Parameters

This file takes effect from version NXT 1.03.01

Fieldbus Output register				Fieldbus Input register			
Command number	Parameter	Value	Description	Register offset	Data Type	States	Comments
Set	Read						
Write Commands							
304	31	0	No operation				
		20	Reset Production Report				
		22	Reset Batch Report				
		30	Start				
		31	Stop				
		32	Manual Discharge				
		33	Cancel Cycle				OFF mode
		34	Clear Fault				
		35	Check Weight State				Toggle Check Weigh on-off
		37	Hopper State				Toggle Hopper Refill on-off
		40	Zero the Scale				
304		32	#	WP Number		# = number of the desired Weigh Program	Machine must be in OFF mode
Live Information (Read)							
			Sequence Mode Manager	0	Integer (16 Bits)	100 = Off Mode	
						200 = Stop Mode	
						300 = Stopping Mode	
						400 = Manual Mode	
						500 = Preparation Mode	
						600 = Automatic Mode	
						1 = Initial Sequence	
						2 = Zero Scale Before Weighment	
			Master Sequence	1	Integer (16 Bits)	3 = Feeding Scale	
						4 = Sample Weighment	
						5 = Topup	
						6 = Out of Tolerance	
						7 = Ready to Discharge	
						8 = Discharging	

SpeedAC iQ Bagging Communication Parameters

This file takes effect from version NXT 1.03.01

Fieldbus Output register			Fieldbus Input register					
Command number		Parameter	Value	Description	Register offset	Data Type	States	Comments
Set	Read						Bit number	
				General Faults	2	Integer (16 Bits)	0 = Emergency Stop	Binary Coded
							1 = Low Air Pressure	
							2 = Catch Gate Not Open	
							3 = System Error	
							4 = Discharge Door Not Closed	
							5 = Scale Exceeded Capacity	
							6 = Motor Failure	
				Blocking Faults	3	Integer (16 Bits)	0 = Underweight	Binary Coded
							1 = Overweight	
							2 = Discharge Too Long	
							Bit number	
				Stopping Faults	4	Integer(16 Bits)	0 = Stabilisation Too Long	Binary Coded
							1 = Zero Out Of Range	
							2 = Bag Not Detected	
							3 = Hopper Illogical Detection	
							4 = Hopper Low Level	
				Warning Faults	5	Integer (16 Bits)	0 = Low Battery	Binary Coded
							1 = Slow Cycle	
							2 = Bulk Blank Too Long	
							3 = Dribble Blank Too Long	
							4 = System Warning	
							Bit number	
				Live Weight	6 & 7	Float (32 Bits)	0 = In Service Mode	
							1 = Scale Overloaded	
							2 = Scale In Motion	
							3 = Scale Error	
							4 = Heart beat	

SpeedAC iQ Bagging Communication Parameters

This file takes effect from version NXT 1.03.01

Fieldbus Output register			Description	Fieldbus Input register		States	Comments
Command number	Parameter	Value		Register offset	Data Type		
Set	Read						
			Scale Status	8	Integer (16 Bits)	5 = Hopper State: 0 = Hopper Fill, 1 = Hopper Empty	
						6 = CheckWeight State: 0 = Release Weight, 1 = Check All Weight	
						7 = Algorithm in Auto-Tune Learning Mode	
						8 = Production Data Ready for update	
						9 = Handshake 0=Hanshake Reg. Is 0 1=Handshake Reg not 0	
						10 = Swap Bytes(Fieldbus) 0 = Bytes not Swapped 1= Bytes Swapped in Integer(Allen-Bradley)	
						11 = Free	
						12 = Free	
						13 = Free	
						14 = Free	
						15= Free	
			Active Weigh Program	9	Integer (16 Bits)		Number of weigh program
			Weigh Unit	10	Integer (16 Bits)	"kg" or "lb"	2 ASCII character string
			Free	11	Integer (16 Bits)		
			Command	12	Integer (16 Bits)	Requested Command "Echo" from PLC output word	
			Parameter	13	Integer (16 Bits)	Requested Parameter "Echo" from PLC output word	
Auto Page Data (Read)							
320	32		Command Status	14	Float (32Bits)	32	
			WP No	16	Float (32Bits)		Weigh Program Number
			Target Weight	18	Float (32Bits)		
			Average	20	Float (32Bits)		
			Standard Deviation	22	Float (32Bits)		1 sigma
			Last Checked	24	Float (32Bits)		
			Accepted Units	26	Float (32Bits)		
			Weighments/Unit done	28	Float (32Bits)		
			Weighments/Unit preset	30	Float (32Bits)		
			Units Done	32	Float (32Bits)		
			Batch Units	34	Float (32Bits)		
			Batch Preset	36	Float (32Bits)		
			Weighments/Min	38	Float (32Bits)		

SpeedAC iQ Bagging Communication Parameters

This file takes effect from version NXT 1.03.01

Fieldbus Output register			Description	Fieldbus Input register		States	Comments
Command number	Parameter	Value		Register offset	Data Type		
Set	Read						
			Bulk Time	40	Float (32Bits)		
			Dribble Time	42	Float (32Bits)		
			Cycle Time	44	Float (32Bits)		
Report Page (Read)							
320	40		Command Status	14	Float (32 Bits)	40	
			WP Nominal weight	16	Float (32 Bits)		
			Production Total Units Count	18	Float (32 Bits)		Unit Done
			Production Accepted Unit Count	20	Float (32 Bits)		
			Production Under Weight Count	22	Float (32 Bits)		
			Production Over Weight Count	24	Float (32 Bits)		
			Production Total Weight	26	Float (32 Bits)		
			Production Total Weighments LifeTime	28	Float (32 Bits)		Total Weighments
			Production Total Units LifeTime	30	Float (32 Bits)		Total Units
			Production Total Weight LifeTime	32	Float (32 Bits)		Total Weight
Batch Page (Read)							
320	50		Command Status	14	Float (32 Bits)	50	
			Batch Preset	16	Float (32 Bits)		
			Batch Units Done	18	Float (32 Bits)		
			Batch Units Accepted	20	Float (32 Bits)		
			Batch Under Weight Count	22	Float (32 Bits)		
			Batch Over Weight Count	24	Float (32 Bits)		
			Batch Total Weight	26	Float (32 Bits)		
			Batch Minimum Accepted	28	Float (32 Bits)		
			Batch Maximum Accepted	30	Float (32 Bits)		
			Batch residual	32	Float (32 Bits)		
			Batch Standard Deviation	34	Float (32 Bits)		
			Batch Average	36	Float (32 Bits)		
			Batch Count All	38	Float (32 Bits)	1 = Accepted include underweighments and overweighments	
Weigh Program Page 1 (Read)							
			Command Status	14	Float (32 Bits)	61	
			Nominal Weight	16	Float (32 Bits)		

SpeedAC iQ Bagging Communication Parameters

This file takes effect from version NXT 1.03.01

Fieldbus Output register				Fieldbus Input register				
Command number		Parameter	Value	Description	Register offset	Data Type	States	Comments
Set	Read							
320	61			Overfill	18	Float (32 Bits)		
				Dribble Cutoff	20	Float (32 Bits)		
				Bulk Cutoff	22	Float (32 Bits)		
				Dribble Feed Time	24	Float (32 Bits)		
				Bulk Feed Time	26	Float (32 Bits)		
				Underweight	28	Float (32 Bits)		
				Overweight	30	Float (32 Bits)		
				Intermediate Cutoff	32	Float (32 Bits)		
				Discharge Weight	34	Float (32 Bits)		
				Discharge Time	36	Float (32 Bits)		
				Falling Time	38	Float (32 Bits)		

Weigh Program Page 2 (Read)

						Value	
320	62			Command Status	14	Float (32 Bits)	62
				Minimum Feeding	16	Float (32 Bits)	
				Maximum Feeding	18	Float (32 Bits)	
				Reg. Min Feeding	20	Float (32 Bits)	
				Reg. Max Feeding	22	Float (32 Bits)	
				Stream Reg. Config.	24	Float (32 Bits)	0 = Low
							1 = High
							2 = Auto
				Actuator Position	26	Float (32 Bits)	
				Weighments / Unit	28	Float (32 Bits)	
				Feed Delay Time	30	Float (32 Bits)	
				Vibratory Discharge Doors	32	Float (32 Bits)	0 = OFF
							1 = ON
				Zeroing Config.	34	Float(32 Bits)	0 = Door closed
							1 = Door open
				Slow Cycle End	36	Float (32 Bits)	0 = Hold cycle
							1 = End cycle
							2 = Dribble feed

SpeedAC iQ Bagging Communication Parameters

This file takes effect from version NXT 1.03.01

Fieldbus Output register			Description	Fieldbus Input register		States	Comments
Command number	Parameter	Value		Register offset	Data Type		
Set	Read						
			Enabled Scale	38	Float (32 Bits)	0 = #1"	
						1 = #2"	
						2 = #1 & 2"	
Weigh Program Page 3 (Read)							
						Value	
						63	
						0 = kg	
						1 = lb	
						0 = Standard	
						1 = iQ-Smart	
						2 = iQ-Flash	
						3 = iQ-Slim	
						0 = Fastest	
						1 = Faster	
						2 = Balanced	
						3 = + Accurate	
						4 = ++ Accurate	
						0 = OFF	
						1 = ON	
						0 = By weight	
						1 = By Time	
			Catch Gate Delay	38	Float (32 Bits)		
Weigh Program Page 4 (Read)							
			Command Status	14	Float (32 Bits)	64	

SpeedAC iQ Bagging Communication Parameters

This file takes effect from version NXT 1.03.01

Fieldbus Output register			Description	Fieldbus Input register		States	Comments
Command number	Parameter	Value		Register offset	Data Type		
Set	Read						
320	64		Flexible Timer 1	16	Float (32 Bits)		
			Flexible Timer 2	18	Float (32 Bits)		
			Flexible Counter	20	Float (32 Bits)		
			Flexible Setpoint 1	22	Float (32 Bits)		
			Flexible Setpoint 2	24	Float (32 Bits)		
Machine Configuration Page 1 (Read)							
320	71		Command Status	14	Float (32 Bits)	71	
			Bulk Feed Blanking Time	16	Float (32 Bits)		
			Dribble Feed Blanking Time	18	Float (32 Bits)		
			Low Level Debounce Time	20	Float (32 Bits)		
			Hopper Refilling Time	22	Float (32 Bits)		
			Number of Weigh Programs	24	Float (32 Bits)		
			OIML Application	26	Float (32 Bits)	0 = No	
						1 = Yes	
			Feeder Type	28	Float (32 Bits)	0 = -----	
						1 = G	
						2 = GHS	
						3 = B	
						4 = GV	
						5 = V	
						6 = BHS	
						7 = BSF	
						8 = BSFHS	
						9 = SS	
						10 = DS	
			Number of Scale	30	Float (32 Bits)		
			Config. Bag Holder	32	Float (32 Bits)	0 = No	
						1 = S4	
						2 = Bird Beak	
			Language #1	34		1 = English	Default

SpeedAC iQ Bagging Communication Parameters

This file takes effect from version NXT 1.03.01

Fieldbus Output register			Fieldbus Input register					
Command number		Parameter	Value	Description	Register offset	Data Type	States	Comments
Set	Read							
				Language #2	36	Float (32 Bits)	1 = English	
				Language #3	38		2 = Arabic	
							3 = Chinese	
							4 = Czech	
							5 = Danish	
							6 = Dutch	
							7 = French	
							8 = German	
							9 = Hungarian	
							10 = Italian	
							11 = Polish	
							12 = Portuguese	
							13 = Romanian	
							14 = Russian	
							15 = Slovak	
							16 = Spanish	
							17 = Thai	
							18 = Turkish	

Machine Configuration Page 2 (Read)

						Value	
320	72		Command Status	14	Float (32 Bits)	72	
			Com2	16	Float (32 Bits)	0 = None	Production Report Port
						1 = Cont. Out	Continuous Output
						2 = Unit Rec. String	Unit Record String
						3 = Report to Printer	
			USB	18	Float (32 Bits)	0 = None	Production Report Port
						1 = Unit Rec. String	
						2 = Unit Rec. File	Unit Record File
						3 = Report to Printer	
			Auto Save Correction	20	Float (32 Bits)	0 = No	
						1 = Yes	

SpeedAC iQ Bagging Communication Parameters

This file takes effect from version NXT 1.03.01

Fieldbus Output register			Description	Fieldbus Input register		States	Comments
Command number	Parameter	Value		Register offset	Data Type		
Set	Read						
			Discharge Req. Debouncing	22	Float (32 Bits)		Discharge Request Debouncing
			Ethernet	24	Float (32 Bits)	0 = None	Production Report Port
						1 = Cont. Out	
						2 = Unit Rec. String	
						3 = Report to Printer	
			Disch. On Door Sensor	26	Float (32 Bits)	0 = No	Discharge On Door Sensor
			1 = Yes				
			Dribble Out on Bulk	28	Float (32 Bits)	0 = OFF	
			1 = ON				
Machine Configuration Page 3 (Read)							
		73	Command Status	14	Float (32 Bits)	73	
			Operator Password	16	Float (32 Bits)		
			Supervisor Password	18	Float (32 Bits)		
			Operator Logout Delay	20	Float (32 Bits)		
			Supervisor Logout Delay	22	Float (32 Bits)		
			PT Logout Delay	24	Float (32 Bits)		
Machine Parameters Page 1 (Read)							
		81	Command Status	14	Float (32 Bits)	81	
			Sample Frequency	16	Float (32 Bits)		
			Sample Size	18	Float (32 Bits)		
			Zero Frequency	20	Float (32 Bits)		
			Zero Limit	22	Float (32 Bits)		
			Disable Auto Zero	24	Float (32 Bits)	0 = OFF	
			1 = ON				
			Screen Saver Time	26	Float (32 Bits)		
			Discharge Doors Max Time	28	Float (32 Bits)		
			Slow Cycle Time	30	Float (32 Bits)		
			Catch Gate Max Time	32	Float (32 Bits)		
			Out of Tolerance Time	34	Float (32 Bits)		

SpeedAC iQ Bagging Communication Parameters

This file takes effect from version NXT 1.03.01

Fieldbus Output register			Fieldbus Input register					
Command number		Parameter	Value	Description	Register offset	Data Type	States	Comments
Set	Read							
				Bag Detection Time	36	Float (32 Bits)		
				Stabilisation Time Limit	38	Float (32 Bits)		
Machine Parameters Page 2 (Read)								
							Value	
320	82			Command Status	14	Float (32 Bits)	82	
				Correction on Average	16	Float (32 Bits)	0 = OFF 1 = ON	
				Cutoff Correction Limit	18	Float (32 Bits)		
				Bulk Cutoff Correction	20	Float (32 Bits)		
				Cutoff Correction	22	Float (32 Bits)		
				Smart Slow Filter Size	24	Float (32 Bits)		
				Smart Fast Filter Size	26	Float (32 Bits)		
				Flash Filter Size	28	Float (32 Bits)		
				Standard Filter Size	30	Float (32 Bits)		
				Smart Stabilisation Window	32	Float (32 Bits)		
Machine Parameters Page 3 (Read)								
						Value		
320	83			Command Status	14	Float (32 Bits)	83	
				Flexible Timer 1	16	Float (32 Bits)		
				Flexible Timer 2	18	Float (32 Bits)		
				Flexible Counter	20	Float (32 Bits)		
				Flexible Setpoint 1	22	Float (32 Bits)		
				Flexible Setpoint 2	24	Float (32 Bits)		
Strings info (Read)								
				String Length	14	Float (32 Bits)	Lenght of Returned String	9 for example below
						Value # (Desired String)	Ex. of WP name: "25KG Rice"	
	320	99	Value #	Character 1 & 2	16	Integer(16Bits)	1 = WP Name	"25"
				Character 3 & 4	17	Integer(16Bits)	2 = Batch Name	"KG"
				Character 5 & 6	18	Integer(16Bits)	3 = Batch Details	" R "
				Character 7 & 8	19	Integer(16Bits)	4 = Plant Line Name	"ic"
				Character 9 & 10	20	Integer(16Bits)	5 = Serial Number	"e"

SpeedAC iQ Bagging Communication Parameters

This file takes effect from version NXT 1.03.01

Fieldbus Output register			Description	Fieldbus Input register		States	Comments
Command number	Parameter	Value		Register offset	Data Type		
Set	Read						
			Character 11 & 12	21	Integer(16Bits)	6 = Customer Name	""
			Character 13 & 14	22	Integer(16Bits)	7 = Customer Location	""
			Character 15 & 16	23	Integer(16Bits)	8 = Support Phone Number	""
			Character 17 & 18	24	Integer(16Bits)	9 = Support Fax Number	""
			Character 19 & 20	25	Integer(16Bits)	10 = Support Phone Email	""
			Character 21 & 22	26	Integer(16Bits)	11 = Parts Phone Number	""
			Character 23 & 24	27	Integer(16Bits)	12 = Parts Fax Number	""
			Character 25 & 26	28	Integer(16Bits)	13 = Parts Phone Email	""
			Character 27 & 28	29	Integer(16Bits)	14 = Language 1 Text	""
			Character 29 & 30	30	Integer(16Bits)	15 = Language 2 Text	""
			Integer(16Bits)	16 = Language 3 Text	""
			Character 93 & 94	62	Integer(16Bits)	17 = Printer IP Adress	""
			Character 95 & 96	63	Integer(16Bits)	18 = Unit Record String	""

INPUT AND OUTPUT DESCRIPTIONS

SPEEDAC IQ

INPUTS	
Name	Description
Emergency stop	Emergency stop signal: If configured, signal must be ON for operation. If input goes OFF, it generates a general fault.
Discharge request	Discharge request signal: This signal must be configured. It must go ON when bagger or manual spout is ready to receive weighment. It must go back OFF between weighments, except in iQ Sim mode.
Discharge door close	This signal is used to confirm that the weigh pan is closed. If configured, it is only used to confirm that the doors are opening at every cycle. The Machine parameter Discharge doors maximum time must be adjusted accordingly.
Catch gate open	This signal is used to confirm that the catch gate is open. If configured, it is only used to confirm that the gate is fully opening at every cycle. The Machine parameter Catch gate maximum time must be adjusted accordingly.
High level sensor	This signal is used to manage the hopper refilling. It is fail-safe, so when product is detected, the signal must be OFF to avoid overfilling if sensor cable is broken. If configured, when the signal goes ON, the timer in Machine parameter Hopper refilling time will start. The output Hopper refill request will turn ON after the timer is done or low level is reached. The output Hopper refill request will turn OFF as soon as the high level sensor turns OFF.
Stop	If configured, when it goes ON, the weigher will begin the stopping process, in order to stop with the weighing pan empty. This is the same function as the Stop button in Auto screen.
Empty hopper	If configured, the Empty hopper/Fill hopper memory will be toggled each time the signal of this input comes ON.
Pressure switch	Pressure switch signal: If configured, signal must be ON for operation. If input goes OFF, it generates a general fault.
Motor failure	Motor failure signal: If configured, signal must be ON for operation. If input goes OFF, it generates a general fault.
Low level sensor	This signal is mandatory. It needs to be ON for normal operation. It ensures an adequate amount of product to reach the performances. This signal can be bypassed using the Empty hopper/Full hopper in emptying mode. In this mode, the speed and precision of the weigher cannot be guaranteed.
Start	If configured, when it goes ON, the weigher will begin the starting process. This is the same function as the Start button in Auto screen.
Manual discharge	If configured, this signal can be used to request a manual discharge of the weighment in case product is present in weigh pan prior to start the system in Auto mode.
Dribble feed only	If configured, this signal can be used to request a weighment to be performed in dribble feed only. Applicable only in Standard feed mode.

INPUT AND OUTPUT DESCRIPTIONS

SPEEDAC IQ

OK for bulk feed	If configured, this signal can be used to start the bulk feed only when input is ON. Applicable only in Standard feed mode.
OK for interm. feed	If configured, this signal can be used to start the intermediate feed only when input is ON. Applicable only in Standard feed mode.
OK for dribble feed	If configured, this signal can be used to start the dribble feed only when input is ON. Applicable only in Standard feed mode.
Empty bag ready	If configured, this input is used to detect the empty bag when using a manual spout.
Clear faults	If configured, this input is used to clear the faults and to acknowledge underweight and overweight weighments.
Bag detected at kicker	Mandatory to be configured if using output Activate kicker . If the weigher is in Auto mode, when this input turns ON, the Weigh program parameter Kicker centering time will start, and activate the ouput when done.
Kicker retracted	If configured, this signal will be used to ensure that the bag kicker is fully retracted every time the weigher is restarted. It can also be used, to stop the bag kicker, if using a rotating movement to activate the kicker. In this case, the Weigh program parameter Kicker activation time must be set to 0.
Test weights request	If configured, if weigher is in OFF mode, this input is used to turn ON and OFF the output Lower test weight .
Reset out of tol. alarm	If configured, it is used to acknowledge underweight or overweight alarm.
Change WP IN1	If configured, inputs change WP IN1 to IN4 are used together, in a BCD format, to request a Weigh program change from 1 to 15.
Change WP IN2	If configured, inputs change WP IN1 to IN4 are used together, in a BCD format, to request a Weigh program change from 1 to 15.
Change WP IN3	If configured, inputs change WP IN1 to IN4 are used together, in a BCD format, to request a Weigh program change from 1 to 15.
Change WP IN4	If configured, inputs change WP IN1 to IN4 are used together, in a BCD format, to request a Weigh program change from 1 to 15.
Flex input #1	If configured, this input can be used to build an optional logic thru Flex IOs feature.
Flex input #2	If configured, this input can be used to build an optional logic thru Flex IOs feature.
Hold cycle	If configured, this input will force the feeding cycle to pause. Only used in Standard feed mode.

INPUT AND OUTPUT DESCRIPTIONS

SPEEDAC IQ

OUPUTS	
Name	Description
Fault	If configured, this output will turn ON whenever there is a fault of any type. This is the ONLY output that can be ON in OFF mode.
Catch gate	If configured, this output will be ON all the time during the feeding process. It is also possible to leave it ON between weighments by setting the Weigh program parameter Catch gate delay to 5 sec.
Vibratory disch. door	If configured, this output will turn ON while the discharge doors are requested to open.
Intermediate feed	If configured, this output will turn ON in bulk in Machine configuration parameter Dribble out ON in bulk is ON. It will turn ON in intermediate feed otherwise. It will be switched OFF by Weigh program parameter Intermediate cutoff . Use only in Standard feed mode AND if NOT using Analog output.
Discharge	If configured, it turns ON when discharge doors turn ON, on every weighment if Weigh program parameter Weighments/unit is 1 or on the last weighment of the unit.
Stream regulator	If configured, it is used as set in the Weigh program parameter Stream Regulator Configuration , always Low (OFF), always High (ON) or following the bulk (high) and dribble (low) if parameter is Auto .
Discharge door	Mandatory. Turns ON to discharge weighment when ready and discharge is requested. It will stay ON for the Discharge time and then wait for the weight to be lower than the Discharge weight (if not equal to Nominal weight).
Bulk feed	Mandatory for all weigher type except "V" and "GHS" feeders. Active in the bulk phase of the feeding cycle.
Dribble feed	Mandatory. Turns ON in the dribble feed of the feeding cycle.
Hopper fill request	See inputs Bag detected at kicker and Kicker retracted for details.
Discharge ready	If configured, it turns ON when the feeding cycle is done (for non-verified weighment) or when weighment is verified (and accepted if out of tolerance).
Low level	If configured, it turns ON if the feed hopper is in low level.
Out of tolerance	If configured, it turns ON if the weigher has detected an underweight or overweight weighment.
Overweight alarm	If configured, it turns ON if the weigher has detected an overweight weighment.
Underweight alarm	If configured, it turns ON if the weigher has detected an underweight weighment.

INPUT AND OUTPUT DESCRIPTIONS

SPEEDAC IQ

Cycle in progress	If configured, it turns ON if the weigher is in Auto mode.
External bag counter	If configured, it turns ON every unit. It stays ON as long as the discharge doors are open.
Cycle in hold	If configured, it turns ON if the cycle is in hold, either because the feeding cycle is too long or it has been requested by the relevant input. Only used in Standard feed mode.
Catch gate dribble	If configured, this input will turn ON at the bulk phase and turn OFF when the Intermediate cutoff is reached. Only used in Standard feed mode.
Bag holder	If configured, it will turn ON when discharge request turns ON and will turn OFF after the Falling time . Only used when manual spout is present.
Inflate bag	If configured, it will turn ON after the bag holder turns ON, and will stay ON for the Weigh program parameter Bag inflation time . Only used when manual spout is present.
Bag release	If configured, it turns ON after the Weigh program parameter Falling time is done and will turn OFF when Discharge Request goes OFF.
Knock hammer	If configured, it turns ON when the discharge doors open and will cycle ON/OFF until doors are closing. The ON and OFF time is the Weigh program parameter Knocking time .
Activate kicker	See Bag detected at kicker and Kicker retracted inputs for details.
Lower test weight	See input Test weights request for details.
Extend actuator	If configured, Extend actuator and Retract actuator inputs will work together, in Prep mode, to position the actuator according to Weigh program parameter Actuator position . The feedback is an analog value that must be connected to an ADE on the MAI module and configured on the Ain1 in the service mode.
Retract actuator	See output Extend actuator for details.
Flex output #1	If configured, custom setup can be programmed in Flex iQ pages.
Flex output #2	If configured, custom setup can be programmed in Flex iQ pages.
Flex output #3	If configured, custom setup can be programmed in Flex iQ pages (Counter function).
WP Number OUT1	If configured, Weigh program number OUT1-OUT4 will reflect, in BCD, the Weigh program number from 1 to 15. Only works if in Auto .
WP Number OUT2	If configured, Weigh program number OUT1-OUT4 will reflect, in BCD, the Weigh program number from 1 to 15. Only works if in Auto .
WP Number OUT3	If configured, Weigh program number OUT1-OUT4 will reflect, in BCD, the Weigh program number from 1 to 15. Only works if in Auto .

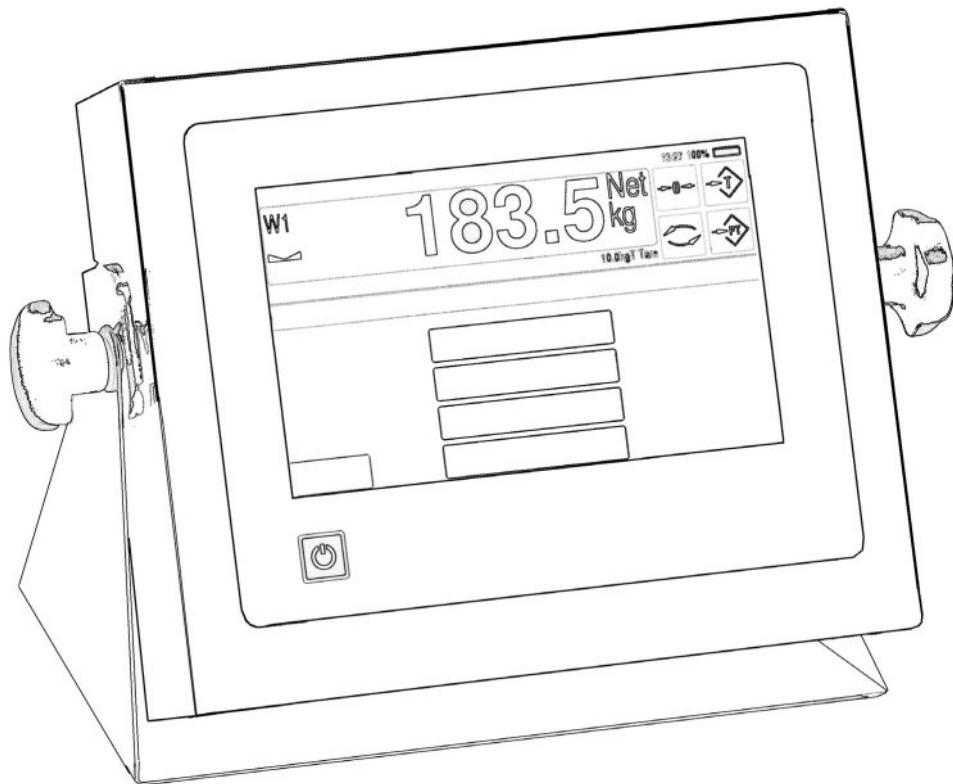
INPUT AND OUTPUT DESCRIPTIONS

SPEEDAC IQ

WP Number OUT4	If configured, Weigh program number OUT1-OUT4 will reflect, in BCD, the Weigh program number from 1 to 15. Only works if in Auto .
Closing conveyor	If configured, output will be turned ON when weigher is in Auto mode.

Technical Manual

IT8000ET



Industrial Weighing Terminal
With Touch Screen

February 2017

ST.2309.1472

Rev. 14

Technical Manual IT8000ET

Date: February 08, 2017
File: IT8000ET_THE.DOC
Program Version: as of firmware 'V4_I6_20170110.IT468E'

**This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) this device may not cause harmful interference, and (2) this device must accept any interference
received, including interference that may cause undesired operation.**

Published By:

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

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1 Introduction

IT8000ET 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 IT8000ET 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
- Flintec / HBM Calibration Manual, order No.: ST.2309.1568
- MultiRange Calibration Manual, order No.: ST.2309.0057
- WLX Installation Instructions, order No.: ST.2309.1590
- Web Interface Operation Manual, order No.: ST.2309.1692
- PC ScaleView Operation Manual, order No.: ST.2309.1816

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.

Compliance with the following safety instruction is mandatory for UL approved units:

! **CAUTION**

- For power supply of the IT8000ET-DC use LPS and/or NEC class 2 power supply units only.

Note:

- 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 Précautions d'emploi (ETL)



A V E R T I S S E M E N T

Retirez la fiche de réseau avant d'ouvrir l'appareil ou coupez le courant du terminal – Danger de mort !



A V E R T I S S E M E N T

Attention en actionnant les touches de commande des dispositifs de transport, trappe etc.
Avant d'actionner ces touches vérifiez que personne ne se trouve dans le périmètre d'action du mouvement.



A V E R T I S S E M E N T

L'IT8000ET ne pourra pas être utilisé dans un environnement comportant un danger d'explosion. La classification correspondante est en tout cas l'obligation de l'utilisateur (division en catégories : zones, groupes d'explosion, catégories de température etc.). Adressez-vous à ce sujet aux autorités d'inspection locales et aux organismes de contrôle des normes de sécurité.



A V E R T I S S E M E N T

La structure du système doit être contrôlée par des experts qualifiés qui connaissent la construction et la fonction de tous les éléments connectés, si l'appareil fait partie d'un système global !



A V E R T I S S E M E N T

Pour l'installation, les travaux de maintenance et pendant l'utilisation, tenez compte des directives du VDE (association des électriciens allemands) et des consignes locales de sécurité et de prévention des accidents !



A V E R T I S S E M E N T

Le bloc d'alimentation fournit du côté sortie des tensions SELV (très basse tension de sécurité). En cas de raccordement de composants externes (interfaces sérielles, sorties parallèles), assurez-vous qu'il n'y a que des tensions SELV.



ATTENTION

• La tension du réseau local doit correspondre à la tension d'entrée de l'appareil !



ATTENTION

• Cet appareil et ses périphériques ne doivent être installés, ajustés et entretenus que par un personnel qualifié.



ATTENTION

• La prise doit se trouver à proximité immédiate de l'appareil et son accès doit être facile, si l'on relie le terminal de pesage par un câble de réseau avec une fiche. Prévoir un dispositif de séparation facilement accessible au circuit d'alimentation, si la connexion est fixe.



ATTENTION

• L'appareil utilise la protection contre les courts-circuits / dispositif de protection contre les surintensités des bâtiments installés sur site.

1.4 Declaration Of Conformity (US)

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



The non-automatic weighing instrument, type	IT8000ET-AC IT8000ET-DC
Manufacturer	SysTec GmbH
No. of NTEP type-approval certificate	NTEP CC No. 08-006 III / III L



3162737

Conforms to UL STD 60950-1

Certified to CAN/CSA STD C22.2 No. 60950-1

Conforms to the requirements of the following standards and specifications:

NIST Handbook 44, 2007 Edition, NCWM Publication 14, 2007 Edition

FCC 47 CFR Ch. 1 Part 15 2007-09-20

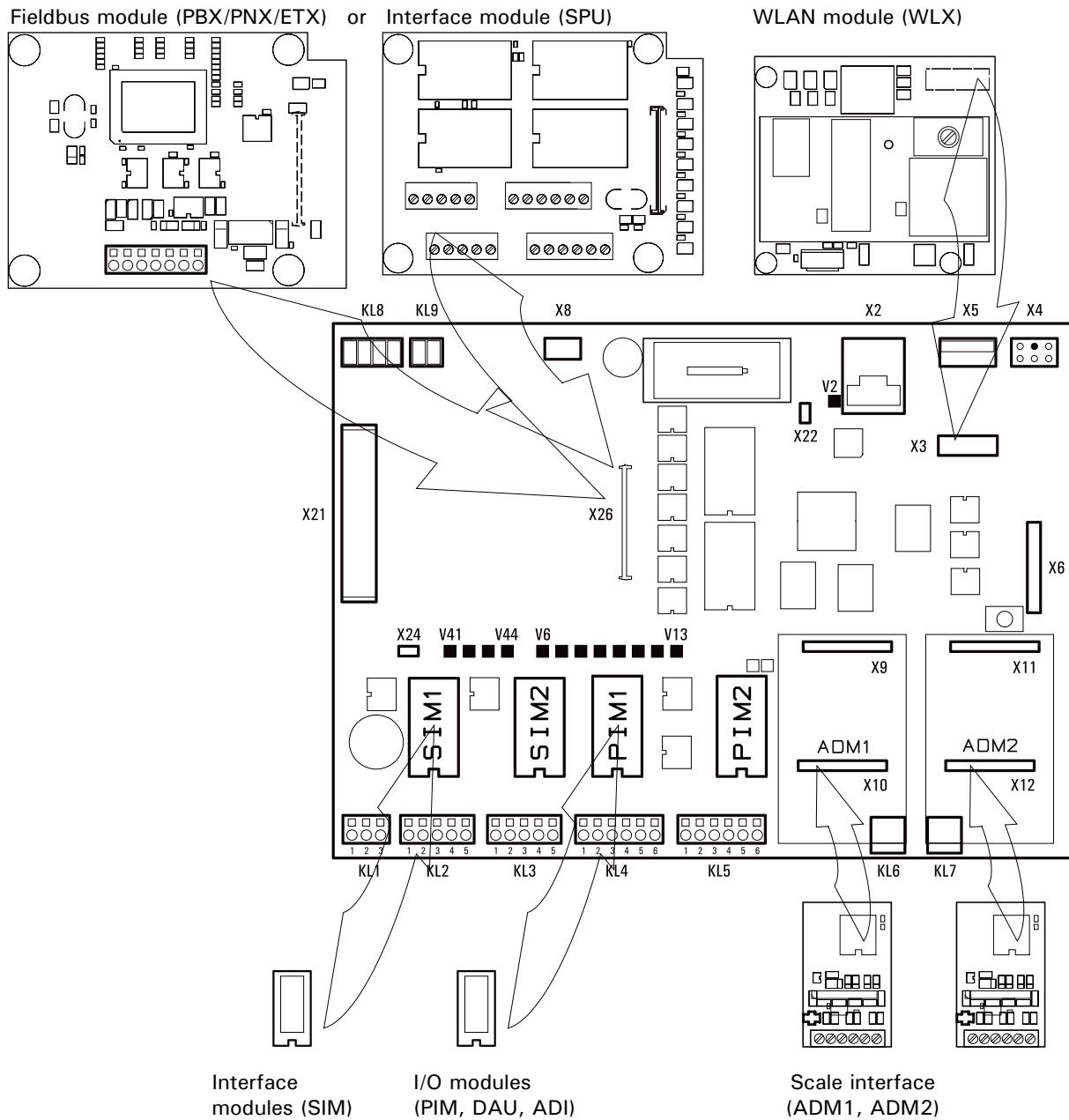
Section 15.107 (a), limits same as IEC/CISPR 22:1997 (EN 55022:1998) Class B

Section 15.109 (a) Class B, and/or

Section 15.109 (g), i.e. IEC/CISPR 22:1997 (EN 55022:1998) Class B

2 System Description

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



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	3.3 V CPU logic
V42	5V	5 V peripherals
V41	12V	12 V peripherals
Ethernet interface:		
V2	LAN	Traffic / connected
ADM scale modules:		
V43	ANA:5V	5 V for ADM

PIM logic side active:		
V10	INO	PIM1 input #1
V11	IN1	PIM1 input #2
V6	OUT0	PIM1 output #1
V7	OUT1	PIM1 output #2
V12	IN2	PIM2 input #1
V13	IN3	PIM2 input #2
V8	OUT2	PIM2 output #1
V9	OUT3	PIM2 output #2

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.

Compliance with the following safety instructions is mandatory for UL approved units:



CAUTION

- For power supply of the IT8000ET-DC use LPS and/or NEC class 2 power supply units only.



CAUTION

- Use UL-approved cables only for connections to the weighing terminal.

- Only suitable cables may be connected to the 24 V power supply unit, complying with the specification below:
 - $U_N > 30 \text{ V}$;
 - suitable for the environmental conditions prevailing at site of installation (indoor / outdoor / temperature / humidity);
 - UL approval (e.g. category AVLV2, QPTZ or DUZX);
 - gauge $26 < \text{AWG} < 16$;
 - diameter of cable $4 \text{ mm} < d < 8 \text{ mm}$.

3.2 Setup Of The Instrument

Ambient temperature for operating the unit may range from $-10 \text{ }^{\circ}\text{C}$ to $+40 \text{ }^{\circ}\text{C}$, 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.

3.2.1 Securing Unit For Wall-Mount Installation

Compliance with the following safety instructions is mandatory for UL approved units:

In order to comply with UL guidelines, the components must only be secured with the fixing materials described below. The positions of the fixing holes for the device are shown in the section 'Dimensions'.

Fixing to metal:

Type	Screw type ¹⁾
A	M6 x 12
	Note ¹⁾ represents min. length

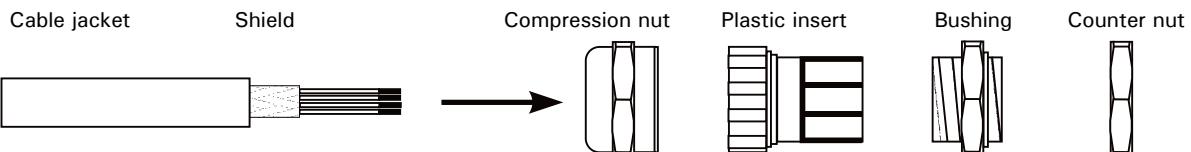
Fixing to reinforced concrete:

Type	Screw type ¹⁾	Plug type (Nylon)
A	6 x 40 mm	8 mm, e.g. Fischer S8, type No.: 50108
	Note ¹⁾ represents min. length	

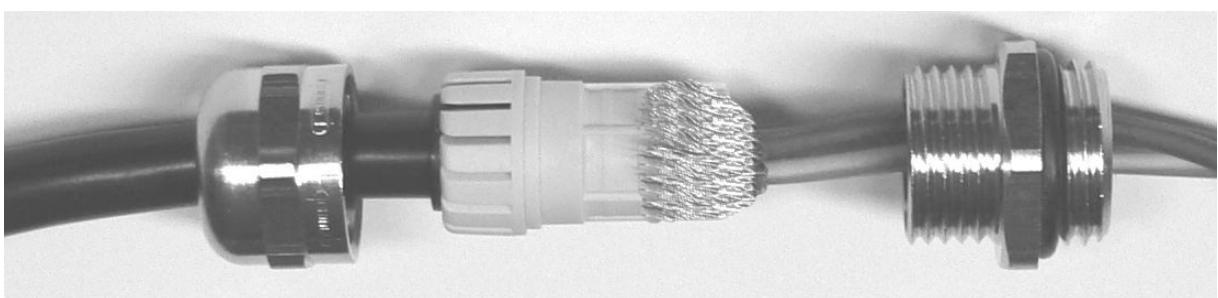
Ensure that the wall or ceiling can hold four times the total weight of the device.

3.3 Connection Of Cables

All cables are led into the housing 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 to ensure good conductive contact with housing. Cut wires of shield to length of comb, avoid protruding wires that would endanger tightness of cable gland;



4. Insert retainer with cable into bushing;
5. Screw compression nut onto bushing and use wrench to tighten securely.



WARNING

Cut cable ends as short as possible and make sure that they cannot touch any parts conducting mains voltage (mains cable, power supply unit)!

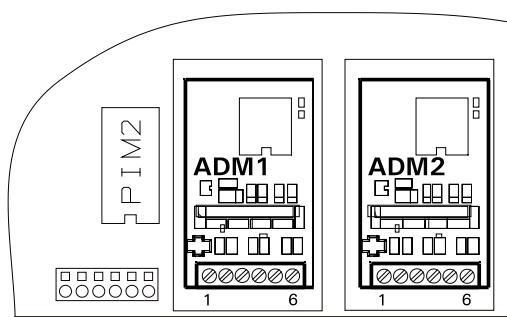
Use wire end ferrules with plastic collar on stranded cables and avoid protruding wires!

3.4 Connection Overview

3.4.1 ADM

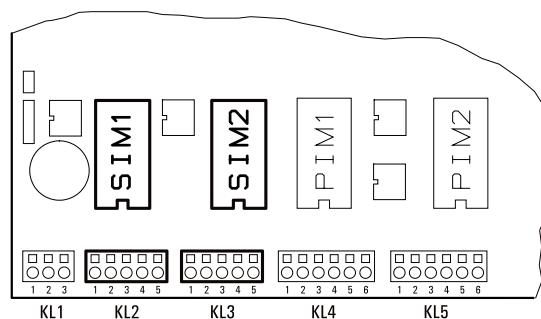
6-wire	
1	+ Excitation
2	- Excitation
3	+ Sense
4	- Sense
5	+ Signal
6	- Signal

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

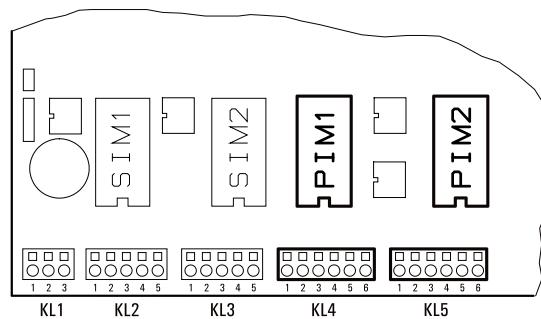


3.4.2 CPU

KL2 Serial interface 1 (COM1) KL3 Serial interface 2 (COM2)			
Terminal#	RS232	20 mA	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: digital inputs and outputs 0–3			
KL4	KL5		
1		0V	
2		+ 12V	for external switches only!
3		INO	
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 0/4–20 mA	KL4.3	KL4.5
I -	- Current output 0/4–20 mA	KL4.4	KL4.6
U +	+ Voltage output 0/2–10 V	KL5.2	KL5.4
U -	- Voltage output 0/2–10 V	KL5.3	KL5.5

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

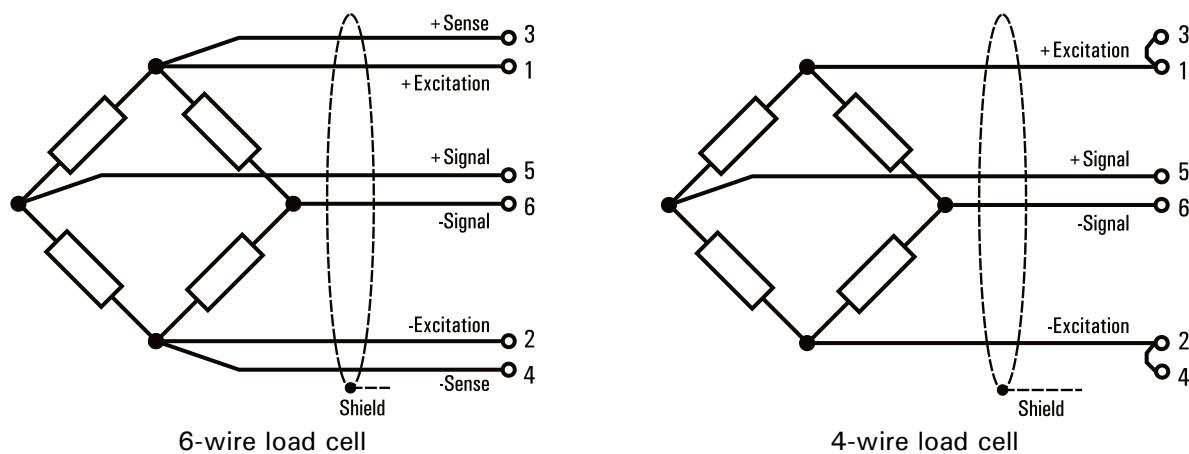
3.5 Connection Of Scales

3.5.1 Connection Of Analog Scale To ADM

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

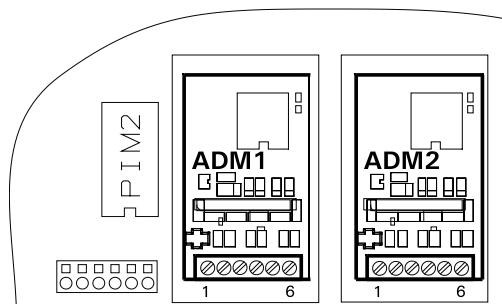
- Max. 8 strain gauge load cells 350Ω each
- Overall impedance $43 \Omega \dots 4500 \Omega$
- W&M approved resolution of 6,000 e at a max. preload of 80 %, internal resolution 524,000 d
- Smallest permissible input signal for approved applications: $0.33 \mu\text{V} / \text{e}$
- Update rate 50–400 updates / second (selectable in Service Mode)
- Load cell excitation: $5 \text{ V} \pm 5 \%$ (gated power supply).

Principal schematics of 6-wire and 4-wire strain gauge load cell:



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

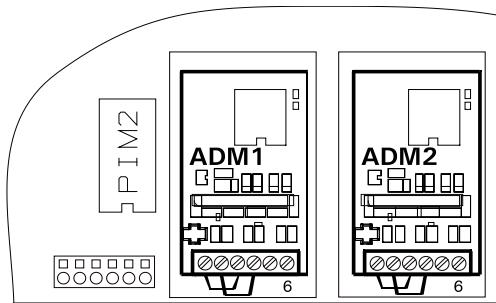
Terminal Assignment	
1	+ Excitation
2	- Excitation
3	+ Sense
4	- Sense
5	+ Signal
6	- Signal



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

To connect load cells 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

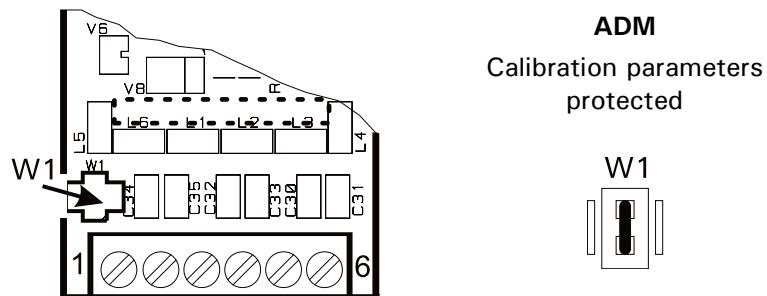


For the installation of connection cables for analog weighing platforms please follow the recommendations listed below:

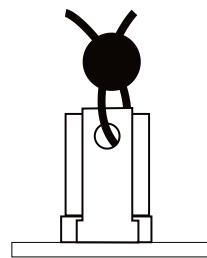
- Only use suitable load cell cable:
(e.g. SysTec order No. 10KAB214, $3 \times 2 \times 0.75 \text{ mm}^2$, shielded, max. 200 m)
 - Nominal voltage of cable $\geq 250 \text{ V}$
 - Shielded cable (shielding braid)
 - Length and cross section of the individual wires must comply with the following condition:
 $\text{Cable length (m)} / \text{Cross section (mm}^2\text{)} \leq 270 \text{ (m/mm}^2\text{)}$
 - Maximum length of connection cable between weighing platform and weighing terminal: 200 m
- Unsuitable load cell cables may affect accuracy.
- The shield of the load cell 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 load cell 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. Load cells 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. 16 mm 2) in parallel to the load cell cable.
- Distance between load cell cables and power lines: $\geq 0.5 \text{ m}$. Install load cell cables in grounded metal conduits, metal hoses or metal cable trays.
- If tension load is applied to load cells instead of compression load, connection for + Signal and - Signal must be transposed.

3.5.2 Sealing Of Calibration Parameters

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



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



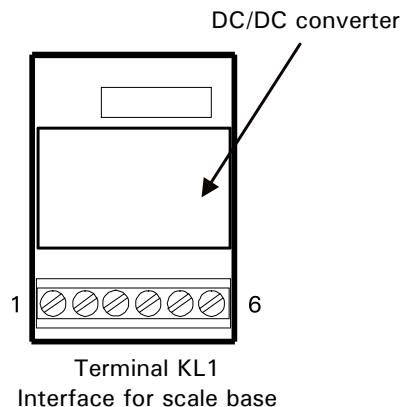
3.5.3 Connection Of Digital Mettler-Toledo Scale Bases With IDNet Interface

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

One or two **IDN** modules may be installed. If only one **IDN** is used, the remaining socket **ADM2** can then be used for an additional **ADM** board to connect a scale base with up to 8 analog load cells (350 Ω each). If an **IDN** module is installed in socket **ADM2**, the serial interface **SIM2** must not be used!

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

IDN interface module



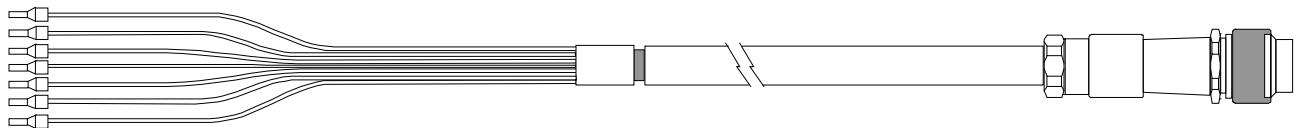
Terminal KL1	Signal	Function
1	TxD—	— transmit line 20 mA CL
2	TxD+	+ transmit line 20 mA CL
3	RxD—	— receive line 20 mA CL
4	RxD+	+ receive line 20 mA CL
5	0 V	0 V supply voltage
6	+ 12 V (150 mA)	+ 12 V supply voltage

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

For **IDNet** scale bases with 12 V and 32 V 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. 0.3 m):

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



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

Note:

The blue wire of cable 16KAB002 (for IDNet scale bases with 12 V 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 12 V and 32 V supply) are fitted with crimp contacts for connection to the IDNet-PSBox.

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

The **DWB module** (Digital Weighing Board) permits the connection of one digital force transducer operating on 12 VDC power supply and communicating with the weighing terminal via RS485 2-wire or 4-wire network.

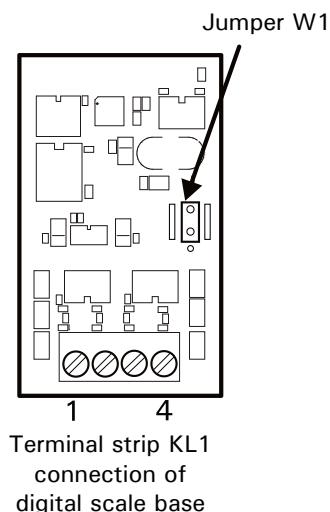
At present, scale bases and load cells are supported as follows:

- Sartorius series IS weighing platforms
- HBM series C16i load cells
- Flintec series RC3D load cells

Calibration data are stored power-fail-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 DWB is used, the remaining socket ADM2 can then be used for an additional ADM board to connect a scale base with up to 8 analog load cells (350 Ω each).

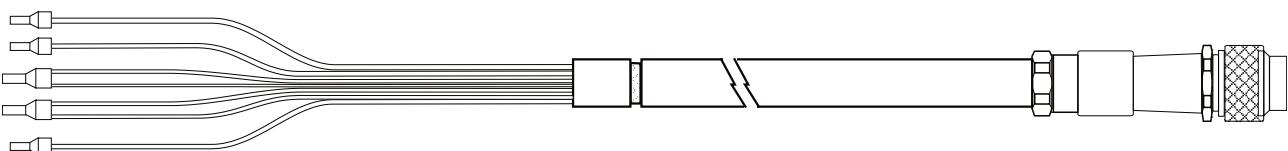
DWB interface module



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. 0.3 m):

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



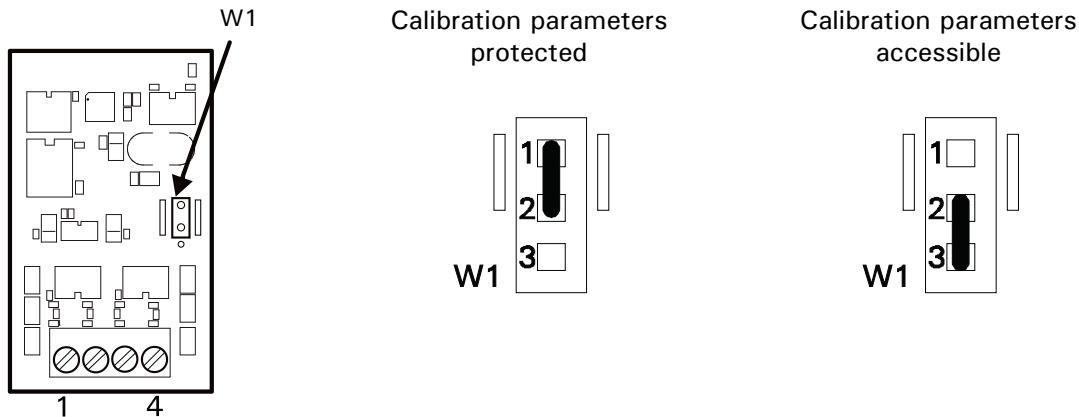
Terminal KL1 (DWB)	Color	Signal	Pin assignment (12-pin Amphenol connector)
1	green	Tx + / Rx +	L
2	yellow	Tx - / Rx -	A
-	blue *	PROG	F

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

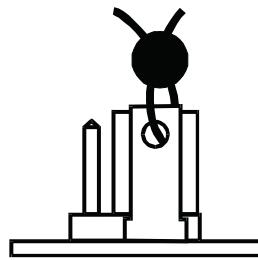
*) Note: The blue wire (PROG) is not used and should be cut directly at the cable gland.

3.5.5 Sealing Of Calibration Parameters

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



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



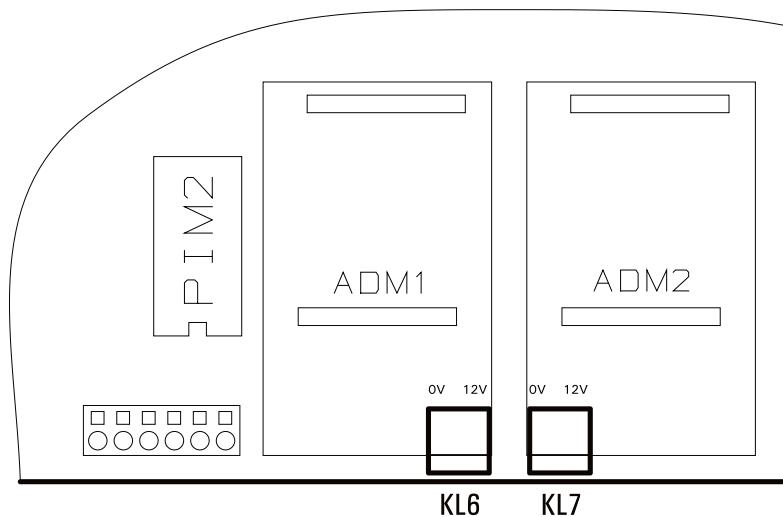
3.5.6 Connection Cables For Digital Force Transducers

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 ≥ 250 V.
- 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: ≥ 0.5 m. Install data cables in grounded metal conduits, metal hoses or metal cable trays.
- Maximum length of connection cable between weighing platform and terminal: 15 m.

3.5.7 Auxiliary Power Supply For Digital Force Transducers

An auxiliary power supply of 12 VDC for digital force transducers is available at terminals KL6 and KL7.



Assignment terminal strips KL6 and KL7

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

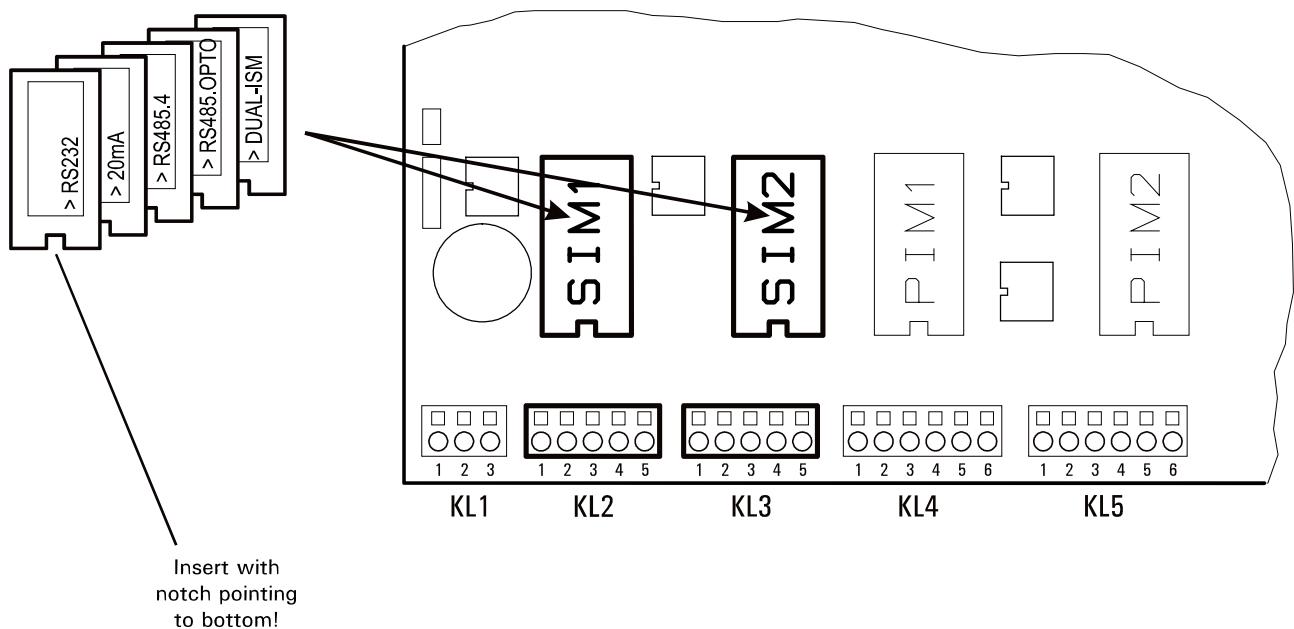
3.6 Connection Of Serial Interfaces (SIM And DUAL-ISM)

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' 20 mA current loop interface
- 'SIM RS485.4' RS485/422 4-wire interface
- 'SIM RS485.OPTO' RS485 4-wire optoisolated interface
- 'DUAL-ISM' to connect dual-channel pulse wheel
- SPU only: 'SIM RS485.2' RS485 2-wire interface

Please note: When a 20 mA 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:

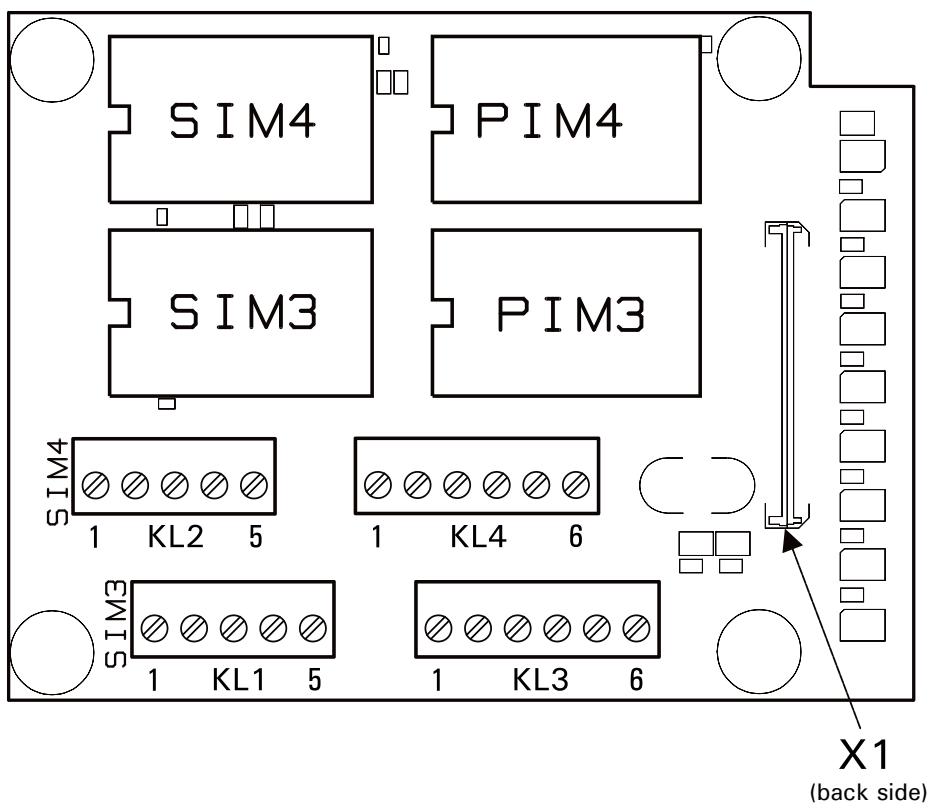


Terminal assignment:

Serial interface 1 (COM1): KL2 Serial interface 2 (COM2): KL3			
Terminal#	RS232	20 mA	RS485 4-wire
1	TxD	TX _{IN}	Tx A (Tx +)
2	RTS (COM1 only)	TX _{OUT}	Tx B (Tx -)
3	RxD	RX _{IN}	Rx A (Rx +)
4	CTS (COM1 only)	RX _{OUT}	Rx B (Rx -)
5	Gnd	—	—

With SPU interface expansion module additional serial interfaces can be connected. The sockets SIM3–SIM4 provide connection for up to 2 SIM modules.

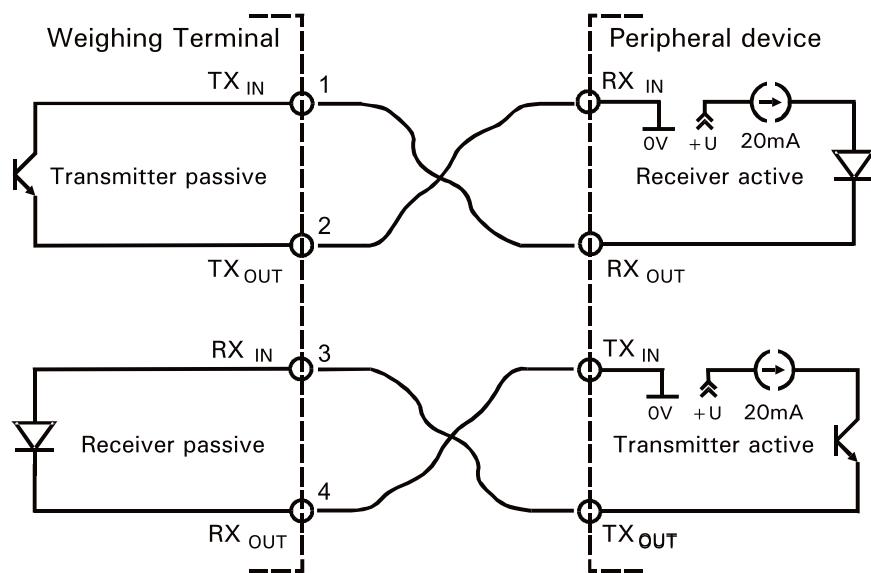
Connections on SBU board



Connector SPU	Socket mainboard
X1	X26

Serial interfaces					
SIM3 (COM3)	SIM4 (COM4)	RS232	20 mA	RS485 4-wire	RS485 2-wire
KL1.1	KL2.1	TxD	TX _{IN}	Tx A (Tx +)	A (Tx + / Rx +)
KL1.2	KL2.2	RTS	TX _{OUT}	Tx B (Tx -)	B (Tx - / Rx -)
KL1.3	KL2.3	RxD	RX _{IN}	Rx A (Rx +)	—
KL1.4	KL2.4	CTS	RX _{OUT}	Rx B (Rx -)	—
KL1.5	KL2.5	Gnd	—	—	—

Principal circuit diagram of the 20 mA 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 0.14 mm² or LIYCY 3 x 2 x 0.25 mm², shield grounded on both sides.

Resistance	$\leq 125 \Omega/\text{km}$
Gauge	$\geq 0.14 \text{ mm}^2$ up to 200 m, $\geq 0.25 \text{ mm}^2$ up to 1200 m
Capacitance	$\leq 130 \text{ nF/km}$
Length RS232	max. 15 m
Length RS485	max. 1200 m
Impedance RS485	approx. 150 Ω
Nominal voltage	$\geq 250 \text{ V}$

For RS485 connections please note:

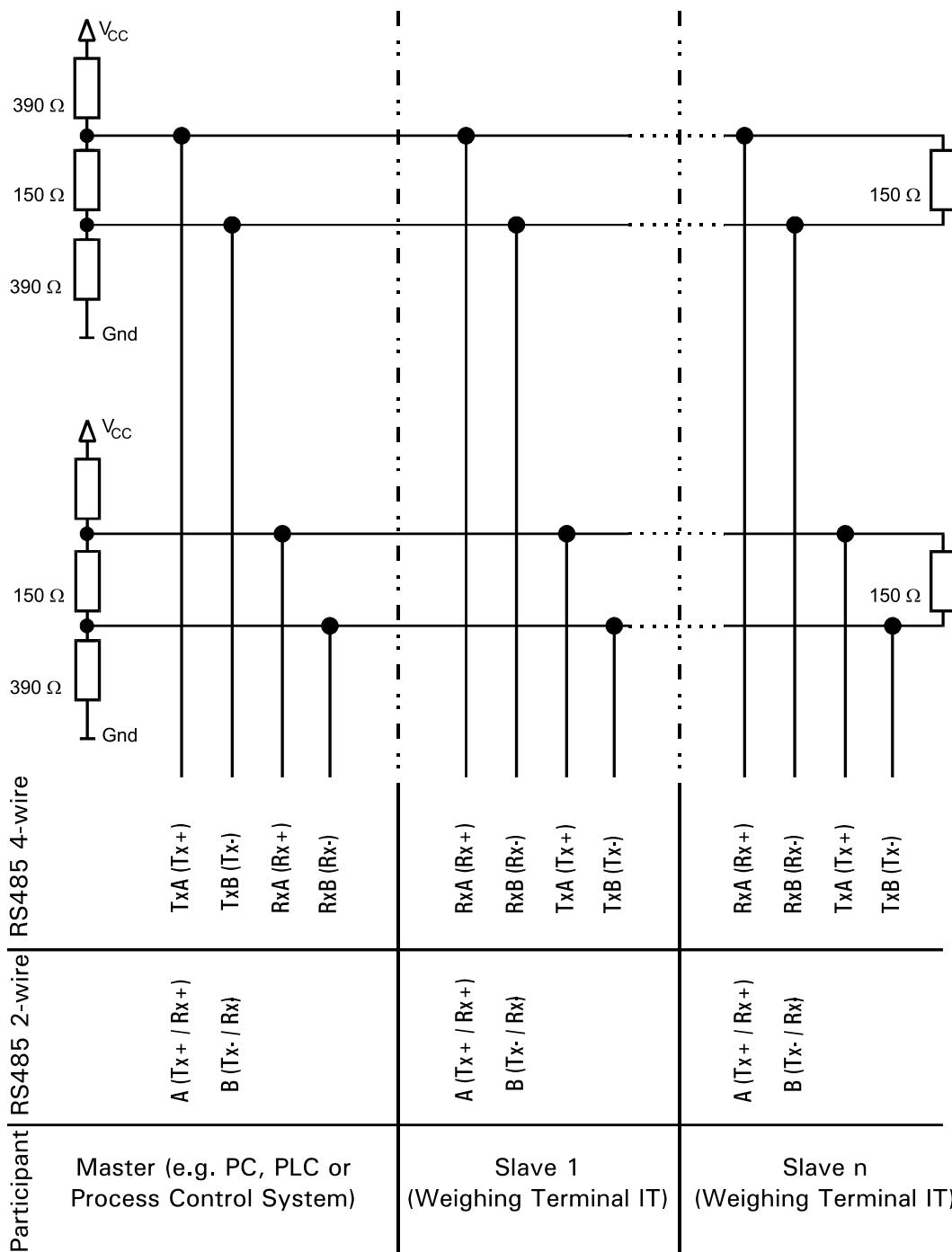
Terminal assignment: Some manufacturers of components with RS485 interface do not refer to the terminals TX+ and RX+ as 'A', but 'B' instead (correspondingly, the terminals TX- and RX- are not referred to as 'B', but 'A').

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 $R_{Term} = 150 \Omega$ on both ends of the cable.

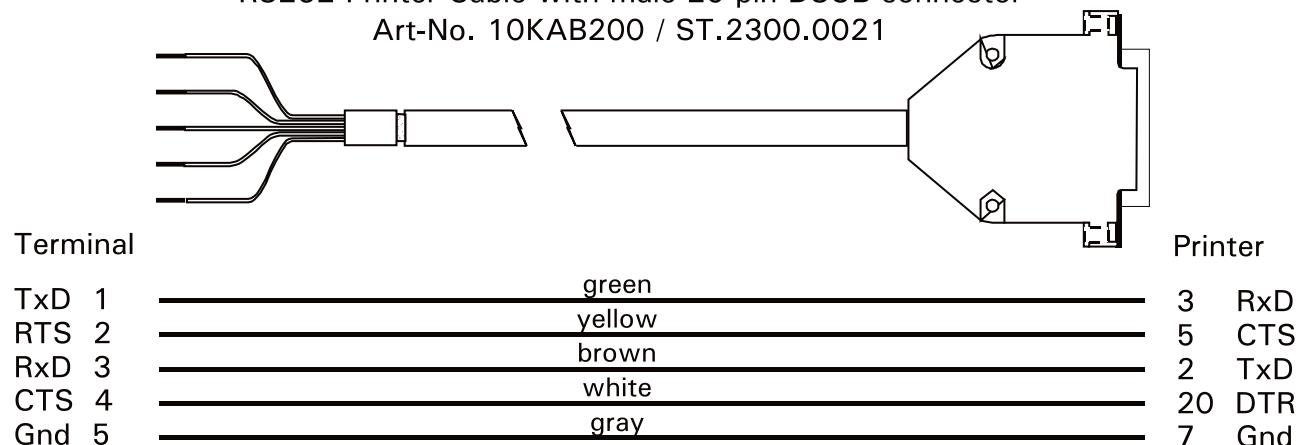
Pull-up / pull-down resistors: When termination resistors are used, also 390 Ω pull-up and pull-down resistors must be installed at the end of the cable (see schematic below). On the external I/O modules REL485 and TRIO485 all termination and pull-up/pull-down resistors are already part of the circuitry and can be activated/deactivated by means of jumpers.

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

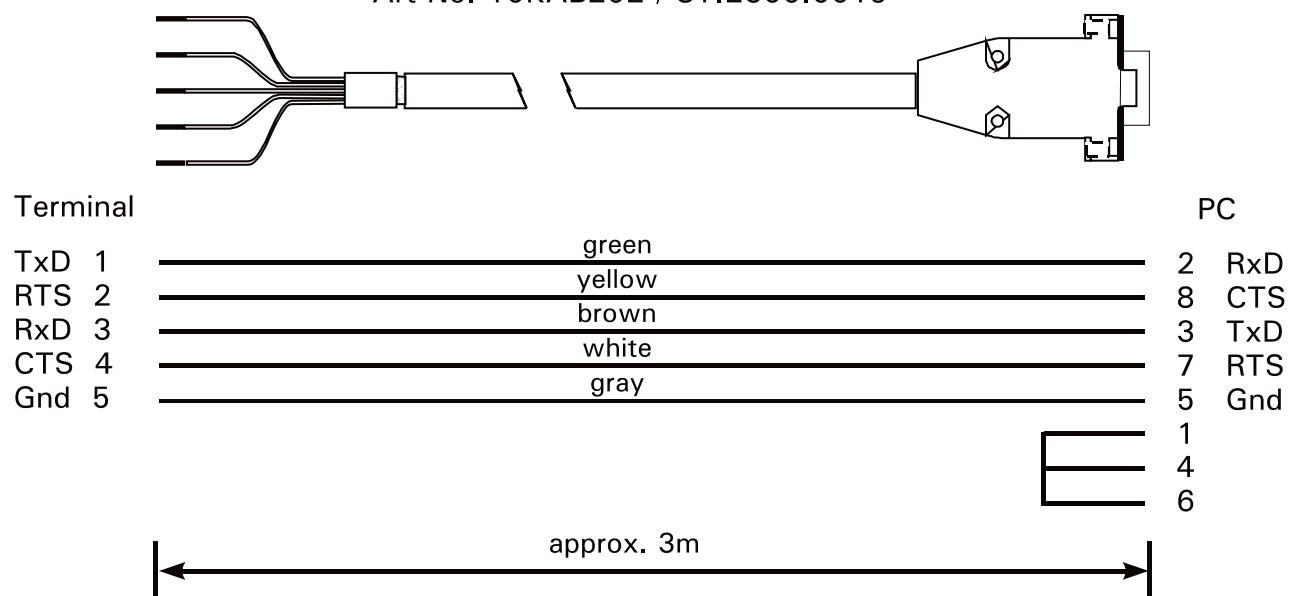


3.6.1 Standard Cables For Serial Interface

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



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



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 (Impulse Sensor Module) plugged into one of the sockets SIM1 or SIM2 (SIM3/4 on SPU).

At the terminal strip KLx dual-channel incremental sensors (pulse wheels) can be connected that operate on 10 VDC 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	100 mA max.
2	5V	-	
3	CHA	Pulse wheel channel A	Off = 0...3 V On = 7...10 V
4	CHB	Pulse wheel channel B	Off = 0...3 V On = 7...10 V
5	GND	GND supply for pulse wheel	

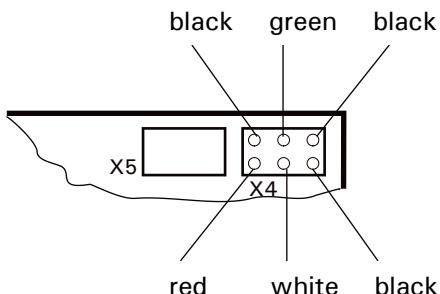
3.8 USB Connection

The SysTec 'USB memory stick, internal', No. 19OPT601 plugs directly into X5 on the mainboard. The USB connection can be led to the outside of the housing with one of the following options:

- 18OPT500, USB kit, USB socket protected to IP67, the counter nut must be firmly tightened;
- 10KAB431, patch cable 0.15 m with cable gland and USB socket type A;
- 10KAB433, patch cable 3 m 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 below:



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

When a USB keyboard is used, the following assignment applies:

USB keyboard	Terminal
F1–F6	F1–F6
F8	
F9	
F10	
F11	
F12	
Shift + F12	Access Service Mode
Tab	

3.9 Ethernet Connection

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

- 10KAB405, Ethernet cable 5 m with cable gland and RJ45 connector;
- 10KAB410, Ethernet cable 10 m 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 80 m

When assembling your own cables, the shield of the cable must be connected inside the cable gland as shown below:

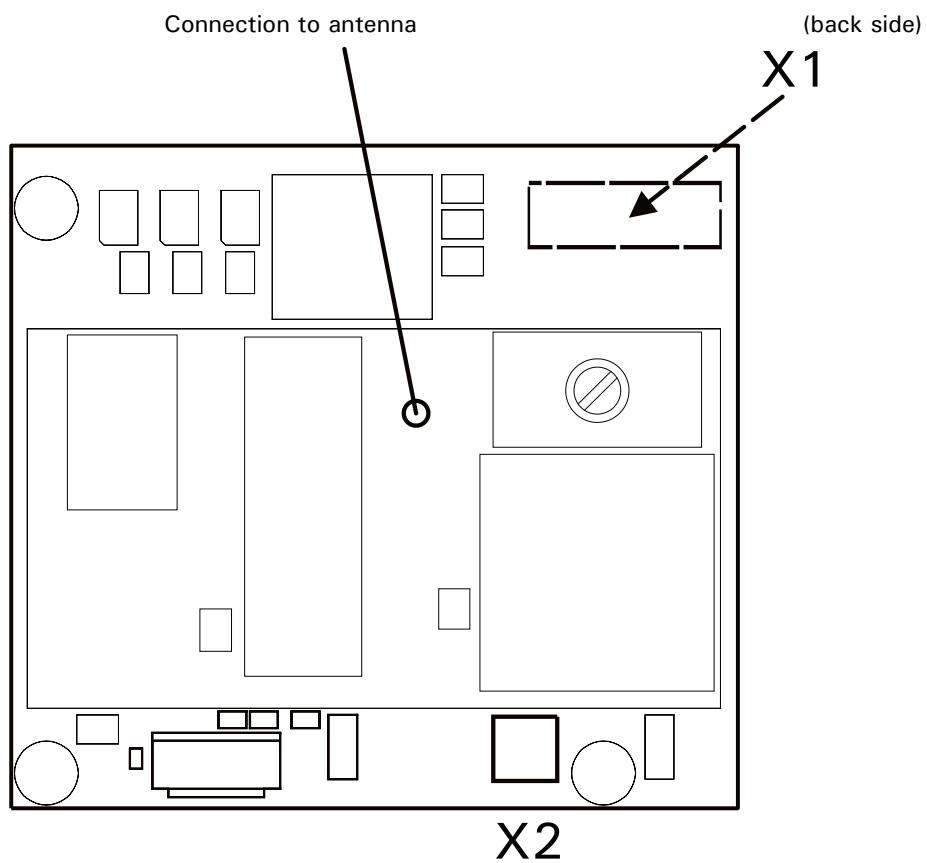


- Strip approx. 10 mm of cable jacket where cable gland is to be installed;
- Run cable through cable gland until shield of cable has reached the contact position;
- Tighten cable gland.

3.10 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.

For a description of WLAN settings refer to:

- WLX Installation Instructions, order-No. ST.2309.1590

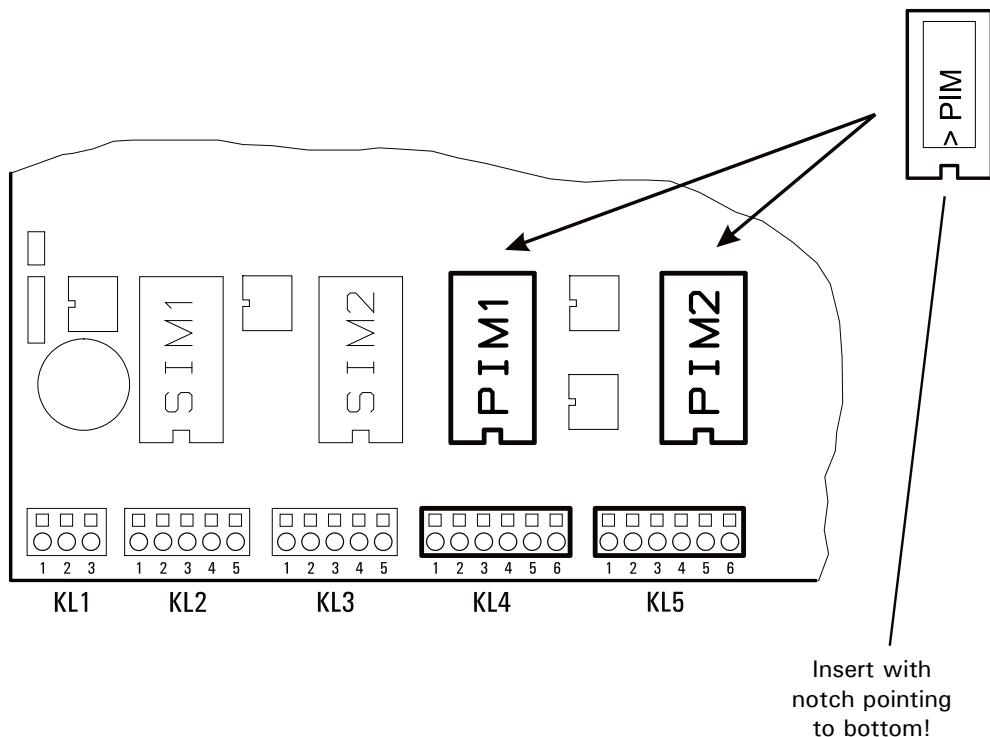
3.11 Connection Of Digital I/Os PIM

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

Rating of outputs: 12–24 VDC at 100 mA max.

Current consumption of inputs: 7 mA max. at 12–24 VDC.

Position and assignment of digital inputs/outputs on mainboard:



Terminal assignment

KL4 / 5: digital 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. 100 mA) 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.

With SPU interface expansion module additional digital interfaces can be connected. The sockets PIM3–PIM4 provide connection for up to 2 SIM modules.

Digital I/Os on SPU:			
PIM3 KL3	PIM4 KL4		
1		0V	
2		+ 12V	only for external switches! (See note below).
3		IN4	
4		IN5	
5		IN6	
6		IN7	
	1	IN–	for IN4–IN7
	2	OUT4	
	3	OUT5	
	4	OUT6	
	5	OUT7	
	6	OUT +	for OUT4–OUT7

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:

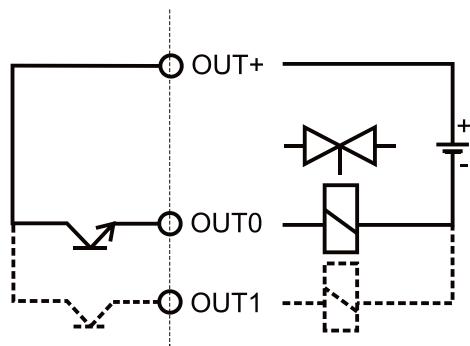
Shielded multicore cables, shield connected to ground on both sides. Flexible wires with wire end ferrules.	
Resistance	≤ 125 Ω/km
Gauge	0.2 mm ² to 0.5 mm ² max.
Capacitance	≤ 130 nF/km
Nominal voltage	≥ 250 V
Length	max. 15 m

Note:

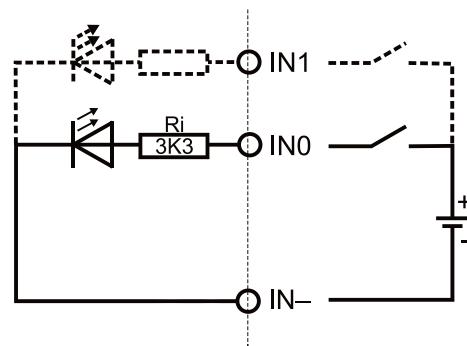
- For maximum suppression of interference, shield should be grounded on both sides.
- If fluctuation of the earth potential is experienced, this can cause an equalization current flowing over the shield. In this case a separate earth lead of appropriate diameter for potential equalization is required.
- The digital outputs on the mainboard and/or the SPU interface board use a common connection OUT +, the digital inputs a common connection IN–.

Principal schematics PIM:

Plus potential of the supply voltage for the two external outputs is connected to the common terminal OUT+. Minus potential of the supply voltage of the two digital inputs is connected to the common terminal IN-.



Digital output

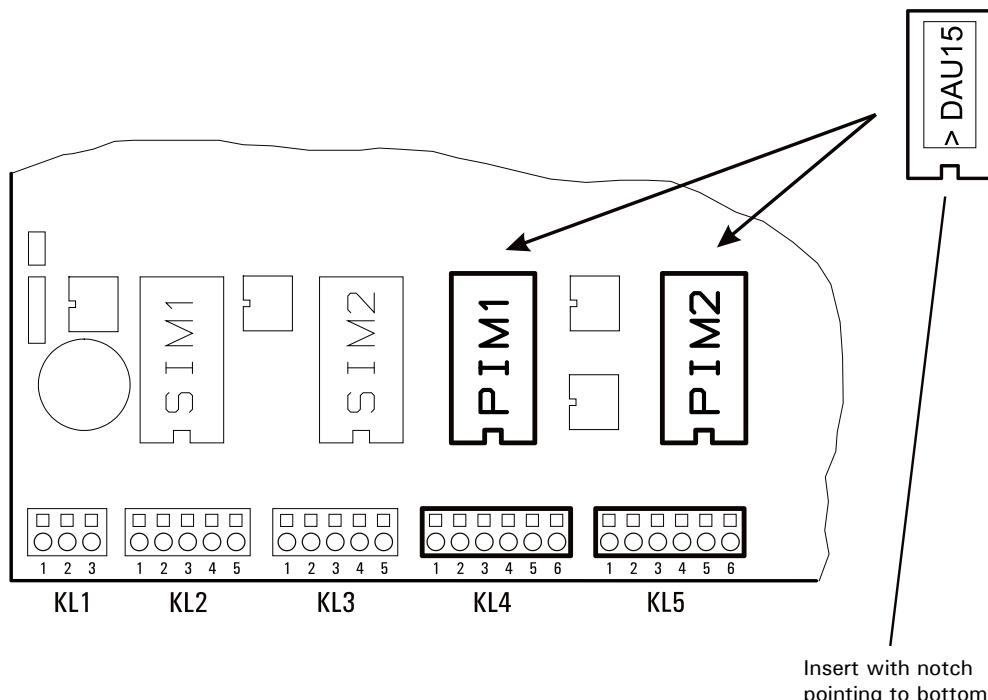


Digital input

3.12 Connection Of 15-Bit Analog Output (DAU15)

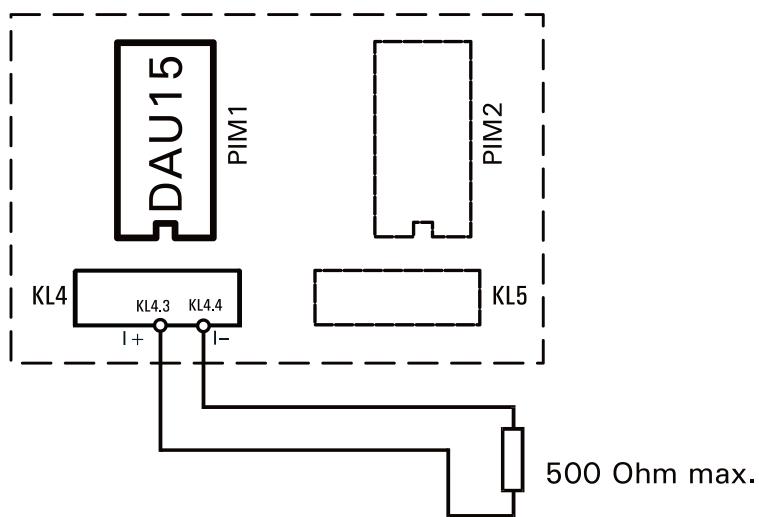
For the output of gross or net weight as analog 15-bit signal a plug-on module (DAU15) can be inserted in the socket PIM1 or PIM2 (PIM3/4 on SPU). The output signal has a resolution of 15 bit (32768 steps). The module can be configured in 'Config./Analog Out' of the Service Mode to 0/2–10 V or 0/4–20 mA. The output of the DAU15 module is active and potential free.

Installing the DAU15 in a PIM socket on the mainboard



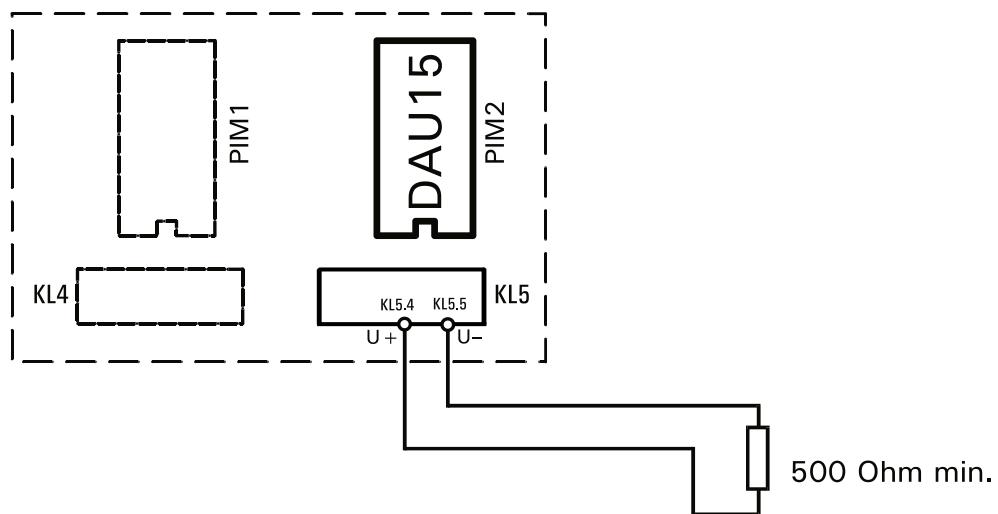
Terminal assignment of DAU15:						
DAU15 in socket:		Mainboard		SPU		
		PIM1	PIM2	PIM3	PIM4	
I+	+ Current output 0/4–20 mA	KL4.3	KL4.5	KL3.3	KL3.5	
I-	– Current output 0/4–20 mA	KL4.4	KL4.6	KL3.4	KL3.6	
U+	+ Voltage output 0/2–10 V	KL5.2	KL5.4	KL4.2	KL4.4	
U-	– Voltage output 0/2–10 V	KL5.3	KL5.5	KL4.3	KL4.5	

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



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

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

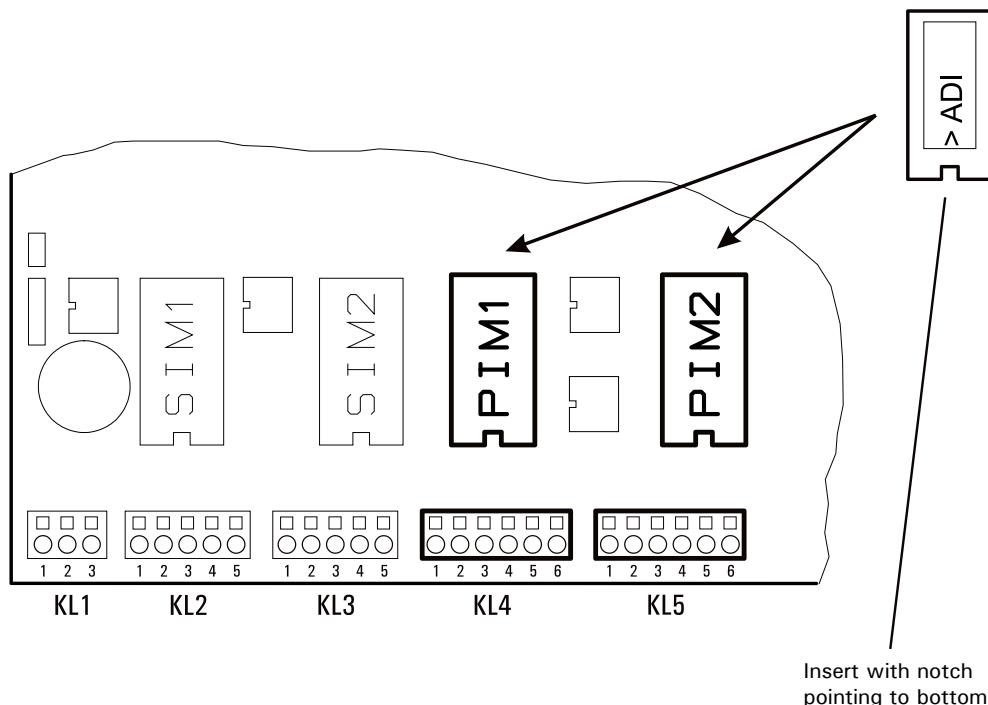


The impedance of the connected load must be equal or greater than 500 Ohm.

3.13 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 (PIM3/4 on SPU). The module can be configured in 'Config.\Ain\ADI' of the Service Mode to 0/2–10 V or 0/4–20 mA. 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



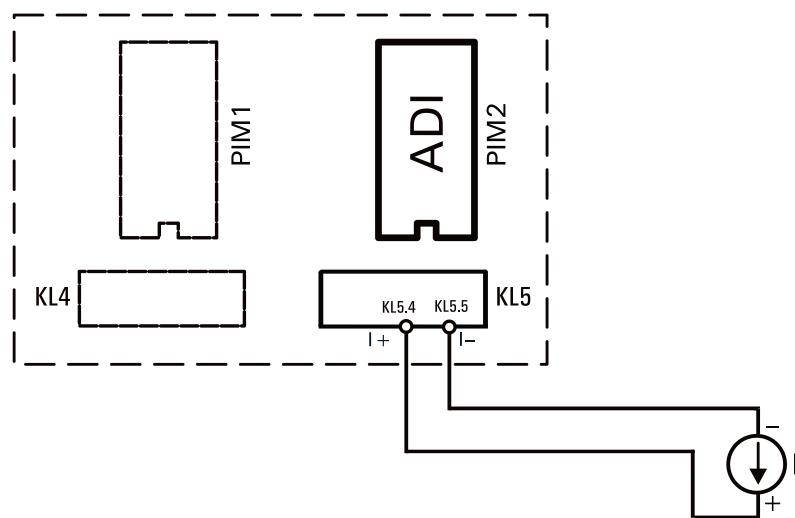
Terminal assignment of ADI:

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

The impedance of the current input is 24Ω .

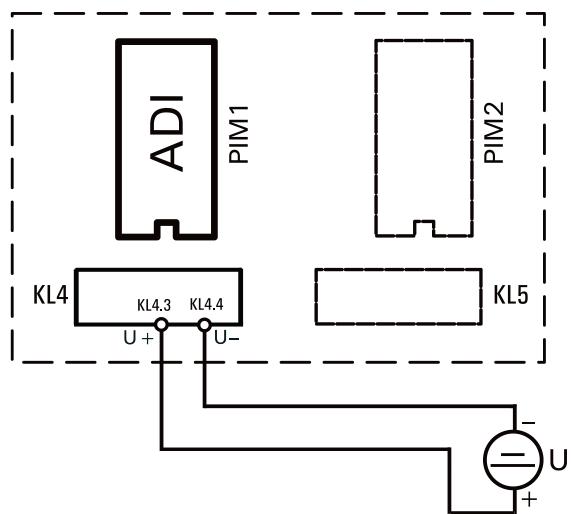
The impedance of the voltage input is $105 \text{ k}\Omega$.

Example for current input 0/4–20 mA (ADI in socket PIM2):



The impedance of the current input is $R_i = 24 \text{ Ohm}$.

Example for voltage input 0/2–10 V (ADI in socket PIM1):



The impedance of the voltage input is $R_i = 105 \text{ kOhm}$.

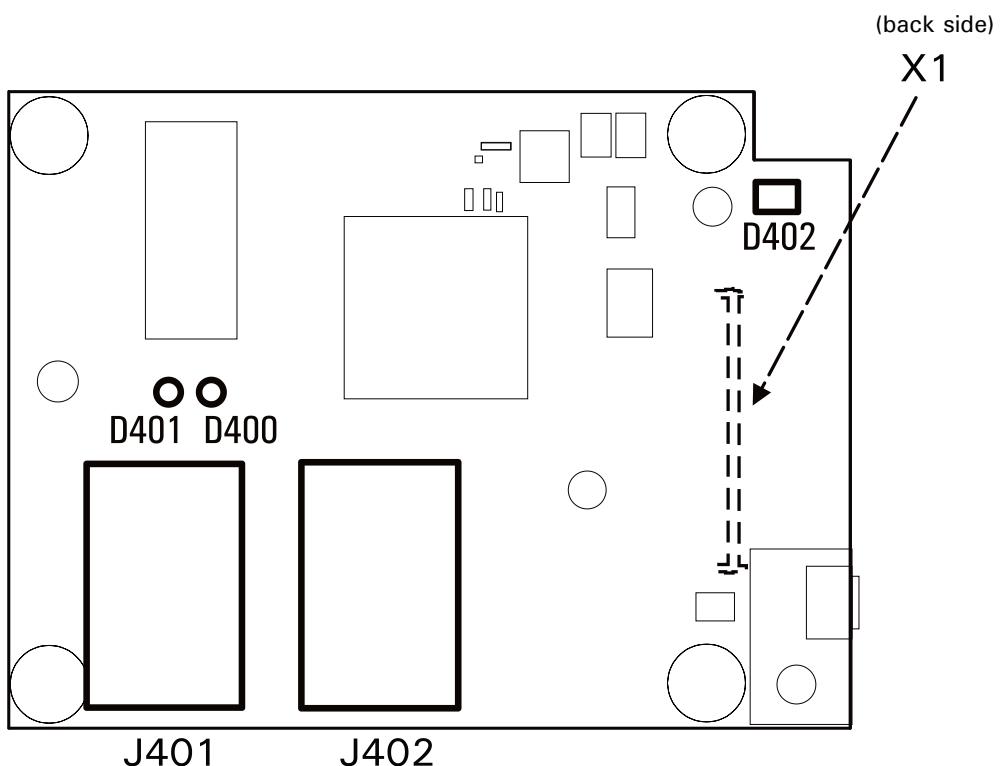
3.14 Connection Of Ethernet/IP-Module ETX

The extension module ETX enables the connection of the weighing terminal to Ethernet/IP networks.

Two RJ45 sockets are available for the connection to an Ethernet/IP network. They can be used to configure both, star or linear topology.

The internal switch required for linear topology is included in the ETX circuitry.

Connections on ETX module



Connector X1

Connector ETX	Socket mainboard
X1	X26

Socket J401, J402

Socket ETX	Ethernet/IP
J401	RJ45 line 1
J402	RJ45 line 2

3.14.1 External Connection Ethernet/IP

Connection to local 10/100 MBit Ethernet/IP networks is made with one of the following cables with RJ45 connector (plugged internally into J401 and/or J402 on the ETX board);

- 10KAB405, Ethernet cable 5 m with EMC cable gland and RJ45 connector;
- 10KAB410, Ethernet cable 10 m with EMC cable gland and RJ45 connector;
- 10KAB420, Ethernet cable with one EMC cable Glands and RJ45 connector, customized length, to be specified.

Note:

- Cable length of one segment without repeater (switch) max. 80 m;
- The required EMC cable gland is available under art. No. 10KAB422.

When assembling your own cables, the shield of the cable must be connected inside the cable gland as shown below:



- Strip approx. 10 mm 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.

3.14.2 Status LEDs

Module status LED:

D402 (green)

State	Indication
Off	Not activated in Service Mode
Flashing	No active Ethernet/IP connection
On	Ethernet/IP active

Ethernet/IP status LEDs:

D400 System Failure (red/green)

State	Indication
red	System error
green	System has been started

D401 Bus Failure (red/green)

State	Indication
red	No active connection
green	Connection to I/O IO controller active

3.14.3 Configuration Ethernet/IP

The Ethernet/IP module is activated in the Service Mode under 'Config\Fieldbus\Ethernet/IP'.

The IP address of the Ethernet/IP module is set in the PLC and not in the weighing terminal.

With the ETX extension module the weighing terminal works as Ethernet/IP unit, providing an I/O interface with up to 64 input words and up to 64 output words. The ETX module supports transmission speeds of up to 100 MBit/s. The contents of the individual data words is defined in the application program and described in the pertaining operation manual.

To configure the Ethernet/IP controller, an EDS file is required that you can download from our website 'www.systecnet.com'.

- Follow the link 'Service' and then 'Download Software'.

Download Software		
Datei	Dateigröße	Beschreibung
 EtherPort Tool 3.5.2.zip	(4.7MB)	IP-Konfiguration SysTec Ethernet
 GSD.zip	(39kb)	GSD Dateien Profibus DP
 GSDML-V2.2-SysTec_GmbH_0241-IT8000E-20121124.zip	(5kb)	PROFINET GSDML IT8000E PNU
 GSDML-V2.31-SysTec_GmbH_0241-ITx000(E)(M)-20150203.zip	(3kb)	PROFINET GSDML (Nicht PNU)
 IT2M046C.zip	(3kb)	GSD IT2000M Profibus DP
 IT4000E_app_20150427.01.update	(433kb)	IT4000E Applikations Firmware
 PC_Remote_Display_2.0.ZIP	(753kb)	PC Remote Display
 Systec_NETX_51-RE_EIS_V1_1.zip	(8kb)	Ethernet/IP - EDS Datei (ETX/ETU2000M)
 V3_20141125.1.IT468E.update		Link in neuem Tab öffnen Link in neuem Fenster öffnen Link in neuem privaten Fenster öffnen
 V3_20141125.1.IT9E.update		Lesezeichen für diesen Link hinzufügen Link teilen
 V3_20141125.1.ITxE_Sim.update		C Simulator Ziel speichern unter...

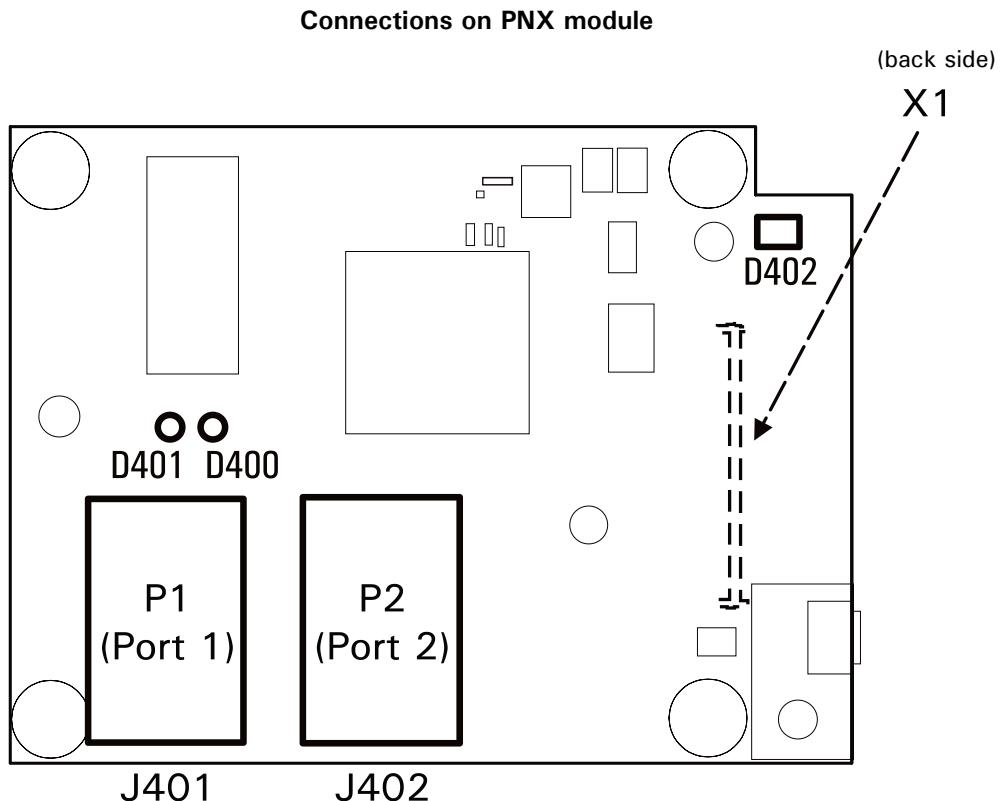
- Download the file 'Systec_NETX....zip' (click right on the link and choose 'Save target as'). Unzip file on your hard disk.

3.15 Connection Of PROFINET Module PNX

The extension module PNX enables the connection of the weighing terminal to PROFINET networks.

Two RJ45 sockets are available for the connection to a PROFINET network. They can be used to configure both, star or linear topology.

The internal switch required for linear topology is included in the PNX circuitry.



Connector X1

Connector PNX	Socket mainboard
X1	X26

Socket J401, J402

Socket PNX	PROFINET
J401	RJ45 line 1
J402	RJ45 line 2

3.15.1 External Connection PROFINET

Connection to local 10/100 MBit PROFINET networks is made with one of the following cables with RJ45 connector (plugged internally into X2 and/or X3 on the PNU board);

- 10KAB440, Profinet cable 5 m with EMC cable gland and RJ45 connector;
- 10KAB441, Profinet cable 10 m with EMC cable gland and RJ45 connector;
- 10KAB442 + 10KAB443 or 10KAB442 + 10KAB444, Profinet cable with one or two EMC cable glands and RJ45 connector, customized length, to be specified.

Note:

- Cable length of one segment without repeater (switch) max. 80 m;
- The required EMC cable gland is available under art. No. 10KAB422.

When assembling your own cables, the shield of the cable must be connected inside the cable gland as shown below:



- Strip approx. 10 mm 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.

3.15.2 Status LEDs

Module status LED:

D402 (green)

State	Indication
Off	Not activated in Service Mode
Flashing	No active PROFINET connection
On	PROFINET active

PROFINET status LEDs:

D400 System Failure (red/green)

State	Indication
red	System error
green	System has been started

D401 Bus Failure (red/green)

State	Indication
red	No active PROFINET connection
green	PROFINET connection to I/O IO controller active

3.15.3 PROFINET Configuration

The PROFINET module is activated in the Service Mode under 'Config\Fieldbus\PROFINET'.

The IP address of the PROFINET module is set in the PLC and not in the weighing terminal.

With the PNX extension module the weighing terminal works as PROFINET I/O unit, providing an I/O interface with up to 64 input words and up to 64 output words. The PNU module supports transmission speeds of up to 100 MBit/s. The contents of the individual data words is defined in the application program and described in the pertaining operation manual.

To configure the PROFINET I/O controller, a GSDML file is required that you can download from our website 'www.systecnet.com'.

- Follow the link 'Service' and then 'Download Software'.

download software		
File	Filesize	Description
 EtherPort Tool 3.5.2.zip	(4.7MB)	SysTec Ethernet IP configuration
 GSD.zip	(50kb)	GSD Files Profibus DP
 GSDML.zip	(21kb)	GSDML Files PROFINET
Open link in new tab		Application Firmware
Open link in new window		Application Firmware
Open link in incognito window		note Display
Save link as...		P - EDS File (ETX/ETU2000M)
Copy link address		IT4000E, IT6000E, IT8000E with Certificate Id 3
Inspect element	Ctrl+Shift+I	IT9000E

- Download the file 'GSDML.zip' (click right on the link and choose 'Save Target/Link as'). Unzip file on your hard disk.

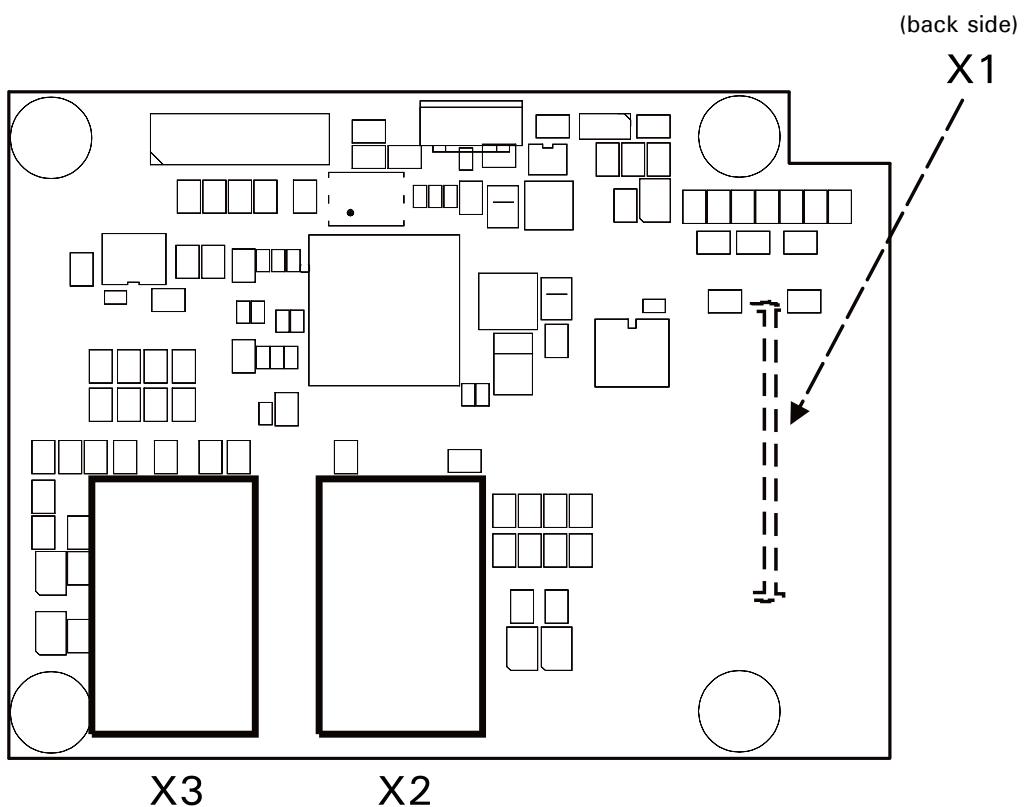
3.16 Connection Of PROFINET Module PNU

The extension module PNU enables the connection of the weighing terminal to PROFINET networks.

Two RJ45 sockets are available for the connection to a PROFINET network. They can be used to configure both, star or linear topology.

The internal switch required for linear topology is included in the PNU circuitry.

Connections on PNU module



Connector X1

Connector PNU	Socket mainboard
X1	X26

Socket X2, X3

Socket PNU	PROFINET
X2	RJ45 line 1
X3	RJ45 line 2

3.16.1 External Connection PROFINET

Connection to local 10/100 MBit PROFINET networks is made with one of the following cables with RJ45 connector (plugged internally into X2 and/or X3 on the PNU board);

- 10KAB440, Profinet cable 5 m with EMC cable gland and RJ45 connector;
- 10KAB441, Profinet cable 10 m with EMC cable gland and RJ45 connector;
- 10KAB442 + 10KAB443 or 10KAB442 + 10KAB444, Profinet cable with one or two EMC cable glands and RJ45 connector, customized length, to be specified.

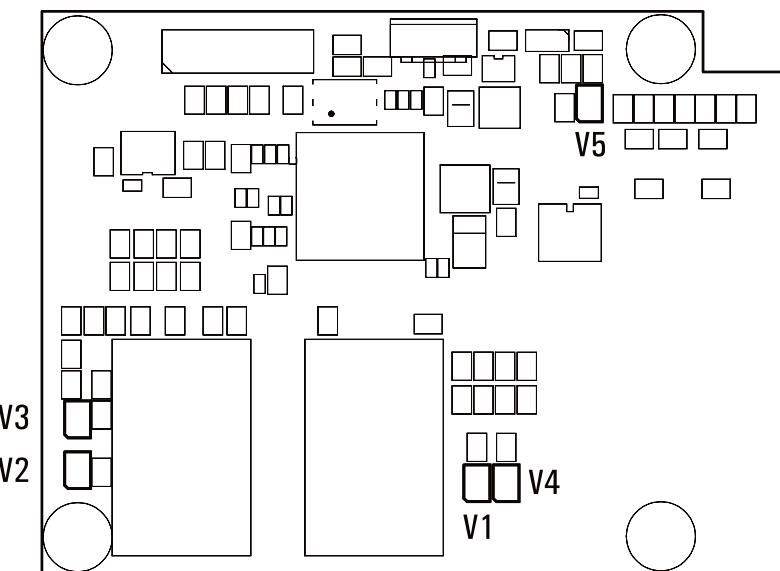
Note:

- Cable length of one segment without repeater (switch) max. 80 m;
- The required EMC cable gland is available under art. No. 10KAB422.

When assembling your own cables, the shield of the cable must be connected inside the cable gland as shown below:



- Strip approx. 10 mm 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.

**Module status LED:****V5 (green)**

State	Indication
Off	Not activated in Service Mode
Flashing	No active PROFINET connection
On	PROFINET active

PROFINET status LEDs:**V1 maintenance (yellow)**

State	Indication
Off	Maintenance not required
On	Maintenance required

V2 system fail (red)

State	Indication
Off	PROFINET diagnosis available
On	No PROFINET diagnosis available

V3 bus failure (red)

State	Indication
Off	Error / not configured (when terminal is switched on)
Flashing	PROFINET connection active, no communication with another PROFINET I/O controller
On	Profibus connection active

V4 device ready (green)

State	Indication
Off	PNU module not correctly initialized
Flashing	Waiting on connection to CPU8000E module
On	PNU module correctly initialized

3.16.2 PROFINET Configuration

The PROFINET module is activated in the Service Mode under 'Config\Fieldbus\PROFINET'.

The IP address of the PROFINET module is set in the PLC and not in the weighing terminal.

With the PNU extension module the weighing terminal works as PROFINET I/O unit, providing an I/O interface with up to 64 input words and up to 64 output words. The PNU module supports transmission speeds of up to 100 MBit/s. The contents of the individual data words is defined in the application program and described in the pertaining operation manual.

To configure the PROFINET I/O controller, a GSDML file is required that you can download from our website 'www.systecnet.com'.

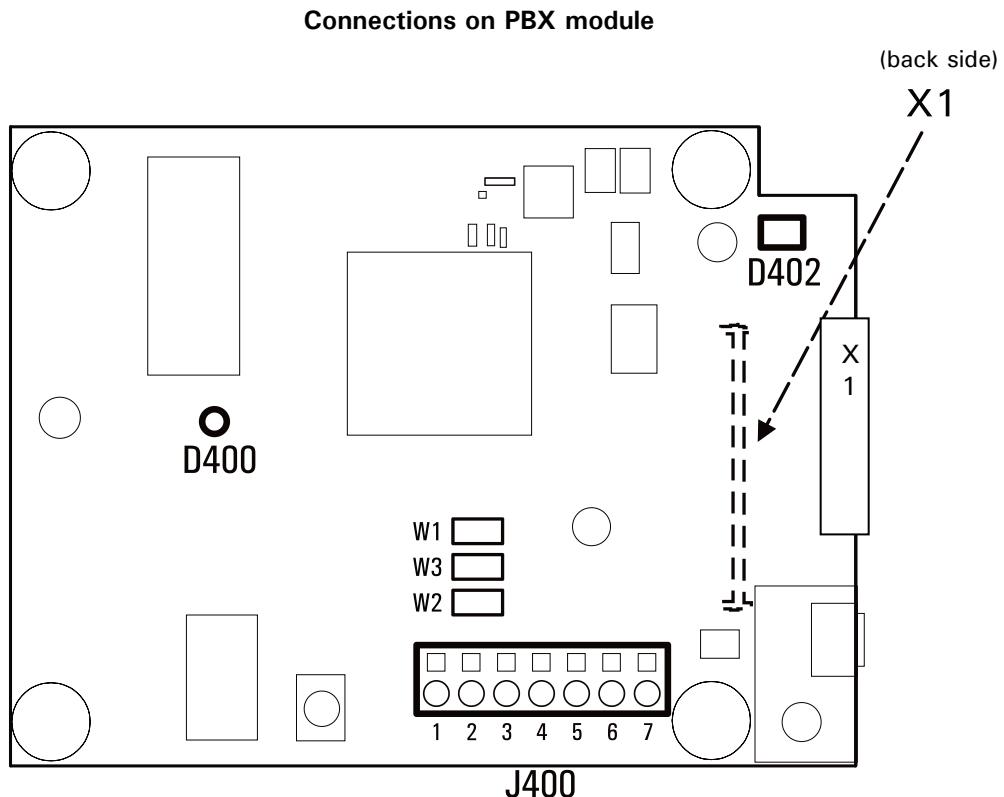
- Follow the link 'Service' and then 'Download Software'.

download software		
File	Filesize	Description
 EtherPort Tool 3.5.2.zip	(4.7MB)	SysTec Ethernet IP configuration
 GSD.zip	(50kb)	GSD Files Profibus DP
 GSDML.zip	(21kb)	GSDML Files PROFINET
Open link in new tab		Application Firmware
Open link in new window		Application Firmware
Open link in incognito window		note Display
Save link as...		P - EDS File (ETX/ETU2000M)
Copy link address		IT4000E, IT6000E, IT8000E with Certificate Id 3
Inspect element	Ctrl+Shift+I	IT9000E

- Download the file 'GSDML.zip' (click right on the link and choose 'Save target/link as'). Unzip file on your hard disk.

3.17 Connection Of Profibus Module PBX

The PBX expansion board provides connection of the weighing terminal to the Profibus DP field bus.



Connector X1

Connector PBX	Socket mainboard
X1	X26

Terminal assignment J400

J400	Profibus DP
1	RTS
2	Gnd 5V
3	+ 5V
4 / 6	B Line
5 / 7	A Line

3.17.1 Status LEDs

LED D402

State	Indication
Off	Error / Not activated in Service Mode
Flashing	No active Profibus connection
On	Profibus connection active

PROFIBUS-Status LEDs:**D400 System Failure (red/green)**

State	Indication
red	System error
green	System has been started

Function of jumpers W1–W3

Jumper	Profibus DP interface
W1	Pull-up resistor
W2	Termination resistor
W3	Pull-down resistor

If the terminal is connected to a physical end of the Profibus DP bus, the jumpers W1, W2 and W3 must be set to terminate the bus. The line is terminated when the jumpers are closed.

3.17.2 Configuration of Profibus DP

The Profibus address is set in Service Mode (see also Installation Instructions of application program). With the PBX expansion module the weighing terminal operates as a Profibus DP slave, with an I/O interface (up to 64 inputs and outputs) or a data interface with up to 64 input words and up to 64 output words. The PBX module is designed for transmission speeds of 12 MBit/s. The definition of the individual data words depends on the application and is specified in the Installation Instructions pertaining to the respective product.

For the configuration of the Profibus master, a GSD file is required that you can download from our website 'www.systecnet.com'.

- Follow the link 'Service' and from there to 'download software'.

download software

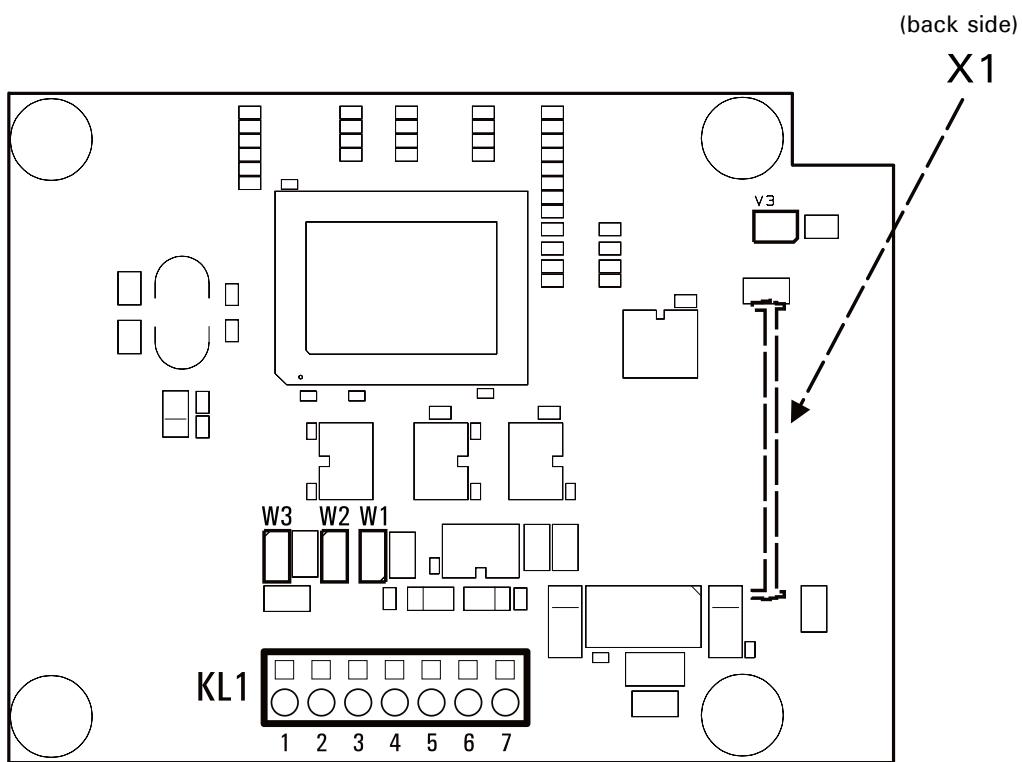
File	Filesize	Description
EtherPort Tool 3.5.2.zip	(4.7MB)	SysTec Ethernet IP configuration
GSD.zip	(50kb)	GSD Files Profibus DP
Open link in new tab		Files PROFINET
Open link in new window		Application Firmware
Open link in incognito window		Application Firmware
Save link as...		Site Display
Copy link address		P - EDS File (ETX/ETU2000M)
Inspect element	Ctrl+Shift+I	IT4000E, IT6000E, IT8000E with Certificate Id
V3_20150714.1.IT9E.update	(3.3MB)	Firmware IT9000E

- Download the file 'GSD.zip' (click right on the link and choose 'Save target/link as'). Unzip file on your hard disk.

3.18 Connection Of Profibus Module PBU

The PBU expansion board provides connection of the weighing terminal to the Profibus DP field bus.

Connections on PBU module



Connector PBU	Socket mainboard
X1	X26

Terminal assignment Profibus DP interface:

KL1	Profibus DP
1	RTS
2	Gnd 5V
3	+5V
4 / 6	B Line
5 / 7	A Line

LED Profibus interface V3:

Off	Error / Not activated in Service Mode
Flashing	No active Profibus connection
On	Profibus connection active

Function of jumpers W1–W3

Jumper	Profibus DP interface
W1	Pull-up resistor
W2	Termination resistor
W3	Pull-down resistor

If the terminal is connected to a physical end of the Profibus DP bus, the jumpers W1, W2 and W3 must be set to terminate the bus. The line is terminated when the jumpers are closed.

3.18.1 Configuration of Profibus DP

The Profibus address is set in Service Mode (see also Installation Instructions of application program). With the PBU expansion module the weighing terminal operates as a Profibus DP slave, with an I/O interface (up to 64 inputs and outputs) or a data interface with up to 64 input words and up to 64 output words. The PBU module is designed for transmission speeds of 12 MBit/s. The definition of the individual data words depends on the application and is specified in the Installation Instructions pertaining to the respective product.

For the configuration of the Profibus master, a GSD file is required that you can download from our website 'www.systecnet.com'.

- Follow the link 'Service' and from there to 'download software'.

download software

File	Filesize	Description
EtherPort Tool 3.5.2.zip	(4.7MB)	SysTec Ethernet IP configuration
GSD.zip	(50kb)	GSD Files Profibus DP
Open link in new tab		Files PROFINET
Open link in new window		Application Firmware
Open link in incognito window		Application Firmware
Save link as...		Configure Display
Copy link address		P - EDS File (ETX/ETU2000M)
Inspect element	Ctrl+Shift+I	IT4000E, IT6000E, IT8000E with Certificate Id
V3_20150714.1.IT9E.update	(3.3MB)	Firmware IT9000E

- Download the file 'GSD.zip' (click right on the link and choose 'Save target/link as'). Unzip file on your hard disk.

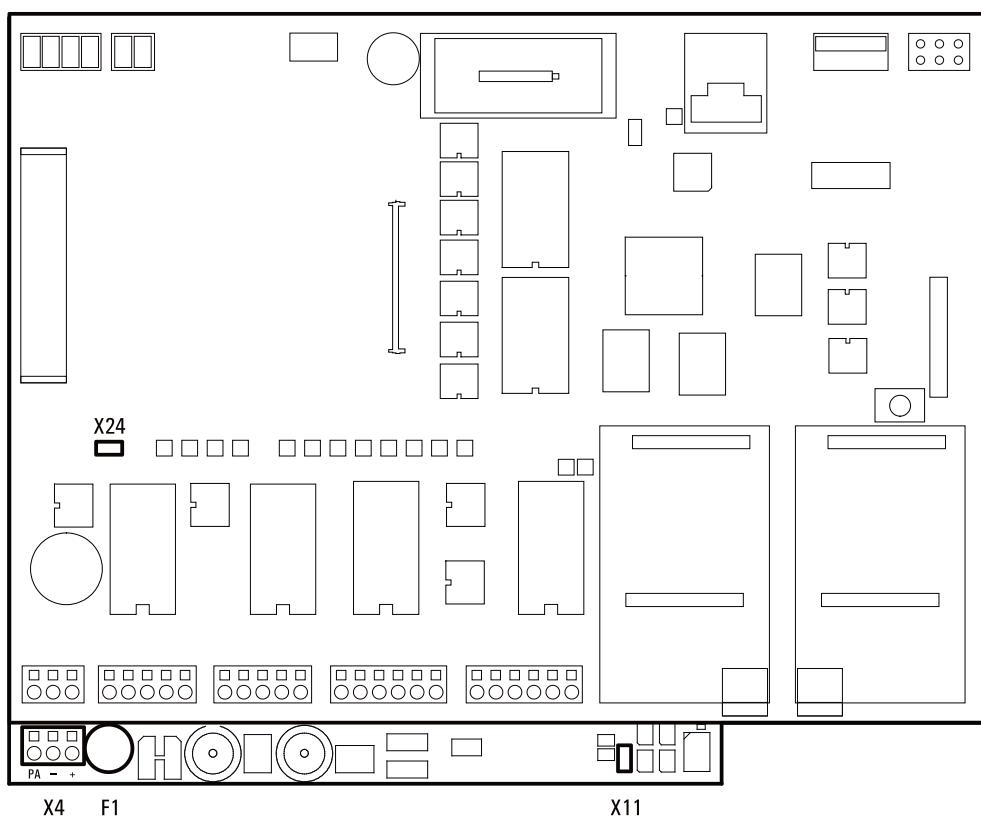
3.19 Connection To Power Supply 12–30 VDC

IT8000ET 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 (30 W, 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 (2 A T). A diode serves as protection against polarity reversal.

Terminal assignment X4

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



3.20 Enable On/Off Switch



The jumper X11 on the lower basic board PTA determines the function of the on/off switch:

Jumper X11 inserted:

On/off switch disabled, when connected to power supply the terminal starts immediately.

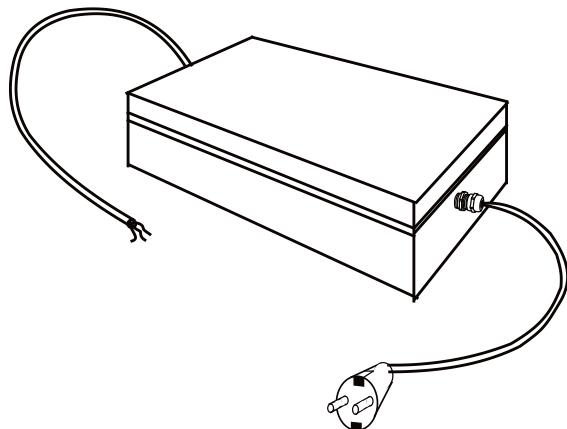
Jumper X11 removed:

The terminal only starts after pressing the on/off switch.

The jumper X24 on the upper mainboard needs to be always connected!

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

'ITX000ET Externes Netzteil' (external power supply) is suitable for the supply of the IT8000ET weighing terminal. For connection to the 110–240 VAC mains supply it has a line cord with safety plug. The output voltage of 12 VDC is available at a 2-core cable of 1 m length with free ends and can be connected at the input terminals X4 of the IT8000ET weighing terminal.



Technical data and assignment:

Input:	
Input voltage:	110–240 VAC / 47–63 Hz; 0.4-0.2 A
Connection:	Line cord of 2.5 m length with safety plug
Output:	
Output voltage:	12 VDC; 2.0 A
Connection:	2-core cable of 1 m length, color code: brown: +12 VDC white: 0 VDC

Safety advice:

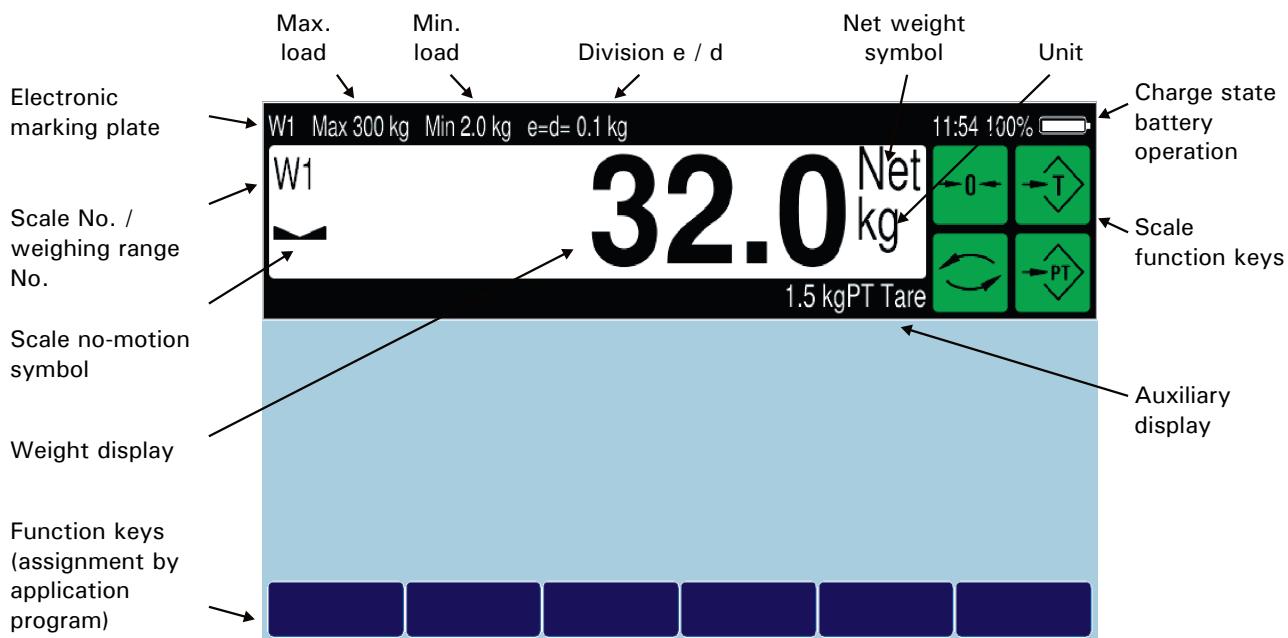
- Input voltage of the unit must comply with local mains supply: 110–240 VAC / 47–63 Hz.
- The mains supply of the unit should not be used at the same time for machines or equipment that can cause interference (e.g. motors, relays, heaters, etc.). Even short spikes or interruptions may affect the function 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 2.5 m 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!

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 / WLAN connection / Firmware Information / Monitor options
-  **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)

Note: The electronic marking plate is blanked when parameter 'Service Mode\Calibration\Adaptation\Onscreen typeplate = N' is set, it is also blanked for certain types of scale platforms.

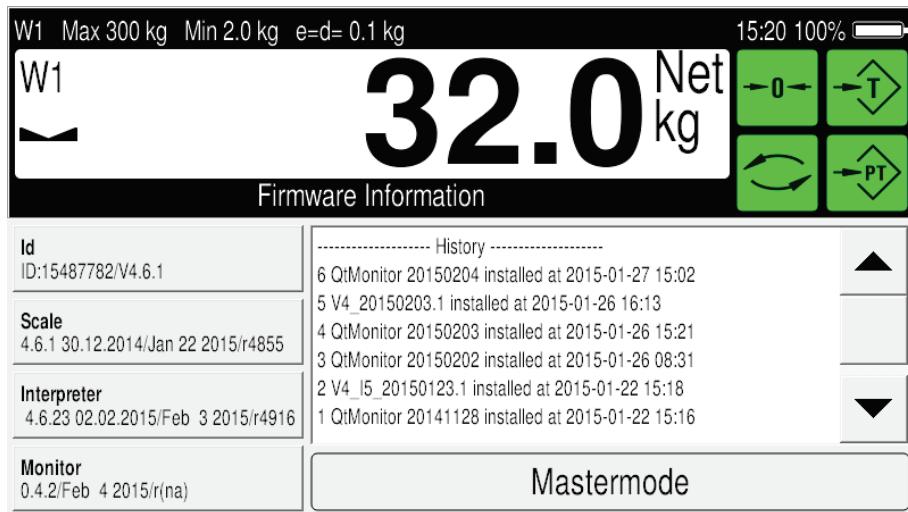
Scale No.	W1 ... W8	No. of scale selected via Scale Select Key.
Max Load	e.g.: Max 3000 kg	Maximum load (without additive tare), selectable in calibration mode.
Min Load	e.g.: Min 20 kg	Permissible minimum load.
Division e / d	e.g.: e=d=1 kg	Approved division e and display graduation d (in most cases 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).
Zero Symbol	>0<	Scale in gross zero range (± 0.2 d)
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	12.9 kgT	Display of tare weight
Gross	1000 kg	Display of gross weight
		Gross weight bargraph (zero to max load)
Approved weight storage		W&M approved data archive (see chapter 'Data Archive')
WLAN connected with <SSID>		WLAN connected with 'Network name'
WLAN signal power III (-57 dBm)		WLAN signal power
Firmware information		Show details of firmware version, Enter Master Mode
Monitor options		Adjusting the contrast of the display

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

Switching to layout of alphanumeric keyboard

Switching to layout of numeric keyboard

Shift-key for capital letters

Delete characters

Enter-key

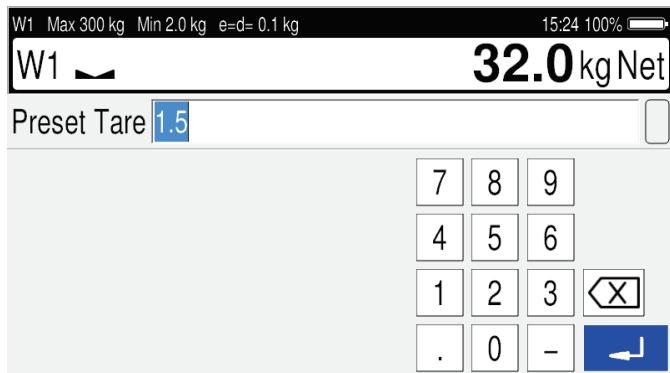
Special characters can be entered by pressing and holding one of the following keys; A, C, E, I, O, S, U, Y, and a, c, e, i, o, s, u, y

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:

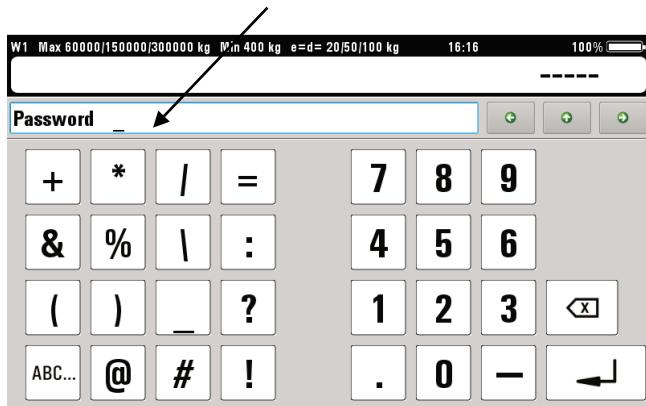
- This weighing terminal and its associated equipment must be installed, adjusted and maintained by qualified personnel only!
- Before accessing the Service Mode all peripheral devices must be installed and configured!
- Access to the Service Mode is protected by the Service Password (see also last page 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: 99999999 / V9.99

Show ident No. of operating system and version of W&M approved software for 2 sec and continue.

Password ????

Entry of password (4 digits)



Back to normal operation



Show ID / MAC address / IP Address / Serial number

Wrong password:

Invalid Password!

Repeat entry of password

**Service Mode options:**

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



Choose displayed group.

Service: Interface

Configure interfaces;
(see chapter 'Interface Configuration')

Service: General

Enter setup parameters: language, format of date, etc.
(see chapter 'Entry Of Parameters (General)')

Service: Calibration

Calibrate scale;
(see chapter 'Calibration Mode')

Service: Config.

Configure scale, digital I/Os, analog outputs
(see chapter 'Configuration')

Service: Test

Test hardware;
(see chapter 'Test (Hardware)')

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')

Service: Licenses

Activate license for PC *ScaleView*
(see chapter 'Licenses')

Service: Backup

Data backup and restoring
(see chapter 'Backup')

When the Service Mode is exited the entered or changed parameters are stored.

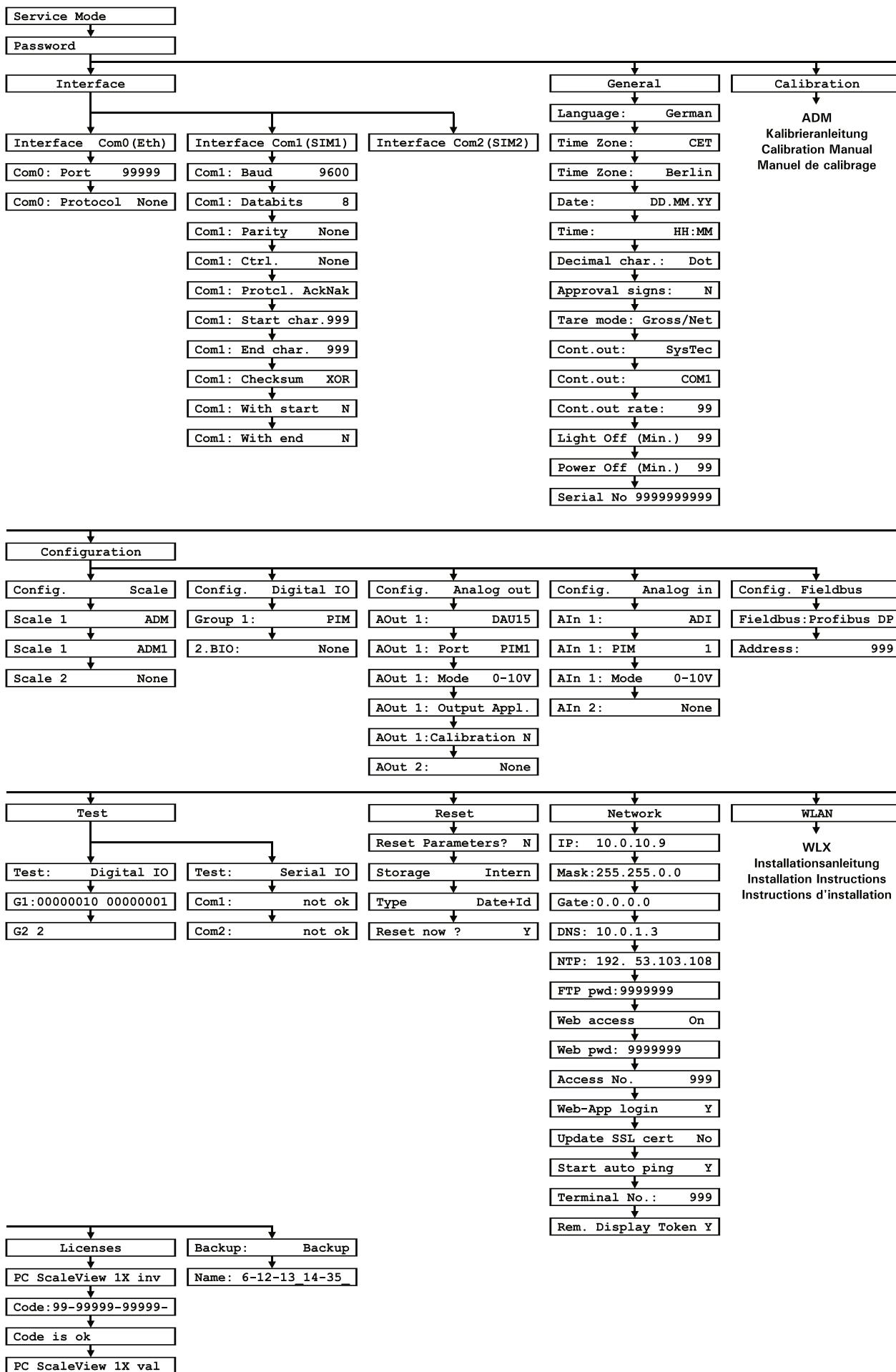
Saving...

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

**CAUTION**

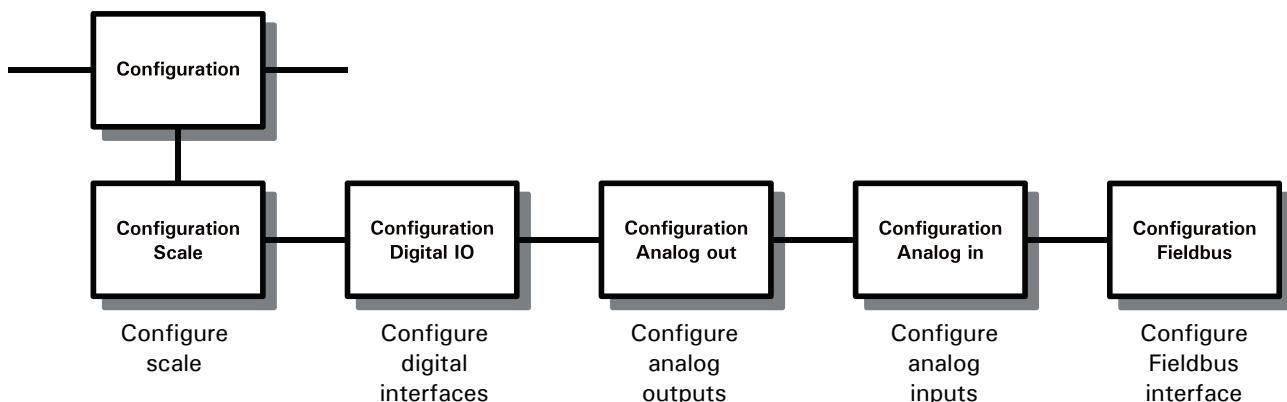
Under no circumstances switch off power while 'Saving...' is displayed, because that will inevitably destroy the contents of the Flash-EPROM and thus the program.

5.3 Overview Service Mode

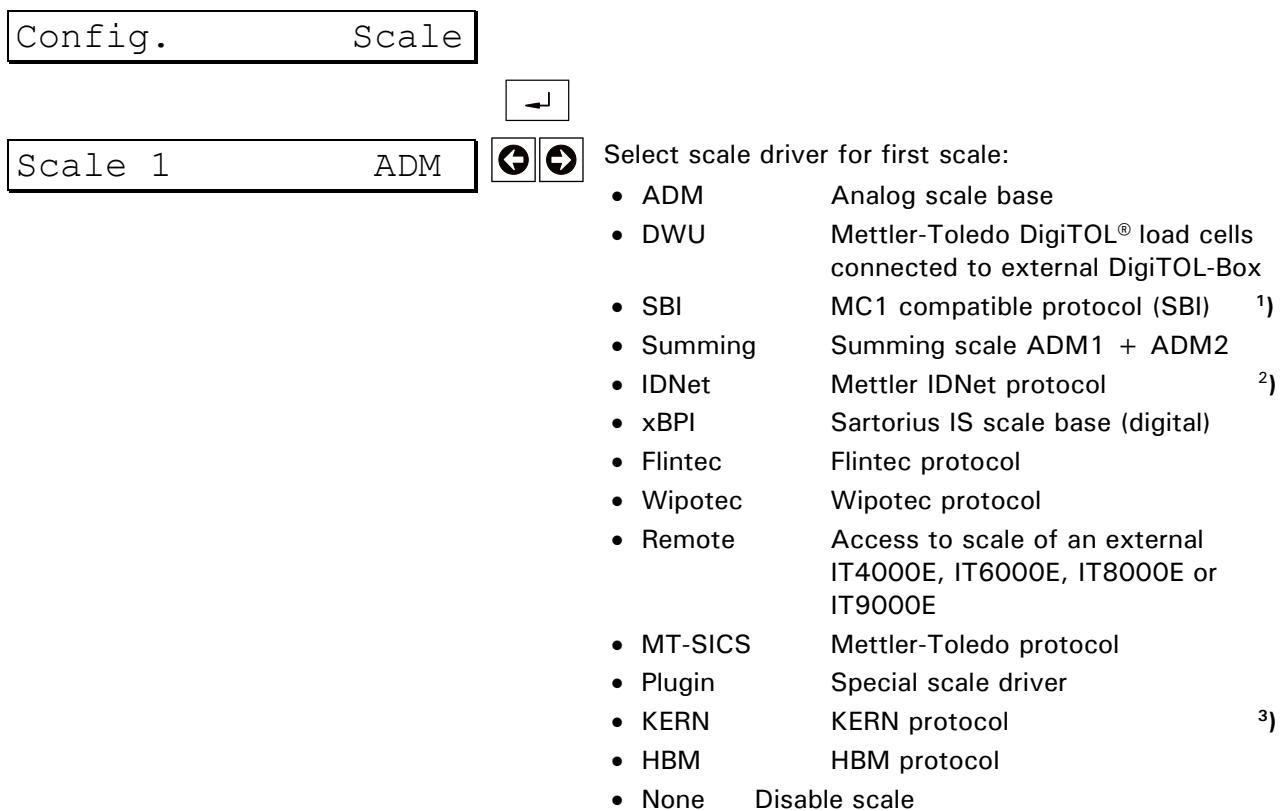


6 Configuration

Choose group 'Config.' from Service Mode menu.



6.1 Configure 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 series EW and DS.

Not if 'Summing' or 'Remote' was chosen:

Scale 1

ADM1



Select scale interface:

- ADM1 ADM in socket ADM1
 - ADM2 ADM in socket ADM2
 - SIM 1-x via serial interface
 - IDN1 IDN in socket ADM1
 - DWB1 DWB in socket ADM1
 - DWB2 DWB in socket ADM2

Summing chosen:

Sum 1+2



Choose platforms for summing function:

- Sum $1 + 2$
 - Sum $1 + 3$
 - Sum $2 + 3$
 - Sum $1 + 2 + 3$

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	ADM2	SIM1	SIM2	SIM3	SIM4	IDN1	DWB1	DWB2
ADM	ADM	ADM	SIM	SIM	SIM	SIM		DWB	DWB
DWU			SIM	SIM	SIM	SIM		DWB	DWB
SBI			SIM	SIM	SIM	SIM			
Summing									
IDNet			SIM	SIM/IDN	SIM	SIM	IDN		
xBPI								DWB	DWB
Flintec								DWB	DWB
Wipotec								DWB	
Remote									
MT-SICS			SIM	SIM	SIM	SIM			
Kern			SIM	SIM	SIM	SIM			
HBM								DWB	DWB

6.2 Configure Digital I/Os

Config. Digital IO

Configure I/Os

Group 1: PIM



Select type 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
- SIO I/O module in socket SIMx
- None Not applicable

REL/TRIO or SIO selected:

Group 1: Port SIM1



Assignment to serial interface SIM1–SIMx

Modbus TCP selected:

IP

Enter IP address for the local net.

Group 2: 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:

- 0–10 V, 2–10 V, 0–20 mA or 4–20 mA

AOut 1: Output Appl.



Select operating mode:

- Appl. Controlled by application program
- Gross Gross weight
- Net Net weight

Gross or Net selected:

AOut 1: Scale 1

Entry of scale for output of gross / 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 = 0



Calibrate zero signal, e.g. =0 V.

Stepwise increase / decrease analog signal.

AOut 1: 10V = 255



Calibrate full signal, e.g. 10 V.

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:

- 0–10 V, 2–10 V, 0–20 mA or 4–20 mA

AOut 1: Output Appl.



Select operating mode:

- Appl. Controlled by application program
- Gross Gross weight
- Net Net weight

Gross or Net selected:

AOut 1: Scale 1

Entry of scale for output of gross / 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 = 6928



Calibrate zero signal, e.g. =0 V.

Stepwise increase / decrease analog signal.

AOut 1: 10V = 63575



Calibrate full signal, e.g. 10 V.

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

1.MAI:	SIM1		Select pertaining internal serial interface:
--------	------	--	--

- SIM1–SIMx

1.MAI:	Address 0		Select pertaining internal address:
--------	-----------	--	-------------------------------------

- Address 0–Address 7 equivalent MAI Address 16–Address 23

1.MAI:	Module X1		Select external MAI module:
--------	-----------	--	-----------------------------

- Module X1–module X4

1.MAI:	0-10V		Select input signal:
--------	-------	--	----------------------

- 0–10 V, 2–10 V, 0–20 mA, 4–20 mA

2.AIn:	None	Continue with next analog input.
--------	------	----------------------------------

6.4.2 ADI Chosen

AIn 1: PIM	1		Select pertaining internal digital interface:
------------	---	--	---

- PIM1–PIMx

AIn 1: Mode	0-10V		Select input signal:
-------------	-------	--	----------------------

- 0–10 V, 2–10 V, 0–20 mA or 4–20 mA

AIn 2:	None	Continue with next analog input.
--------	------	----------------------------------

6.5 Configure Fieldbus Module

Config.	Fieldbus	Configure Fieldbus
Fieldbus: Profibus DP		<input type="radio"/> <input checked="" type="radio"/> Select Fieldbus connection: <ul style="list-style-type: none"> • Profibus DP Internal Profibus module PBU • Modbus TCP Via Ethernet • PROFINET Internal PROFINET module PNU • ETHERNET-IP Internal ETHERNET-IP module • Off Not applicable
'Profibus DP' chosen:		
Address :	999	Enter slave address

Modbus services supported:

Function Code	Instruction	Comment
01	Read multiple coils Read digital inputs	Discrete bits are read from a specified bit address. The number of bits is variable.
02	Read multiple input	Discrete bits are read from a specified input address. The number of bits is variable.
03	Read multiple holding registers	Single or multiple data words are read from a specified data word address. The number of data words is variable.
04	Read multiple input registers	Single or multiple data words are read from a specified data word address. The number of data words is variable.
05	Write single coil Set digital output	A single bit is set or reset.
06	Write single holding register	A single data word is written.
15	Write multiple coils Set digital outputs	Several bits are written from a specified bit address. The number of bits is variable.
16	Write multiple holding registers	Several data words are written from a specified data word address. The number of data words is variable.

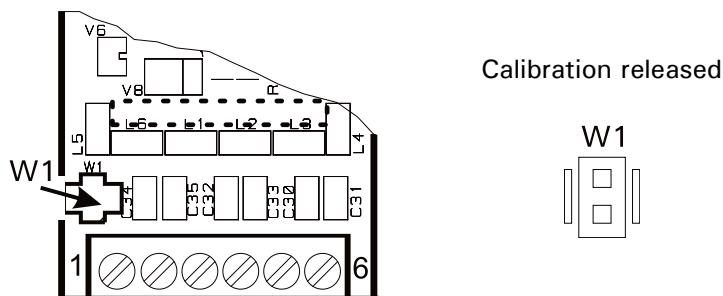
7 Calibration Mode

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
- IS-Platforms Calibration Manual, order No.: ST.2309.0113
- DigiTOL-Box Installation Instructions, order No.: ST.2309.1173

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



In Service Mode call up group 'Calibration'.

Calibrate Scale 1	<input type="button" value="↶"/> <input type="button" value="↷"/>	Choose any of the installed scales
	<input type="button" value="↶"/>	

If jumper W1 is still in place:

Calibration Locked	Warning: jumper not in calibration position, parameters cannot be saved!
	<input type="button" value="↶"/> 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

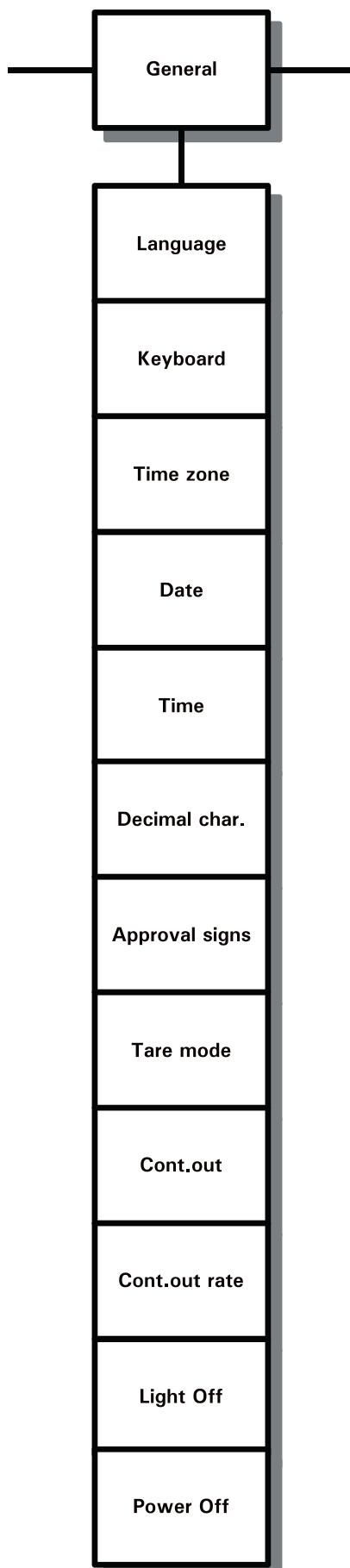
or scrolling

If jumper W1 on ADM module is still in place:

Error Calibr. Jumper	Error message: jumper not in calibration position, parameters cannot be saved!
	<input type="button" value="↶"/> Exit calibration without saving

8 Entry Of Parameters (General)

Choose group 'General' from Service Mode menu.



Language : German



Select language:

- German
- English

Others depending on application program.

All languages except German:

Keyboard : US



USB keyboard layout:

- US: US layout
- GB: British 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
- With 'Etc' a time difference to GMT can be chosen.
Automatic summer / winter time switching is made in accordance with the chosen time zone.

Time Zone : Dublin



For some entries the particular location must be specified, e.g. 'Dublin'.

! ATTENTION

- After changing the time zone, current time must be entered under menu item 'Settings' (see operation manual 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 time:

- HH:MM
- HH:MM:SS

H = hour M = minute S = second

Country Code : XX

Country code of country of installation (required for compliance with locally applicable W&M regulations).

2-character code following ISO-3166-2, e.g.:

- DE Germany
- GB Great Britain
- CA Canada
- NL Netherlands

Note: Parameter protected with jumper.

Decimal char.: Dot 

Select character to separate decimals:

- Dot (e.g. 0.00)
- Comma (e.g. 0,00)

Note: Parameter protected with jumper.

Approval signs: N 

Select approval signs:

- Y: 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: 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

Note: Parameter protected with jumper.

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:

- SysTec SysTec format
- Flintec Flintec format
- Customized Freely defined format
- Sys.Remote IT1 Remote Display
- Toledo TOLEDO® format
- Schauf Schauf format
- CAS CAS format
- GS Gebhardt&Schaefer protocol with support of traffic light function
- SPEC1 Customized format
- MT-SICS MT-SICS protocol
- SPEC2 Customized format
- 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:

- Eth, SIM1–SIMx

Eth chosen:**Cont.out port:** 99999

TCP/IP port for the external connection. Default: 1900

Cont.out rate: 99

Entry of number of updates per second for the continuous output.

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 backlighting 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).

Serial No 9999999999

Entry of 10-digit serial No. of device.

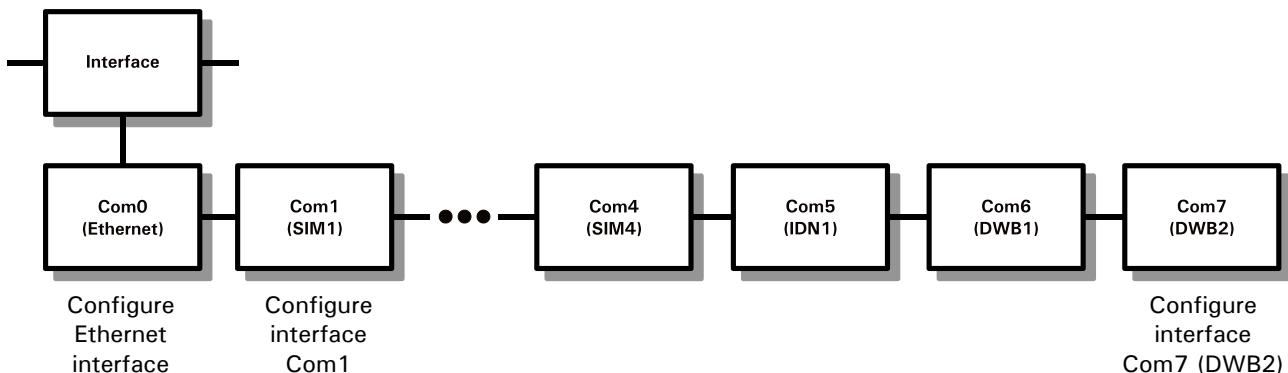
Must be identical to number printed on nameplate.

Required for Ethernet data transmission and approvals.

Note: Parameter protected with jumper.

9 Interface Configuration

Choose group 'Interface' from Service Mode menu.



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

9.1 Configuration of Ethernet interface

Interface Com0 (Eth)



Com0: Port 99999

Enter port

Com0: Protocol None



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: Codepage None



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'
- Star DOS Codepage Star printers

Tab ESC/P



Select mode of horizontal alignment for the print fields:

- ESC/P Horizontal alignment with tab function according to ESC/P® protocol
- Spaces Horizontal alignment by insertion of spaces

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: Checksum None



Select method to calculate the checksum which is transmitted behind the end character:

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

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

Com0:With Start N



The start character is included in the checksum calculation

Com0:With End N



The end character is included in the checksum calculation

9.2 Configuration of serial interfaces

Interface Com1 (SIM1)



Continue with interface Com1

Com1: 9600 Baud



Select baud rate of Com1:

- 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200

Com1: 8 Databits



Select data format for serial interface Com1:

- 7 data bits, 8 data bits.

Always 1 stop bit is transmitted.

Com1: No Parity



Select parity for interface Com1:

- None
- Even
- Odd

Com1: No Control



Select hardware handshake for interface Com1:

- XOn/XOff
- RTS/CTS
- None no transmission control

Note: RTS/CTS not possible on Com2!

Com1: No Protocol



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: Codepage None



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'
- Star DOS Codepage Star printers

Tab

ESC/P



Select mode of horizontal alignment for the print fields:

- ESC/P Horizontal alignment with tab function according to ESC/P® protocol
- Spaces Horizontal alignment by insertion of spaces

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: Checksum None



Select method to calculate the checksum which is transmitted behind the end character:

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

If a start or end character was specified 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.

9.3 Configuration for PC ReadIT

9.3.1 Using Ethernet

Interface Com0 (Eth) 

Com0: Port 1234 Enter port 1234

Com0:Protocol AckNak   Select protocol of Com0:
• AckNak ACK / NAK procedure with confirmation

Com0: Start char. 2 Entry of start character as decimal value (2 = STX)

Com0: End char. 3 Entry of end character as decimal value (3 = ETX)

Com0: Checksum XOR   Select method to calculate the checksum which is transmitted behind the end character:
• XOR Exclusive-Or checksum

Com0: With start N **N** The start character is not included in the checksum calculation

Com0: With end Y **Y** The end character is included in the checksum calculation

9.3.2 Serial

Interface Com1 (SIM1) 

Com1: Baud 9600 

Select baud rate of Com1:

- 300, 600, 1200, 2400, 4800, 9600, 19200,
38400, 57600, 115200

Suitable for host

Com1: Databits 8 

Select data format for serial interface Com1:

- 7 data bits, 8 data bits.

Always 1 stop bit is transmitted.

Suitable for host

Com1: Parity None 

Select parity for interface Com1:

- None
- Even
- Odd

Suitable for host

Com1: Ctrl. None 

Select hardware handshake for interface Com1:

- XOn/XOff
- RTS/CTS
- None no transmission control

Note: RTS/CTS not possible on Com2!

Suitable for host

Com1: Protcl. AckNak 

Select protocol of Com1:

- AckNak ACK / NAK procedure with confirmation

Com1: Start char. 2

Entry of start character as decimal value (2 = STX)

Com1: End char. 3

Entry of end character as decimal value (3 = ETX)

Com1: Checksum XOR 

Select method to calculate the checksum which is transmitted behind the end character:

- XOR Exclusive-Or checksum

Com1: With start N

N

The start character is not included in the checksum calculation

Com1: With end Y

Y

The end character is included in the checksum calculation

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 the first IP address for the local net: Note: The weighing terminal does not support DHCP and requires a permanent IP address.
		Entry of a second IP address
Mask	255.255.0.0	Entry of subnet mask of the first IP address
Entry of a second IP address:		
2.IP	192.168.178.13	Entry of a second IP address for another local network that is independent of the first. (E.g. for network participants belonging only to this installation.)
2.Mask	255.255.0.0	Entry of subnet mask of the second IP address
Gate	0.0.0.0	Entry of gateway
DNS:	10.0.1.3	Entry of DNS server
NTP:	192.53.103.108	Entry of NTP server for time synchronization, this requires entry of time zone. Applicable only if time zones are supported by the firmware.
Example for ptbtime1.ptb.de		
FTP pwd:	9999999	Entry of password for FTP access to the shared directory. <ul style="list-style-type: none"> • Shared directory: User 'shared' • USB device: User 'usbshared'
Web Access	Off  	Enable / disable access to data via web browser.
For a description of SysTec Web Interface refer to:		
<ul style="list-style-type: none"> • Web Interface Operation Manual, order No.: ST.2309.1692 		
Web Access = On		
Web pwd:	9999999	Specify administrator password
Access No.	999	Max. number of users who may be logged in at the same time.
Web-App login	Y	Allows access via a web application.
Update SSL cert	No	Yes: Creation of a certificate and storage in the FTP folder.

Start auto ping Y

Start sending ICMP packages to the gateway.

Note: In some networks ARP broadcast may be disabled which can lead to problems with the communication between WLAN controller and the module. In this case, sending an ICMP package to the network gateway at regular intervals can rectify the problem. The effect is that the IP address and the hardware address are entered in the controller. Since the controller discards this information after a few minutes, it is required to send the package at regular intervals. When 'Auto Ping' is enabled, an ICMP package is sent every 60 seconds.

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: IT8000ET_001, IT8000ET_123

Rem. Display Token Y



Y: Entry of a Remote Display Token for PC *ScaleView*.



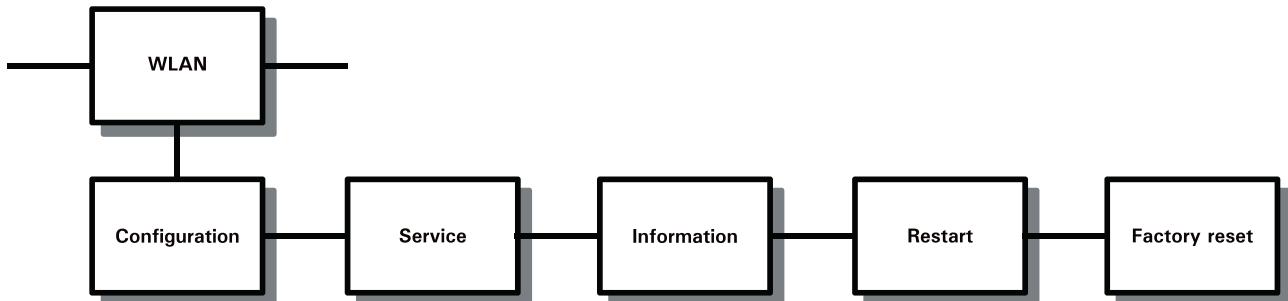
Confirm

For a detailed description refer to:

- PC *ScaleView* Operation Manual, order No. ST.2309.1817

11 WLAN

Choose Service Mode group 'WLAN'.



For a description of WLAN settings refer to:

- WLX Installation Instructions, order No. ST.2309.1590

12 Licenses

Choose group 'Licenses' from Service Mode menu.

A license key is needed to connect a terminal with a PC or mobile device via PC *ScaleView*.

PC ScaleView 1X inv

Display: License for the connection of 1 device not activated

PC ScaleView 1X inv



Select type of license:

- 1X: Allows the connection of 1 device
- 2X: Allows the connection of 2 devices



Code: 99-99999-99999-

Enter license code



Code is ok

Message: License key is valid

PC ScaleView 1X val

Display: License for the connection of 1 device activated

License key invalid

Invalid Code

For a detailed description refer to:

- PC *ScaleView* Operation Manual, order No. ST.2309.1817

13 Backup

Choose group 'Backup' from Service Mode menu.

This menu provides functions to save and restore data of the weighing terminal using a USB memory stick.

Insert the formatted USB stick into the USB socket. The USB stick has to be formatted in FAT32.

Backup:	Backup		<ul style="list-style-type: none"> • Backup: Save data • Restore: Restore data

13.1 Backup data

Backup:	Backup		
Name:	9-99-99_99-99		Display of backup file name consisting of date and time of backup.

Performing backup and system rebooting. The weighing terminal starts with basic step.

13.2 Restore data

Backup:	Restore		
Backup	9999-99-99_99		Display of the first backup file.
Backup	9999-99-99_99		Select backup file.

Performing restore and system rebooting. The weighing terminal starts with basic step.

Error USB stick	
No USB stick.	No USB stick present or stick not formatted correctly.

14 Test

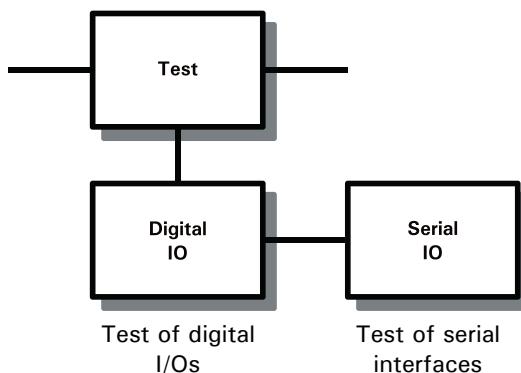


W A R N I N G

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.



14.1 Test Of Digital Inputs/Outputs

Test: Digital IO



G1: 00000010 00000001

Status information 0 or 1 for the first I/O group.
Inputs are shown on the left, outputs on the right hand side. (1 = input/output 'on').

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

G2 2



Continue with next I/O group (if applicable).

14.2 Test Of Serial Interfaces

Test: Digital IO 

Test: Serial IO 

Com1: not ok

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 20 mA interfaces is
not possible.

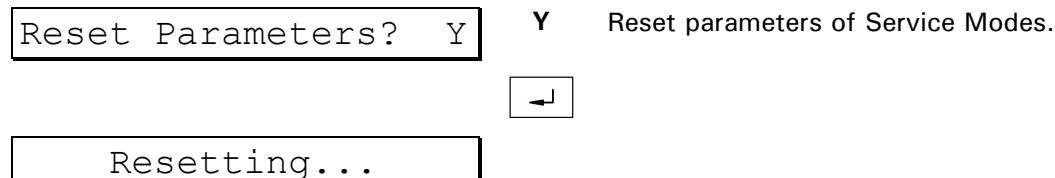
Com2: not ok  Continue with next interface.

15 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.

15.1 Reset Parameters



Group	Setting	Setting
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
Config. Analog out	AOut 1: None	
Config. Analog in	AIn 1: None	
Configuration Fieldbus	Fieldbus: Off	

15.2 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	Delete W&M approved data archive
<input type="button" value="→"/>		
Storage	Intern	<input checked="" type="radio"/> <input type="radio"/> Chose storage type:
		<ul style="list-style-type: none">Intern Internal storageExtended USB memory stick 19OPT601, connected on CPU board.
<input type="button" value="→"/>		
Type	Date+Id	<input checked="" type="radio"/> <input type="radio"/> Create W&M approved data archive
		<ul style="list-style-type: none">Date +Id With Date and Ident number (4 digits)Cons.Id With consecutive number (6 digits)
<input type="button" value="→"/>		
Reset now ?	Y	<input checked="" type="radio"/> <input type="radio"/> • Y Reset • N Cancel
<input type="button" value="Resetting ..."/>		
Service: Reset		

16 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.



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

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.

17 Continuous Output (Cont.out)

The interfaces Ethernet (COM0), COM1–COMx can be configured as continuous output, one of several protocols can be chosen in group 'General' of the Service Mode.

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

17.1 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. Characters not used are filled with space characters.

Example:

'12345678901234567'	Characters:
	1. char.: Start character always S
's 10.98 t c _R L _F '	2. char.: Status ⊂ (space) = scale settled
'SD 10980 kg c _R L _F '	D = scale in motion
	3.–12. char. weight 10 characters, in the format of the scale calibration
	13. char. always ⊂ (space)
	14.–15. char. weight unit
	16.–17. char. CR and LF

17.2 SysTec Remote Protocol

This data string is used to connect an IT1 remote display with extended functions.

The operating mode 'Remote Display' must be chosen in the configuration of the IT1 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.

'123456789012345'	Characters:
' 100.0 kg N c _R L _F '	1. char.: Status ~ = scale in motion ° = scale settled 1, 2, 3 = weighing range
	2.–9. char. weight 8 characters, in the format of the scale calibration
	10. char. always ⊂ (space)
	11.–12. char. weight unit
	13. char. N = net weight ⊂ (space) = gross weight
	14.–15. char. CR and LF

17.3 Customized Protocol

The data string can be freely defined. In the table below **x** and **y** are wild cards. If the condition is true, the character specified under **x** is transmitted. If the condition is false, the character specified under **y** is transmitted instead.

If you want – for instance – to send the character **~** when the scale is in motion, the corresponding string is **M~:R** (condition = true). If the condition is false, character **R** is sent instead.

The entry of a colon followed by a character **y** is optional. In this case, a space character is transmitted if condition = false.

Weights are transmitted as shown on the display including decimal separator.

Non-significant (leading) weight digits are transmitted as space.

String	Transmission	Example
Mx:y	Transmits the character specified under x , when the scale is in motion , e.g.: ~ , else transmits the character specified under y	M~:R
mx:y	Transmits the character specified under x , when the scale is settled , e.g.: R , else transmits the character specified under y	mR:~
Ox:y	Transmits the character specified under x , when the scale is in overload , e.g.: U , else transmits the character specified under y	OU:N
ox:y	Transmits the character specified under x , when the scale is not in overload , e.g.: N , else transmits the character specified under y	oN:U
Zx:y	Transmits the character specified under x , when the scale is in zero range , e.g.: N , else transmits the character specified under y	ZN:A
zx:y	Transmits the character specified under x , when the scale is not in zero range , e.g.: A , else transmits the character specified under y	zA:N
Px:y	Transmits the character specified under x , when the scale is tared , e.g.: T , else transmits the character specified under y	PT:N
px:y	Transmits the character specified under x , when the scale is not tared , e.g.: N , else transmits the character specified under y	pN:T
[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
Cx	Transmits the number of pieces with x digits, e.g.: 6 . When the next letter is U , either the net weight or number of pieces will be transmitted.	C6
U	Transmits the unit of calibration , e.g.: 'kg' , 't' , 'g ' , 'lb'	U
R	Transmits the weighing range , space for single range scales	R
123	Transmits a specified character (3-digit decimal code)	002=STX
S	Special character from application, for example traffic light control ('TRUCK' only).	S

Example for a data string to control a remote display with motion / no-motion and gross / net indication.

083	MM:S	PN:G	N8	U	013	010
						LF
					CR	
			Unit			
			Net weight, 8 characters			
				When scale is tared 'N' (net), otherwise 'G' (gross)		
				When scale in motion 'M' (motion), otherwise 'S' (stable)		
				Fixed 'S'		

Extended Standard Protocol

The data string with the option to transmit status information consists of 18 ASCII characters plus CR and LF. It includes information on weighing range, gross/net, no-motion/motion, scale in zero as well as the weight and the unit sign. Characters not used are replaced with space characters.

Example string: '088087RPN:GMM:SZZ N9 U013010'

Char.: '123456789012345678901'

- 1 |_____ Fixed 'X' (ASCII code 088) as start character
- 2 |_____ Fixed character 'W' (ASCII code 087) as marker for 'weight data string' or 'D' for 'general data' (reserved for future extension)
- 3 |_____ Weighing range '1', '2' etc. or space for single-range scale
- 4 |_____ 'N' for net weight, 'G' for gross weight
- 5 |_____ 'M' for scale in motion or 'S' for scale settled
- 6 |_____ 'Z' when scale in zero range, otherwise space character
- 7 |_____ 'S' for traffic light function
- 8 |_____ | Weight, 9 characters, right justified, with preceding minus sign and decimal separator, if applicable
- 17 |_____ Fixed space character between weight and unit
- 18 |_| Weight unit 'kg', 'g', 't' or 'lb' (others if applicable), 2 characters, left justified
- 20 |_| <CR> (carriage return)
- 21 |_| <LF> (line feed)

Examples:

Char.: '123456789012345678901'

- 'XW NS 1371,5 kg^{C_{R,L}F}' Net weight, scale settled,
- 'XW GSZ 0,0 kg^{C_{R,L}F}' Gross weight, scale in zero and settled,
- 'XW2GS 21380 t^{C_{R,L}F}' Gross weight, scale in second weighing range and settled,
- 'XW NM -1,35 kg^{C_{R,L}F}' Net weight, scale in motion and weight negative.

17.4 CAS Protocol

The data string to transmit the weight consists of the 4-character status word, 6 ASCII characters for the weight, 1 separator, the 2-character unit sign plus CR and LF. Example:

'123456789012345678901'	Characters:	
'ST,NT,X,- 10.95 kg ^c _R F'	1. char.: Status	ST = scale stable US = scale in motion OL = overload
	3. char.	separator (comma)
	4.-5. char.	NT = net
	6. char.	separator (comma)
	7. char.: Status bits	'76543210' (Bit) '11000110'
	Bit 7	always 1
	Bit 6	0 = scale in motion 1 = scale stable (settled)
	Bit 5-3	always 0
	Bit 2	0 = scale tared 1 = scale not tared
	Bit 1	0 = net weight 1 = gross weight
	Bit 0	always 0
	8. char.	separator (comma)
	9. char.	- = weight negative = (space) = weight positive
	10.-16. char.	weight 7 characters, in format of scale calibration
	17. char.	separator = = (space)
	18.-19. char.	weight unit
	20.-21. char.	CR and LF

17.5 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:

'123456789'	Characters:	
'@ 10.98 ^c _R '	1. char.	always @ (Hex 40)
	9. char.	always CR (Hex D)
non-significant characters are filled with space (Hex 20).		

17.6 GS Protocol (Gebhardt & Schäfer With Traffic Light Function)

The data string to control the remote display consists of 15 ASCII characters plus CR and LF. It contains a status character for motion / no-motion, the color of the traffic light, the net weight and the unit sign. Characters not used are filled with space characters. Example:

'12345678901234567'	Characters:	
	1. char.: Start character	always S
'S 0 10.98 t c _{RLF} '	2. char.: Status	(space) = scale settled
'SD 0 10980 kg c _{RLF} '		D = scale in motion
	3.-5. char.	(space)
	6. char.: Traffic light	0 = off 1 = red 2 = green 3 = red + green
	7.-12. char.	weight, 6 characters, in format of scale calibration
	13. char.	always (space)
	14.-15. char.	weight unit
	16.-17. char.	CR and LF

17.7 MT-SICS Protocol

The data string to control a remote display consists of 17 ASCII characters plus CR and LF. It contains the motion / no-motion status, the net weight and the unit sign. Characters not used are filled with space characters. Example:

'1234567890123456789'	Characters:	
	1. char.: Start character	always S
	2. char.	(space)
'S S 10.98 t CRLF'	3. char.: Status	S = scale settled
'S D 10980 kg c _{RLF} '		D = scale in motion
	4. char.	(space)
	5.-14. char.	weight, 10 characters, in format of scale calibration
	15. char.	(space)
	16.-17. char.	weight unit
	18.-19. char.	CR and LF

17.8 Schauf Protocol

The data string to control a Schauf remote display consists of 10 ASCII characters. Example:

'1234567890'	Characters:
'<ESC>!'" 100.0 ^{c_R} '	1. char. always [ESC] (Hex 1B)
	2. char. always ! character [33] (Hex 21)
	3. char. always " character [34] (Hex 22)
	4.-9. char. weight, 5 characters, in format of scale calibration
	10. char. always CR character [13] (Hex 0D)

17.9 SPEC1 Protocol

The data string to control a remote display consists of 22 characters plus CR and LF. It contains net weight, tare weight, unit code and status information. Characters not used are filled with space characters. Example:

'123456789012345678901234'	Characters:
's _x 123456 100000 XY ^{c_R F} '	1. char. always <STX> Hex 02
	2. char. always ↵ (space)
	3.-10. char. net weight, 8 characters, no decimal separator
	11. char. always ↵ (space)
	12.-19. char. tare weight, 8 characters, no decimal separator
	20. char. always ↵ (space)
	21. char.: Status bits '76543210' (bit) '00001001' Bit 7-4 always 0 Bit 3 0 = scale tared 1 = scale not tared Bit 2 0 = scale in zero range 1 = scale not in zero range Bit 1 0 = scale in motion 1 = scale settled Bit 0 always 1
	22. char.: code for weight unit 00000000 – kg 00000001 – g 00000011 – t
	23.-24. char. CR and LF

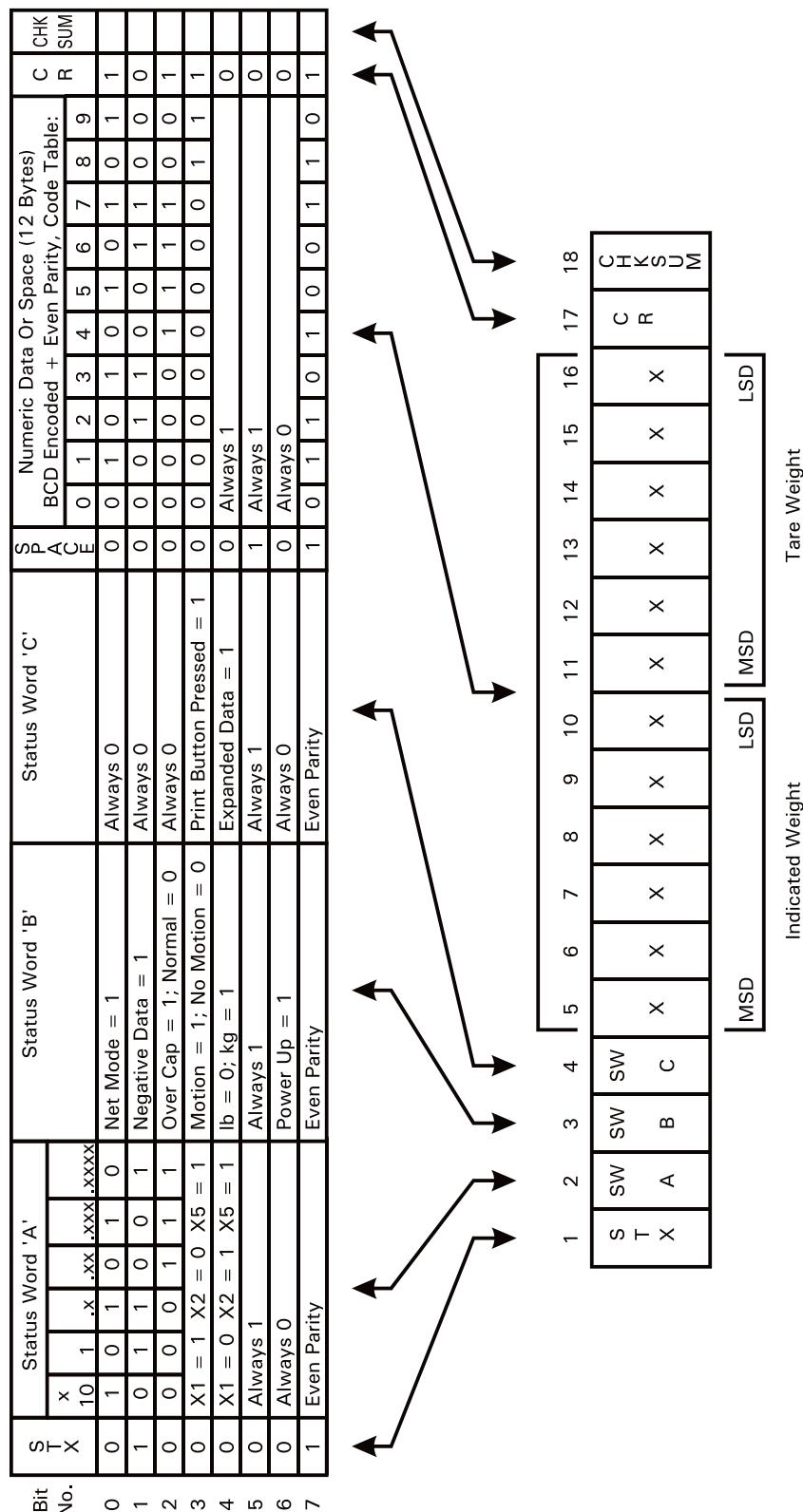
17.10 SPEC2 Protocol

The data string for transmission of weight consists of the 2-character status information, 5 ASCII characters for the weight, 1 separator, 2-character unit sign plus CR and LF. Example:

'123456789012345'	Characters:
's_x- 10095KNM ^C _R ^L _F '	
1. char.	always <STX> Hex 02
2. char.: Prefix	- = weight negative □ (space) = weight positive
3.-4. char.	always □ (space)
5.-10. char.	weight 5 characters, in format of scale calibration
11. char.: Unit	K = kg L = lb
12. char.: Mode	G = gross weight N = net weight
13. char.: Status	M = scale in motion □ (space) = scale settled
14.-15. char.	CR and LF

17.11 TOLEDO® Protocol

The data string emulates the essential functions of the Continuous Mode as it is output by digital indicators of the series TOLEDO® 8132, 8140, 8142, 8520, 8530 etc.



Transmission parameters are: 4800 baud, 7 data bits, even parity, no hardware handshake. Checksum is defined as the 2's complement of the 7 low order bits of the binary sum of the 7 low order bits of all characters preceding the checksum including STX and CR. Bit 8 of the checksum is parity over the 7 low order bits of checksum.

18 Transport, Maintenance And Cleaning

18.1 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.

18.2 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.

18.3 Cleaning

! CAUTION

- Disconnect all power to this unit before servicing!

! CAUTION

- Concentrated leaches or acids, solvents, pure alcohol, chloric or saline cleaning agents must not be used.

The keyboard overlay is resistant to acetone, trichloro, alcohol, ether, nitric acid (20 %), hexane, sulphuric acid (20 %) and all-purpose cleaners.

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.

If cleaning agents are used that contain leach, acid or alcohol, pure water must be used to wash off any residue.

18.4 Replacing The Battery

! CAUTION

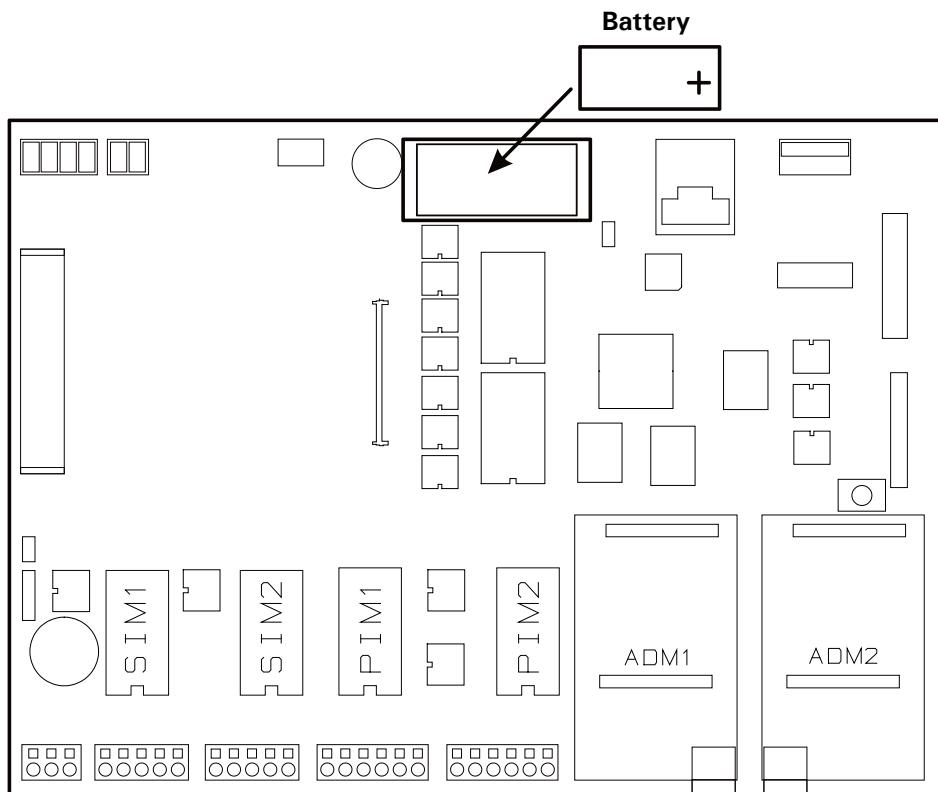
- For the storage of data the weighing terminal contains a lithium battery. Risk of explosion if battery is replaced improperly! Replace only with battery of the same type or with compatible type recommended by manufacturer. Disposal of used batteries only as indicated by manufacturer.

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!

18.5 Calibration Of Display

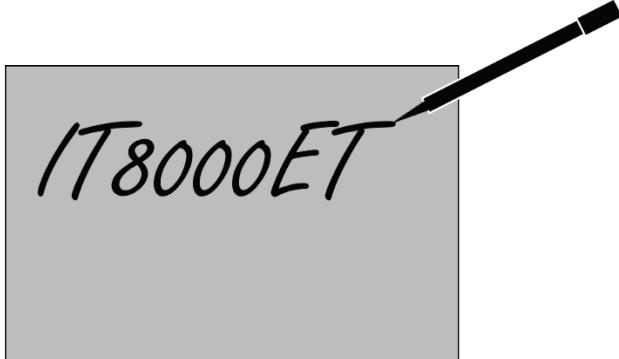
ATTENTION

- To calibrate the display use only suitable touch panel pen and press very carefully only. Other sharp or pointed objects may scratch and damage the display.

- The weighing terminal is powered up and running.
- To access calibration press 'On/Off switch' for approx. 20 sec.  Ignore the messages 'Power off is disabled' and 'Power off in 5 seconds'.
- When the message 'Screen calibration is started after key release' appears the unit is ready for calibration.
- Release the 'On/Off switch'.
- In the upper left corner of the display a marking grid appears.



- Now use a suitable touch pen and touch the center of the grid at the 5 positions to which it moves over the screen during the calibration.
- The display turns black, calibration is done.
- In the test mode draw with a suitable touch pen on the display. Calibration is correct when the image on the display follows exactly the position of the pen, if not, calibration must be repeated.



- Touch any point on the display twice to terminate test mode.

19 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:

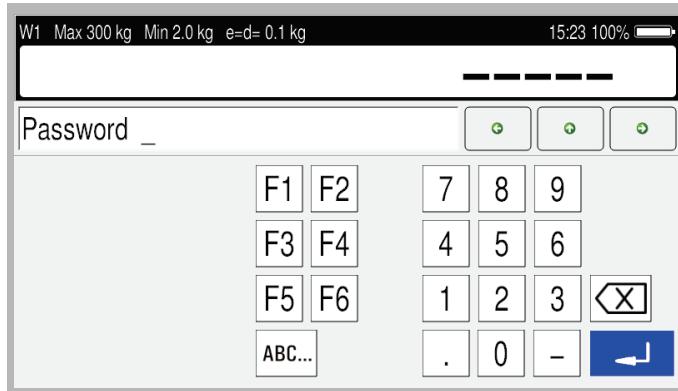
- Serial No. of the unit and its peripheral components
- Program version as displayed on power up
- Exact wording of any error message displayed
- Type and model of peripheral devices related to the problem (e.g. scale, printer, etc.)

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.

19.1 Error Log Of Scale



Calibrate Scale 1 **F1** View error log of scale

06.06.12 08:52 Ok **<** **>** Selection

06.06.12 08:52 Ok **F1** Return to 'Calibrate Scale 1'

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
E33	Other error message 33
66	Service Mode active

19.2 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	<ul style="list-style-type: none"> Jumper for protection of calibration parameters in position 'protected' 	<ul style="list-style-type: none"> Set calibration jumper to calibration position
Error Calibr. Jumper	<ul style="list-style-type: none"> Parameters cannot be saved, jumper in wrong position 	<ul style="list-style-type: none"> Set jumper to correct position, repeat calibration
ADM not installed	<ul style="list-style-type: none"> No A/D converter installed 	<ul style="list-style-type: none"> Check A/D converter
Not Available	<ul style="list-style-type: none"> No scale selected 	<ul style="list-style-type: none"> Check parameters in Service Mode
ADM Defect	<ul style="list-style-type: none"> No data received from A/D converter Short circuit in load cell cable 	<ul style="list-style-type: none"> Replace A/D converter Check cabling
Resolution Error	<ul style="list-style-type: none"> Internal resolution too small, must be at least tenfold the displayed resolution 	<ul style="list-style-type: none"> Select bigger increment size Use load cell with lower capacity
Out Of Range	<p>A/D converter overrange:</p> <ul style="list-style-type: none"> Wiring error load cell Load cell defective Scale heavily overloaded 	<ul style="list-style-type: none"> Check wiring Check load cell Unload scale

Error Message	Possible Cause	Corrective Measure
Overload	<ul style="list-style-type: none"> Scale in overload 	<ul style="list-style-type: none"> Unload scale
-----	<ul style="list-style-type: none"> Setting to zero or taring impossible because of scale in motion CPU does not receive data from weighing interface 	<ul style="list-style-type: none"> Settle scale Check internal and external wiring and cabling
Powerup Out of Range	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> Unload scale or apply dead load
Powerup Motion	<ul style="list-style-type: none"> This message appears on power up if the terminal cannot detect a settled weight within the specified power up zero range ($\pm 2\%$, $\pm 10\%$). 	<ul style="list-style-type: none"> Settle scale
Error Transmission	<ul style="list-style-type: none"> Host switched off or offline, data cable not connected or damaged 	<ul style="list-style-type: none"> Switch on host and start communication program Check cable and connectors If problem cannot be rectified, disable data transmission

20 Technical Data

20.1 IT8000ET

Housing	Stainless steel wall/desk housing, protected to IP65, weight approx. 4.2 kg 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 : 12 V (-15 %) – 30 V (+10 %) DC Rated Current I_N : 2.2–0.6 A
Display	Active touch sensitive color TFT, size 152 x 91 mm (7"), 800 x 480 pixel
Processor	32-bit ARM processor, 266 MHz Linux operating system
Scale Interface Module	ADM to connect analog load cells in 4- or 6-wire mode; W&M approved resolution of 6000 divisions 50–400 updates / second Overall impedance of connected load cells: 43–4500 Ω DWB to connect to digital load cells with RS485 interface, IDN to connect to Mettler-Toledo 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:

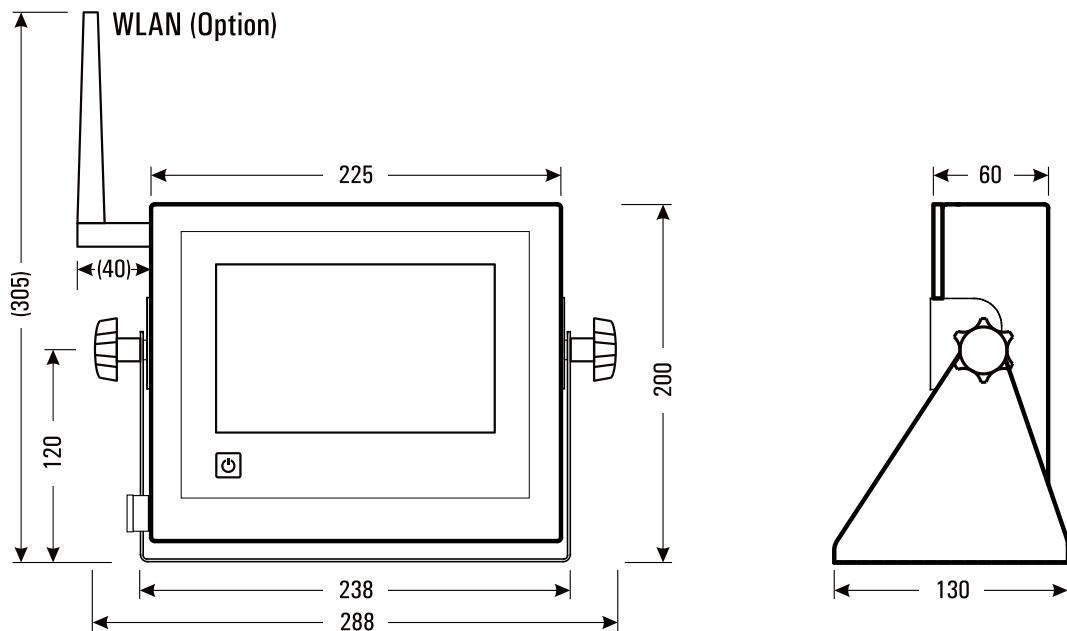
Serial Interface Modules 2 x SIM	SIM-RS232, SIM-RS485-4-wire, SIM-RS485-OPTO, SIM-20mA (only passive / passive), DUAL-ISM
Digital I/O Modules 2 x PIM	2 optoisolated digital inputs (12–24 VDC / 7 mA) 2 optoisolated digital outputs (12–24 VDC / 100 mA)
Analog Output Module 2 x DAU	1 analog output related 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 0–20 mA, 4–20 mA, 0–10 V, 2–10 V selectable
Ethernet/IP Extension Module, 1 x ETX	ETX Ethernet/IP Interface 10 MBit/s, 100 MBit/s
PROFINET Extension Module, 1 x PNX	PNX PROFINET Interface 10 MBit/s, 100 MBit/s
Profibus DP Extension Module, 1 x PBX	PBX Profibus DP Interface 12 MBit
I/O Extension Module 1 x SPU	2 sockets for serial interface modules (SIM) 2 sockets for digital I/O modules (PIM)
WLAN Extension Module, 1xWLX	Connection to wireless local area networks

20.2 ITX000ET External Power Supply Unit

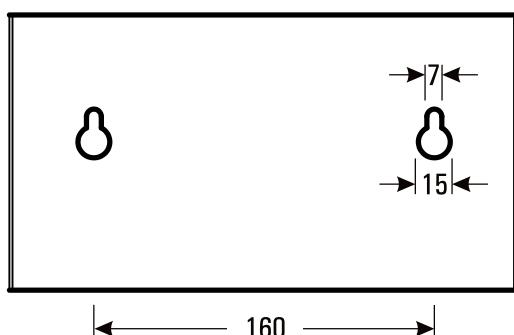
Construction	Aluminum housing for wall-mount / desk-top installation, protected to IP66, weight: approx. 1 kg
Temperature Range	Storage: -25 °C to +70 °C at 95 % relative humidity max. without condensation Operation: -10 °C to +40 °C at 95 % relative humidity max. without condensation
Input:	Input voltage: 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

21 Dimensions

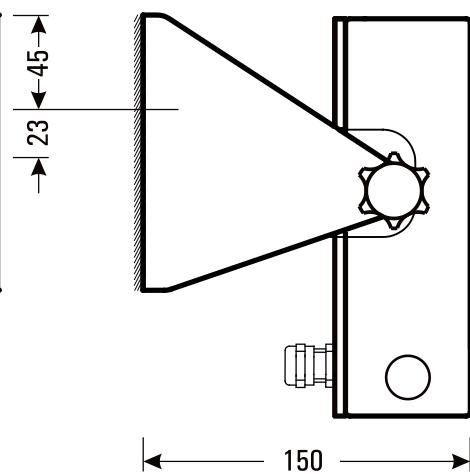
21.1 IT8000ET



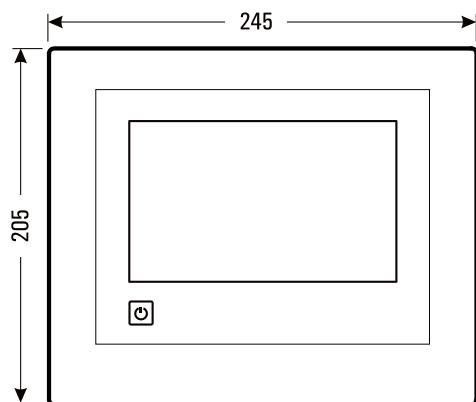
Fixing holes



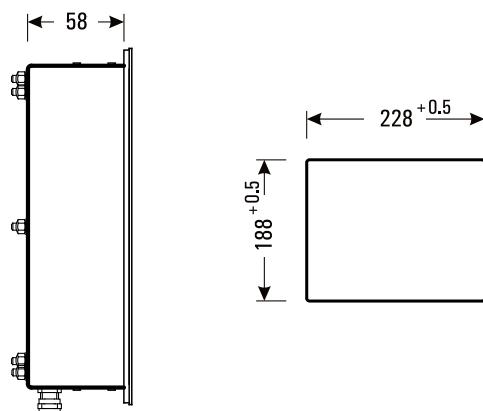
Wall-mount installation



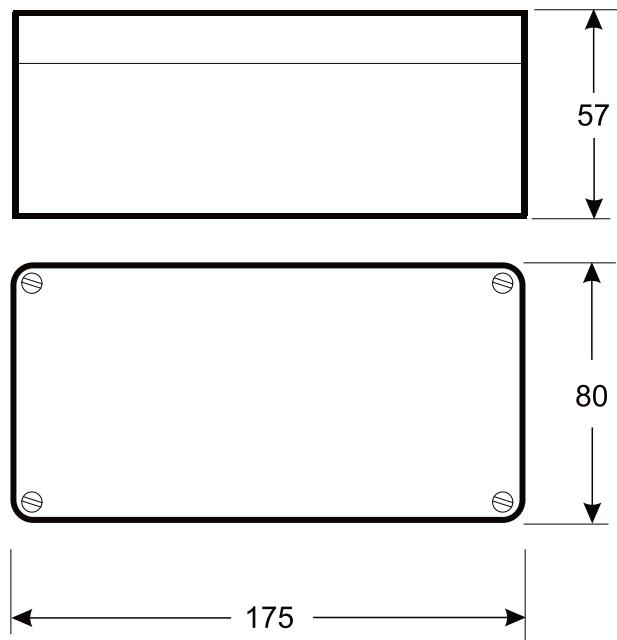
Panel-mount installation



Cutout in panel



21.2 ITX000ET External Power Supply Unit



22 Service Password

The service password is required to access the Service Mode.

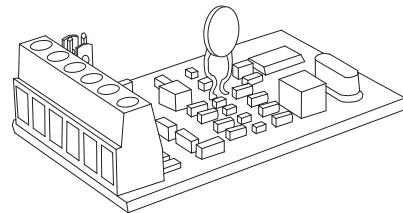
The password is: 2234

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

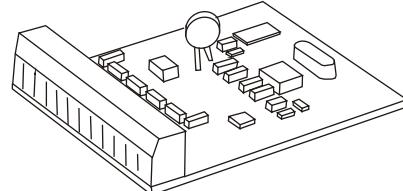
If access to the 'Settings' menu of the application program is protected by a *User Password*, also entry of the *Service Password* is accepted. This might be helpful in cases when the User Password is not available any more.

Calibration Manual

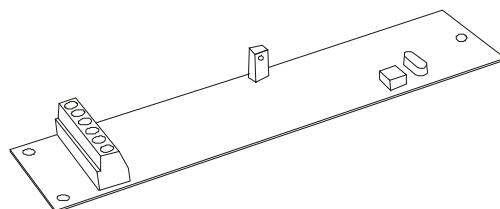
ADM:
IT3000M, IT4000E
IT6000E(T),
IT8000E(T)
IT9000E, IT8000
IT8000 Ex2/22
IT3000M Ex2/22
IT4000E Ex2/22
IT6000E Ex2/22
IT8000E Ex2/22



DUAL-ADM:
IT3000M, IT4000E
IT6000E(T)
IT3000M Ex2/22
IT4000E Ex2/22
IT6000E Ex2/22



ADM8000-Exi:
IT8000Ex



February 2016

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Rev. 20

Calibration Manual ADM / DUAL-ADM / ADM8000-Exi

Date: February 05, 2016

File: ADM_KAE.DOC

Program Version:

IT3000M, IT4000E, IT6000E(T), IT8000E(T), IT9000E	as of SCALE 2.0.0
IT8000, IT8000Ex, IT8000Ex2/22	as of RTP 8.00 and OTP CPU8000 4.00
ADCBox	as of RTP 8.00 and OTP SEM 4.00

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1 Introduction

1.1 General Description

The analog to digital converter unit **ADM** is designed to provide direct connection to scales with one strain gauge loadcell.

The analog to digital converter unit is designed to provide direct connection to scales with one strain gauge loadcell (**ADM/ADM8000-Exi**) or to scales (**DUAL-ADM**).

The parameter settings are stored in an EEPROM and can be sealed by Weights & Measures Authorities to prevent unauthorized access.

1.2 Documentation

This documentation is valid only in conjunction with the respective Technical Manual.

- IT3000M, order-No.: ST.2309.1501
- IT3000M Ex2/22, order-No.: ST.2309.1645
- IT4000E, order-No.: ST.2309.1193
- IT4000E Ex2/22, order-No.: ST.2309.1597
- IT6000E, order-No.: ST.2309.1204
- IT6000E Ex2/22, order-No.: ST.2309.1601
- IT6000ET, order-No.: ST.2309.1476
- IT8000E, order-No.: ST.2309.1188
- IT8000E Ex2/22, order-No.: ST.2309.1605
- IT8000ET, order-No.: ST.2309.1472
- IT8000, order-No.: ST.2309.0426
- IT8000Ex, order-No.: ST.2309.0851
- IT8000Ex2/22, order-No.: ST.2309.1327
- IT9000E, order-No.: ST.2309.0813

1.3 Safety Instructions

The safety instructions in the Technical Manual of the respective weighing terminal must absolutely be adhered to. This applies in particular to installations in hazardous area.

1.4 Technical Features

The terminal connects to understructures with a maximum of 16 strain gauge loadcells with an impedance of 350 W each. The loadcells may be connected to the terminal in any combination, as long as the maximum of 16 loadcells in total is not exceeded. Installation of the scale interface modules and connection to the loadcells is described in the respective Technical Manual.

For the connection of a second understructure with analog loadcells a DUAL-ADM or an additional ADM module is required (not for IT8000Ex).

Socket	IT3000M, IT4000E, IT6000E(T), IT3000M Ex2/22 IT4000E Ex2/22, IT6000E Ex2/22	IT8000E(T), IT8000E Ex2/22, IT9000E, IT8000, IT8000Ex2/22
ADM1	ADM or DUAL-ADM	1. ADM
ADM2	–	2. ADM

1.4.1 IT8000Ex Scales With Intrinsically Safe Strain Gauge Loadcell (IT8000ADM-Exi)

The IT8000Ex terminal connects to a maximum of 4 intrinsically safe strain gauge loadcells with a min. impedance of 350 W each, total impedance of loadcells 87.5 W ... 4500 W. For installation of the IT8000-Exi module and the connection of loadcells refer to Technical Manual IT8000Ex.

1.4.2 W&M Approved Applications - Scale Resolution

The W&M certified resolution (Scale Capacity / Scale Interval) is:

6000 increments with a maximum of 80% dead load.

1.4.3 Multiple-Range Scale

The A/D converter can be configured as Single-, Dual- or Triple-Range Scale. The different ranges have different capacities and scale intervals.

Example: Triple-Range Scale with a resolution of 3000 increments for each range:

First range: 0 – 1500kg / 0.5kg

Second range: 0 – 3000kg / 1.0kg

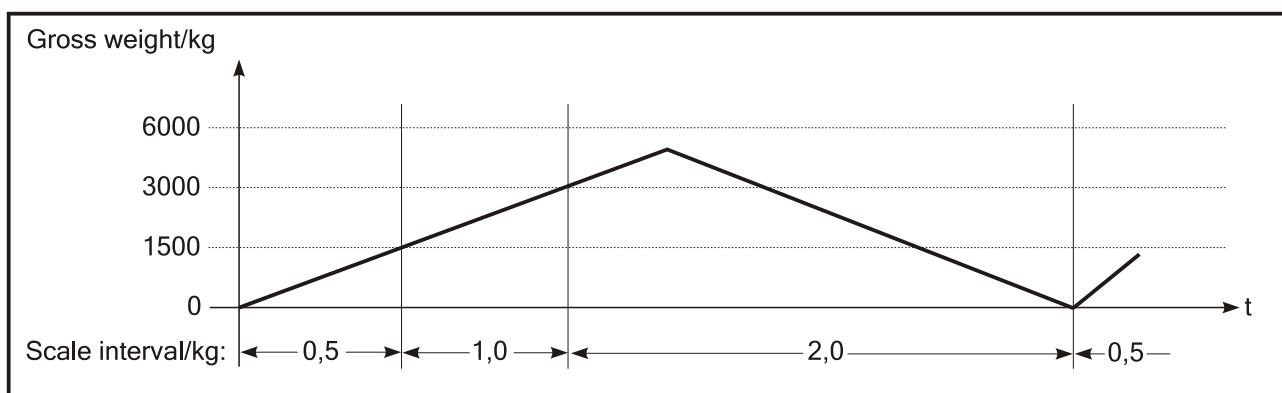
Third range: 0 – 6000kg / 2.0kg

When a Multiple-Range Scale is loaded, the scale display changes automatically from a lower to a higher range.

During unloading of the scale, the scale display remains in the higher range. If the scale was tared (weighing in net mode), on return to gross zero the tare is only cleared when the tare key is pressed. Only after clearing the tare, the display returns to gross mode and switches back to the smallest range.

Only when the scale is not tared (weighing in gross mode) the display is automatically switched back to the smallest range on return to zero.

Example of a weight curve for loading and unloading a Multiple-Range Scale showing the weight and the displayed scale interval:



When the scale is loaded further after it was tared, the tare weight is rounded automatically to the next scale interval as soon as the display is switched from one range to the next.

The Multiple-Range Scale provides weighing of light and heavy loads on the same scale with a high degree of accuracy.

Ranges and intervals can be selected freely. However, the permissible resolution of the loadcells (e.g. 3000d) must not be exceeded in any of the ranges.

1.4.4 Multi-Interval Scale

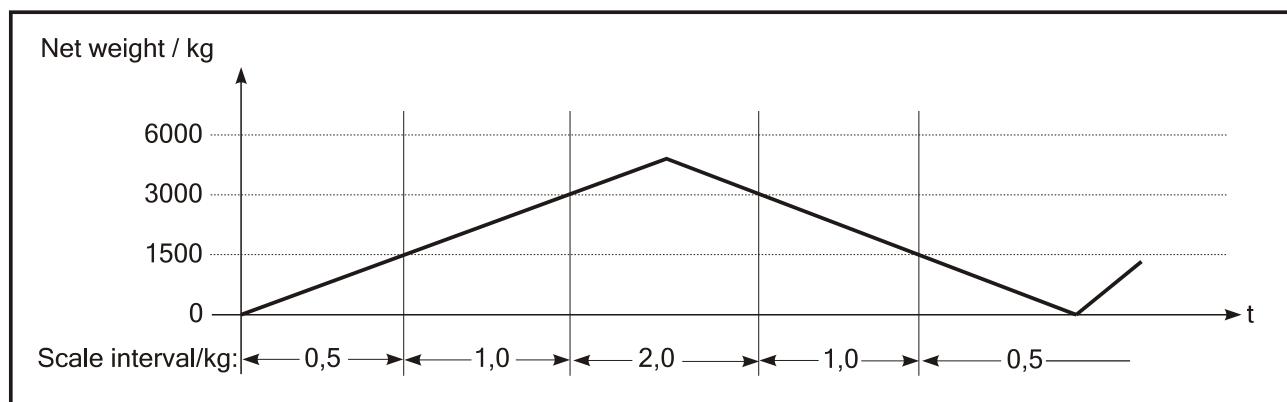
A *Single-Range Scale* can be configured as *Multi-Interval Scale* with two or three different intervals.

Example for a Triple-Interval Scale:

First interval range:	0kg	- 1500kg / 0.5kg
Second interval range:	1500kg	- 3000kg / 1.0kg
Third interval range:	3000kg	- 6000kg / 2.0kg

The scale display changes automatically from one interval range to the next during loading and unloading of the scale.

Example weight curve for loading and unloading a Multi-Interval Scale showing the weight and the scale interval displayed:



After taring the scale, the scale display shows the net weight with the smallest scale interval. Small weights are shown with the highest accuracy, even when the scale is already loaded to a higher weighing range. Restriction: The tare weight must not exceed the weight of the range with the smallest interval.

Ranges and intervals can be selected freely. However, the limitations that apply to analog loadcells for Multi-Interval Scales must be observed.

1.4.5 Summing Scale

Only for IT8000, IT8000Ex2/22, IT8000E(T), IT8000E Ex2/22, IT9000E: If two scales are connected, the combination of two A/D converters can be combined as Summing Scale. This configuration provides weight data of the individual scales and the summing scale.

Both scales must be configured with the same unit. Capacity, scale interval and overload must be set separately for the summing scale.

1.4.6 Adaptation To Scale Environment

The following parameters can be set to obtain optimum weighing results.

Motion Window / Motion Counter	Size of measurements for motion detector
Filter Size	Filter strength of the digital filter for unstable scales
Auto Zero Range	Range for auto zero tracking
Pushbutton Zero	Range for zero setting via Zero-key
Power Up Zero	Range for automatic zero setting on power up
Overload	Overload threshold for display blanking
NTEP approval?	Set measuring parameters compliant to US regulations (National Type Evaluation Program) in accordance with Handbook 44.
Underload 20d?	Blanking of weight display when gross weight smaller than -20d
Update Rate	Choose update rate for digital filtering

1.4.7 Zero And Tare Memory (IT8000 Only)

IT8000 features zero and tare memory; i.e. after power off and on, zero and tare values are restored. The zero memory is active when the parameter 'Power Up Zero' is set to 'Off', it can be disabled with the setting $\pm 2\%$ or $\pm 10\%$. In that case, however, the scale must be within power up zero range when it is switched on.

1.4.8 Calibration And Setting Of Geo Value

Before the scale is calibrated, the Geo Value must be entered, e.g. Great Britain = 21 (see also chapter Geo Values). If the scale is calibrated at one location and moved to another location later, it is sufficient to re-enter the Geo Value of the new location (only for scales that are not subject to W&M approval).

1.4.9 Weights & Measures Approved Applications

The highest W&M certified resolution (Scale Capacity / Scale Interval) is 6000 increments (with a maximum of 80% dead load).

The single capacity of each scale in a summing scale (IT8000, IT8000E(T), IT9000E only) must be equal or greater 60% of the summing scale capacity.

W&M approved installations require parameter setting in the group 'Adaptation' as follows:

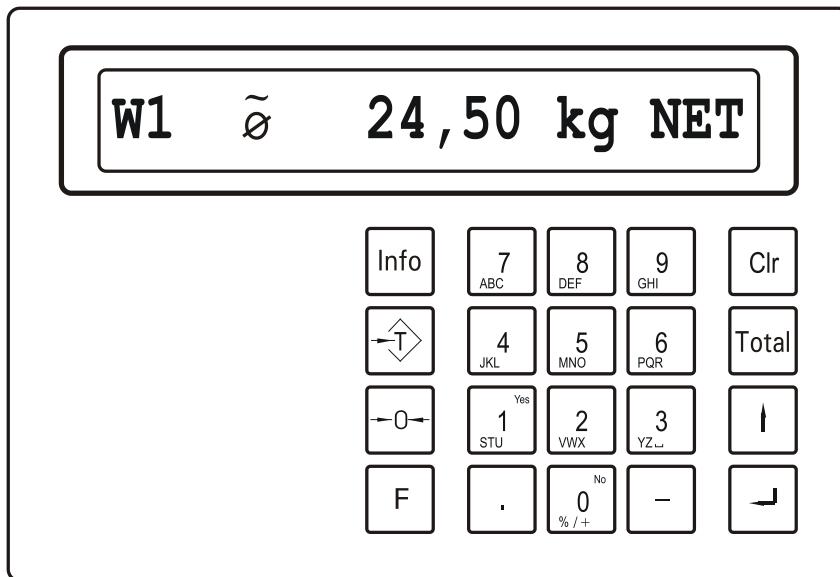
Motion Window	0.5D
Motion Counter	-
Auto Zero Range	0.5D
Pushbutton Zero	$\pm 2\%$
Power Up Zero	$\pm 2\%$ or $\pm 10\%$ *)
Overload	max. 9 D

*) Depending on the characteristics of a specific application, also the setting 'Off' may be acceptable (e.g. for hopper scales).

The scale settings are stored in an EEPROM and can be sealed by Weights & Measures to prevent unauthorized modification.

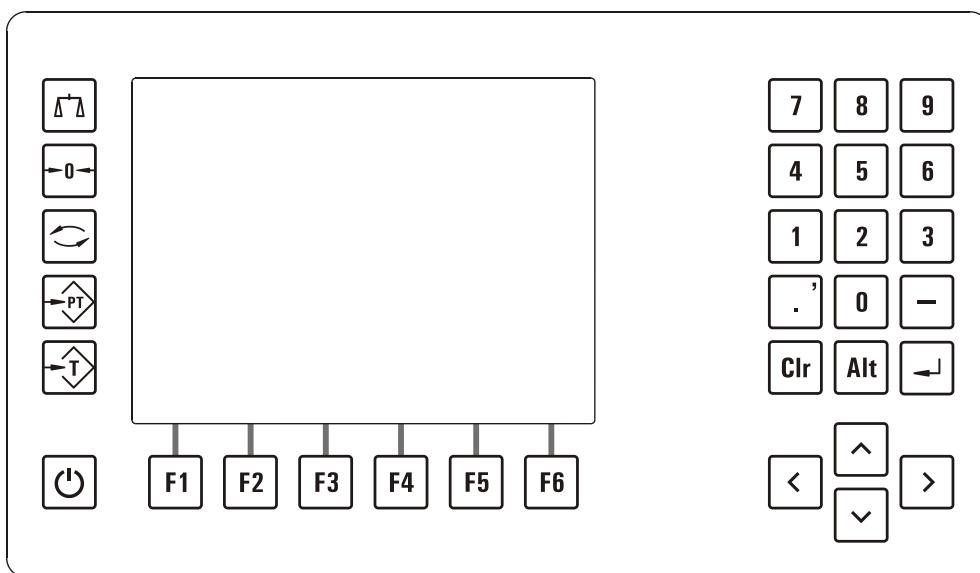
1.5 Display And Keyboard

1.5.1 IT3000M



Display line:		Gross or net weight or operator prompt and entry
	Ø	Symbol: Scale in gross zero range ($\pm 0.2d$)
	~	Symbol: Scale in motion
Info and scale keys:	Info	Scrolling forward, call up Service Mode in the initial step
	→T	Taring (Autotare), if scale is tared: clear tare
	→0←	Set gross weight to zero
Function keys:	F1 – F8	Press F-key and numeric key (1 - 8) simultaneously to access function defined in application program (see below);
	F1 / F2	Switching scale 1 < -> scale 2 when two scales are installed (in the steps defined in the application program);
	F0	Switch weight display to tenfold resolution (in the basic step of the sequence), display falls back to normal mode after approx. 5 sec.
	F-	Activate alphanumeric entries
	F.	Activate numeric entries
Special keys	Clr	Numeric entry: press key once ® clear entry Alphanumeric entry: short key stroke ® clear last character (can be repeated several times to clear more than one character); hold key down for approx. 1 sec ® clear the whole entry
	-	Return to previous program step
	↓	Confirm entry, continue with next program step
	Total	Display / print totals (if defined in the operating sequence and the printout)
Numeric keypad:		Entry of numeric data, confirmation 'Yes' (= 1) - 'No' (= 0) and entry of alpha characters via multiple key assignment

1.5.2 IT4000E (Ex2/22), IT6000E (Ex2/22), IT8000E (Ex2/22)



and	Alt Key: Pressed simultaneously with Scale-Select-key: Enter Service Mode
	Scale Select Key for switching the weight display to one of a max. of 8 scales.
	Set Zero Key to set the displayed scale to zero (only within zero setting range, selectable in calibration mode)
	Display Select Key to switch the display between tare weight / gross weight / gross bargraph / data archive
	Tare Entry Key to enter a known tare weight in the tare line, confirm with Enter- or OK-key.
	Tare Key alternately taring of currently displayed weight or clearing the tare weight
	Short key stroke ® clear last character (can be repeated several times to clear more than one character); hold key down for approx. 1 sec ® clear the whole entry
	Select menu
	Confirm entry, continue with next program step
	Return to previous program step
	Shift Key for capital letters

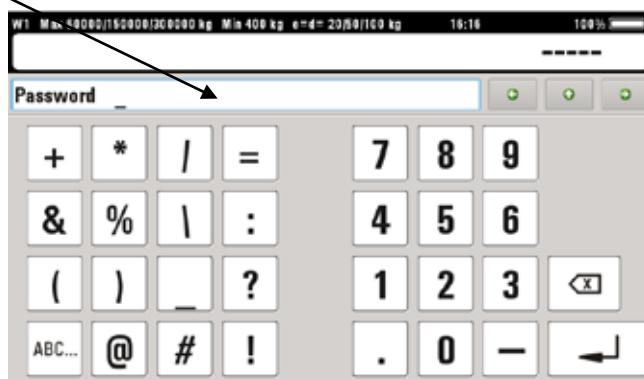
Note: The IT8000E (Ex2/22) has an additional alphanumeric keyboard.

1.5.3 IT6000ET, IT8000ET

With a long touch (min. 2 sec) on the weight display the Service Mode can be called up.

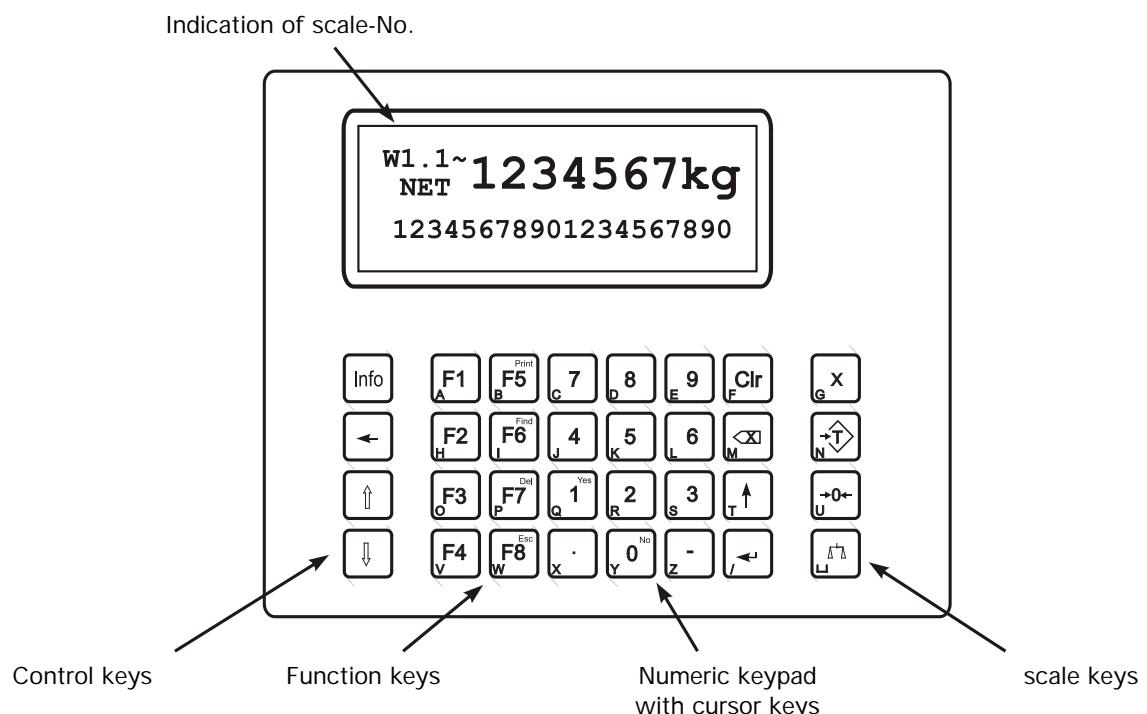


Service Mode entries are made in the info line.



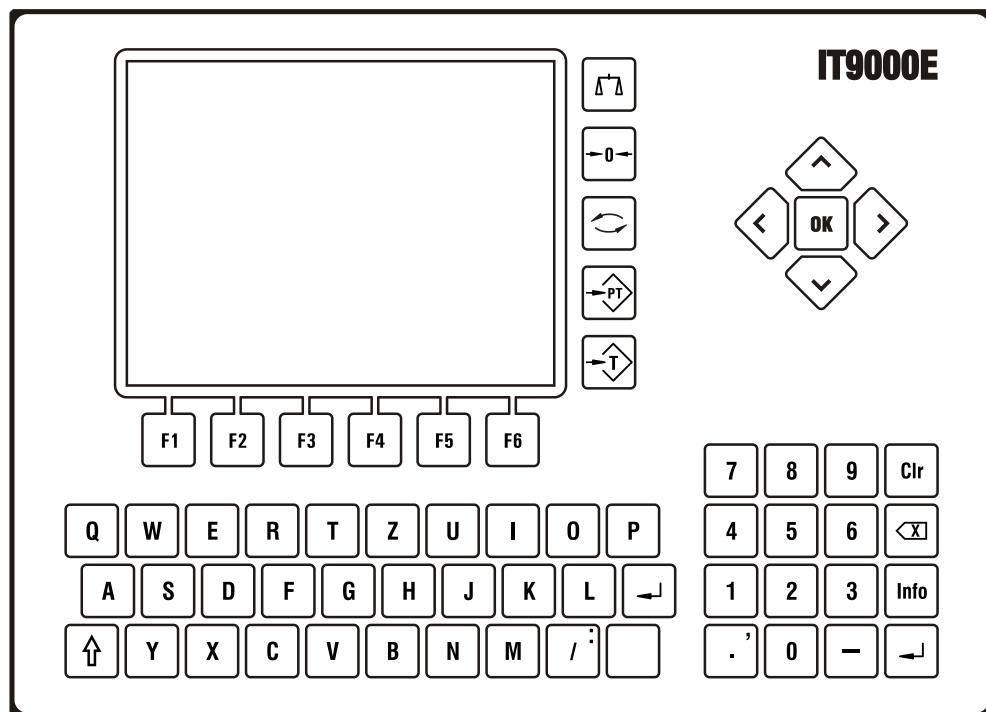
	Set Zero Key to set the scale to zero
	Tare Key for alternately taring of currently displayed weight or clearing the tare weight.
	Display Select Key to switch the display between tare weight / gross weight / gross bargraph / data archive.
	Tare Entry Key to enter preset tare in the tare line, the value is applied after confirmation with the Enter-key.
	Scroll menu
	Confirm entry, proceed to next program step
	Back one level

1.5.4 IT8000, IT8000Ex, IT8000Ex2/22



	Info	Forward scrolling
	¬	Backwards scrolling
Control keys	Ý Info	Access to Service Mode
	Ý	Pressed simultaneously with alpha key: upper case letter
	ß	Pressed simultaneously with alpha key: lower case letter
Function keys	F1 - F8	Functions depending on application program
Clear keys	Clr	Clear entry
	Ó	Delete last character
Cursor key	-	Return to previous program step
Enter key	♂	Confirm entry, continue with next program step
Scale keys	X	Show net weight with tenfold resolution for 5 sec (only in tare step of operating mode Simple Weighing, if enabled in Service Mode)
	→T	Automatic taring, if scale is tared: clear tare
	→0←	Set selected scale to zero
	Δ	Select scale (applicable only if two scales installed)

1.5.5 IT9000E



and	Shift Key for capital letters Pressed simultaneously with Scale-Select-key: Enter Service Mode
	Scale Select Key for switching the weight display to one of a max. of 8 scales.
	Set Zero Key to set the displayed scale to zero (only within zero setting range, selectable in calibration mode)
	Display Select Key to switch the display between tare weight / gross weight / gross bargraph / data archive
	Tare Entry Key to enter a known tare weight in the tare line, confirm with Enter- or OK-key.
	Tare Key alternately taring of currently displayed weight or clearing the tare weight
	Clear input field
	Rub out last character
	Select menu
	Confirm entry, continue with next program step
	Return to previous program step

1.6 Operator Prompting

The following sections describe the operating sequence of the weighing terminal with operator prompts and the requested entries.

The contents of the terminal display is shown in a frame on the left hand side. Next to the display the possible operator entries are listed, on the right hand side comments and explanations are shown.

Example:

Calibr.Weight 999999

Entry of the 6-digit calibration weight

Press Enter-key to continue

Enter Key and -Key

In all program steps, unless otherwise specified, the enter key leads to the next step. Pushing the -Key (Up-key) leads to the previous step.

Numeric Entries (Numerals Only):

A requested numeric entry is depicted by '99999'. The length of the string corresponds to the maximum length of the entry, (e.g.: 99 = 2 digits, numeric).

Numeric entries are made from right to the left. As defined in the program, entry of decimal point and minus sign may be accepted. Fixed point data entries already show the right number of decimals.

Note: In all input steps Clr-key must be pressed to delete old value before a new value can be entered.

Confirm Prompts with Y (1) or N (0):

A prompt or question, e.g. 'Save parameters? Y', is acknowledged by pressing the key '1' and subsequently the -key. By pressing '0' and the -key a negative confirmation is given and -in this case- the parameters are not saved.

Select Functions or Groups, e.g. 'Select Group':

In program steps that require the selection of a function, the options can be displayed by means of the keys and (scrolling). By pressing the enter key the displayed function is selected. Alternatively, the function can also be started directly by entering the corresponding number in the step 'Select Group'. Function selection can be exited by pressing the key.

Parameter Choice, e.g. 'Filter Size OFF':

In program steps that require the selection of a parameter, the options can be displayed by means of the keys and (scrolling). By pushing the enter key the displayed parameter is selected. The selection can be exited via the key.

Prompts or entries that apply only under certain conditions are shown in an extra frame. The condition is shown in bold face in the upper left hand corner of the frame.

Conditional Display or Entry, Example:

If Single-Range Scale is specified:

One Interval

This prompt appears only if Single-Range Scale has been chosen.

1.7 Specific Features Of IT8000, IT8000Ex, IT8000Ex2/22, IT9000E

Select function or group, e.g. 'Select Function 1-8':

In program steps that require the selection of a function or a group, the options can be displayed by means of the -key (scrolling). By pressing the Enter-key , the displayed function is selected.

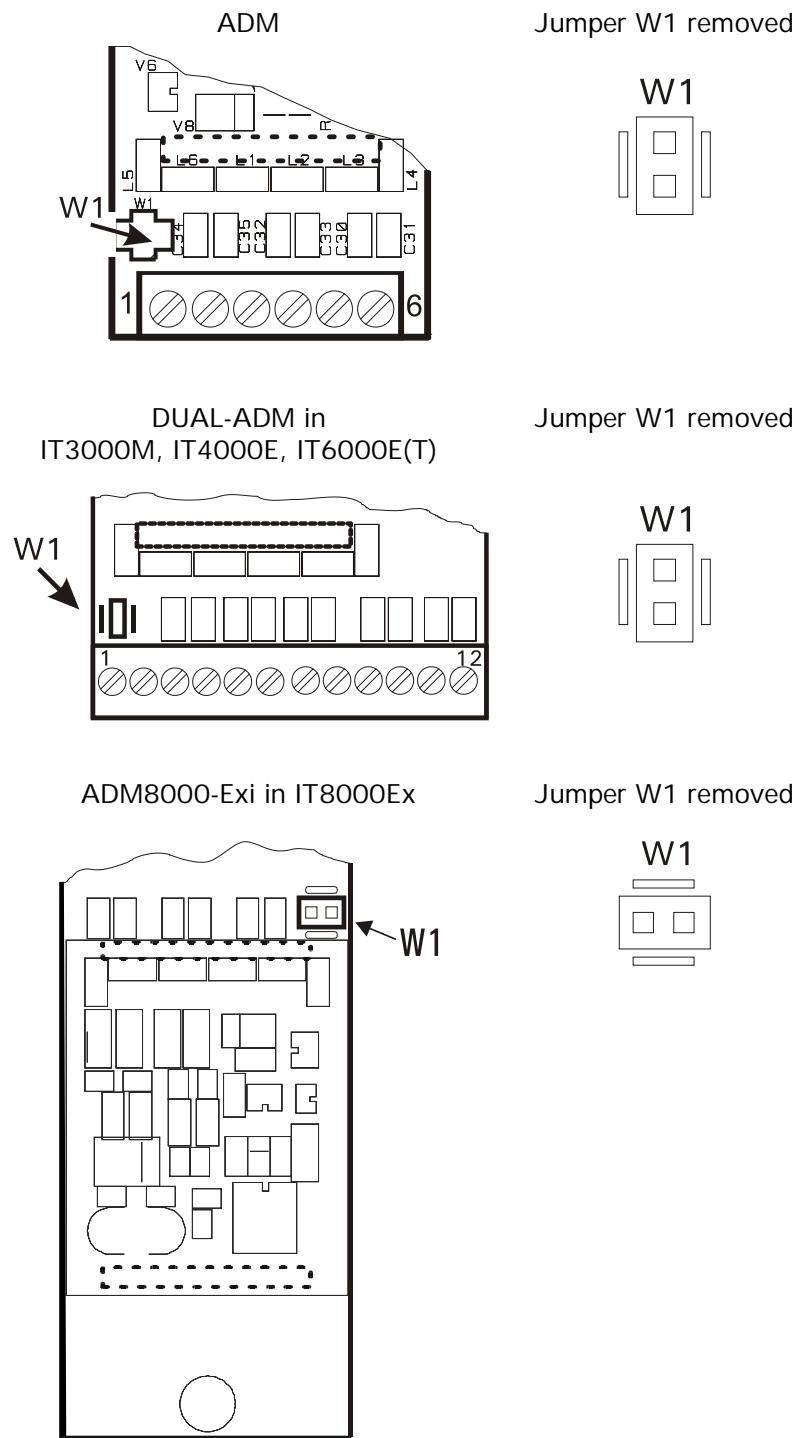
Alternatively, the function can also be started directly by entering the corresponding number in the step 'Select Group'. Function selection can be exited by pressing the -key.

Parameter choice, e.g. '**Filter Size** OFF':

In program steps that require the selection of a parameter, the options can be displayed by means of the -key (scrolling). By pressing the Enter-key , the displayed parameter is selected. The selection can be exited via the -key.

2 Access To Calibration Mode

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



2.1 IT3000M

After power up the terminal, the messages with display of program version and date and time are displayed briefly. By pressing the Info-key while the power up messages are displayed, the Service Mode is called up. After that the program proceeds to the initial step.

IT3000M ..	Display during power up sequence (approx. 12 sec)
IT3000M 9.99 99999	
03.09.01 10:41	Date and time
Info	Call up Service Mode
Service Mode	
Password ?????	Entry of 4-character Service Mode password
Setup: Service	<input type="button"/> Service settings
Service: Interface	Info
Service: Calibration	Calibration mode
	<input type="button"/> Call up displayed group
Calibrate Scale 1	Info Choose scale
Select Group 1-9	Continue in section 'Calibration Mode'

2.2 IT4000E (Ex2/22), IT6000E (Ex2/22), IT8000E (Ex2/22)

The calibration dialog is displayed in the line underneath the scale display. Calibration mode is called up after the start sequence.

Alt and 

ID: 81154926 / v3.01

Show ident-No. of operating system and version of W&M approved software for 2 sec and continue.

Password: ???? 

Entry of the 4-character service password

Service: Interface 

Service: Calibration 

Calibrate Scale 1  

Select scale

Note: With pressing the F1-key the error log of the scale can be viewed.

Select Group 1-9 

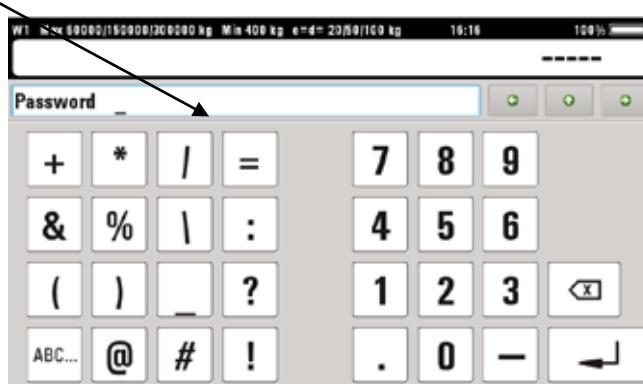
Continue in section 'Calibration Mode'

2.3 IT6000ET, IT8000ET

With a long touch (min. 2 sec) on the weight display the Service Mode can be called up.



Service Mode entries are made in the info line.



ID: 81154926 / V3.01

ID of operating system and the version of the approved software are shown briefly.

Password:

Entry of password (4 digits)

Service: Interface

Service: Calibration



Calibrate Scale 1



Select scale

Note: With pressing the F1-key the error log of the scale can be viewed.



Select Group 1-9

Continue in section 'Calibration Mode'

2.4 IT8000, IT8000Ex, IT8000Ex2/22

After power up, the display shows for approx. 3 sec the power up message:

W1	Scale
----	-------



Enter calibration mode

W1	Scale
Select Group 1-9	

By pressing the -key while the power up message is displayed, the calibration mode can be accessed.

2.5 IT9000E

In the line underneath the scale display, the dialog for the calibration is shown.



and

ID: 81154926 / V3.01

ID of operating system and the version of the approved software are shown briefly.

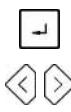
Password: ????

Entry of the 4-character service password

Service: Interface	
--------------------	--

Call up calibration mode

Service: Calibrate	
--------------------	--



Select scale

Calibrate Scale 1	
-------------------	--



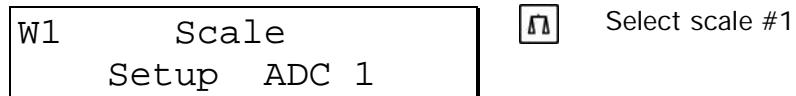
Select Group 1-9	
------------------	--

Continue in section 'Calibration Mode'

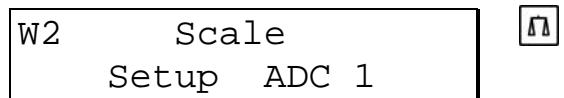
2.6 Select Scale 1 To 8 IT8000, IT8000Ex2/22

At first select scale that is to be calibrated (1 - 8).

Note: Before any scale can be accessed in calibration mode, it must be configured in group 1 of the Service Mode. Scale #1 and #2 are always assigned to the two ADM modules on the main board inside the IT8000 housing, the higher numbers refer to the external extension module (ADCBox).



If more than one A/D module is installed and enabled in Service Mode, the display shows the scale numbers W1 to Wn one after the other. Press Scale-key to enter calibration mode while desired scale-No. is displayed.



3 Calibration Mode

3.1 Select Group

After selecting the scale, the main menu is shown.

Note: IT8000, IT8000Ex, IT8000Ex2/22 show the scale-No. in the upper line of the display, e.g. 'W1 Scale'.

Select Group 1-9	Select calibration group:
	1 Scale Parameters
	2 Calibration
	3 Linearization
	4 Zero Adjust
	5 Adaptation
	6 High Resolution (tenfold resolution)
	7 Reset Parameters
	8 Calculate Span: Calibration without test weights
	9 W&M Info
<input type="button" value="<"/> <input type="button" value=">"/>	Scrolling
<input type="button" value="Info"/>	(Info for IT3000M, IT8000, IT8000Ex2/22, IT9000E only)
<input type="button" value="→"/>	Scrolling backwards (IT8000, IT8000Ex2/22 only)
<input type="button" value="^"/>	Save parameters and return to main menu

The parameter setting and calibration follows the sequence of the group numbers (1, 2, 3, 4) as described in the following chapters. After pressing the -key in step 'Select Group', the display shows the message:

Save Parameters? Y	Save calibration in memory.
	1 Y Save calibration data in EEPROM
	0 N Ignore changes

If calibration jumper W1 was not removed:

Error Calibr. Jumper	Error message: calibration jumper in wrong position, storing the calibration parameters is not possible.
----------------------	--

3.2 Scale Parameters

In this group the weighing ranges, scale intervals and the scale unit are selected. The scale can be configured as Single-Range, Dual-Range or Triple-Range Scale. A Single-Range Scale can be configured as Multi-Interval Scale with two or three different scale intervals.

Select Group 1-9	1 Scale Parameters
Single Range	<input type="button" value="<"/> <input type="button" value=">"/> Select number of scale ranges: <input type="button" value="Info"/> Single Range: Single-Range Scale with one, two or three intervals Dual Range: Scale with two ranges Triple Range: Scale with three ranges

IT8000, IT8000Ex, IT8000Ex2/22: If 'Single Range' has been selected:

W1	Scale
One Interval	

[<] [>]
Info

A Single-Range Scale can be configured as Single-Interval or Multi-Interval Scale:
 One Interval
 Two Intervals
 Three Intervals
 Two Intervals T+
 (scale with two intervals and additive tare)
 Three Intervals T+
 (scale with three intervals and additive tare)

IT4000E, IT6000E(T), IT8000E(T), IT9000E: If 'Single Range' has been selected:

One Interval	
--------------	--

[<] [>]

A Single-Range Scale can be configured as Single-Interval or Multi-Interval Scale:
 One Interval
 Two Intervals
 Three Intervals

If 'Single Range' and 'One Interval' has been selected:

Capacity	999999
----------	--------

Single Range capacity entry
 Example: 'Capacity 1500'

For IT8000, IT8000Ex, IT8000Ex2/22 note: In all input steps Clr-key must be pressed to delete old value before a new one can be entered.

Interval	999.999
----------	---------

Single Range scale interval entry (6 digits).
 Example: 'Interval 0.5'
 Valid scale intervals:
 0.0001, 0.0002, 0.0005, 0.001, 0.002, 0.005, 0.01,
 0.02, 0.05, 0.1, 0.2, 0.5, 1, 2, 5, 10, 20, 50
Note: An invalid entry is rejected with the error message 'Entry Not Valid'.

If 'Dual Range' or 'Two Intervals' or 'Two Intervals T+' has been selected:

High Capacity 999999

Entry of capacity of the highest scale range.
Example: 'High Capacity 6000'

High Interval 999.9999

Entry of interval of the highest scale range.
Example: 'High Interval 2'

Note: An invalid entry is rejected with the error message 'Entry Not Valid'.

Low Capacity 999999

Entry of capacity of the lowest range:
Example: 'Low Capacity 3000'

Note: If the value for 'Low Capacity' is greater than that for 'High Capacity', the error message 'Entry Not Valid!' is shown.

Low Interval 999.9999

Entry of interval of the lowest scale range.
Example: 'Low Interval 1'

Note: An invalid entry is rejected with the error message 'Entry Not Valid'.

The values for 'Low Interval' and 'High Interval' must not be identical, or the message 'Entry Not Valid' is shown.

If 'Triple Range' or 'Three Intervals' or 'Three Intervals T+' has been selected:

High Capacity 999999

Entry of capacity of the highest scale range
Example: 'High Capacity 6000'

High Interval 999.9999

Entry of interval of the highest scale range
Example: 'High Interval 2.0'

Note: An invalid entry is rejected with the error message 'Entry Not Valid'.

Mid Capacity 999999

Entry of capacity of the medium scale range
Example: 'Mid Capacity 3000'

Note: If the value for 'Mid Capacity' is greater than that for 'High Capacity', the error message 'Entry Not Valid!' is shown.

Mid Interval 999.9999

Entry of interval of the medium scale range
Example: 'Mid Interval 1.0'

Note: An invalid entry is rejected with the error message 'Entry Not Valid'.

Low Capacity 999999

Entry of capacity of the lowest scale range
Example: 'Low Capacity 1500'

Note: If the value for 'Low Capacity' is greater than that for 'Mid Capacity', the error message 'Entry Not Valid!' is shown.

Low Interval 999.9999

Entry of interval of the lowest scale range
Example: 'Low Interval 0.5'

Note: An invalid entry is rejected with the error message 'Entry Not Valid'.

Unit	kg	<input type="button" value="<"/>	<input type="button" value=">"/>	Select one of the following units: kg, g, t, lb
------	----	-------------------------------------	-------------------------------------	--

 Return to 'Select Group'

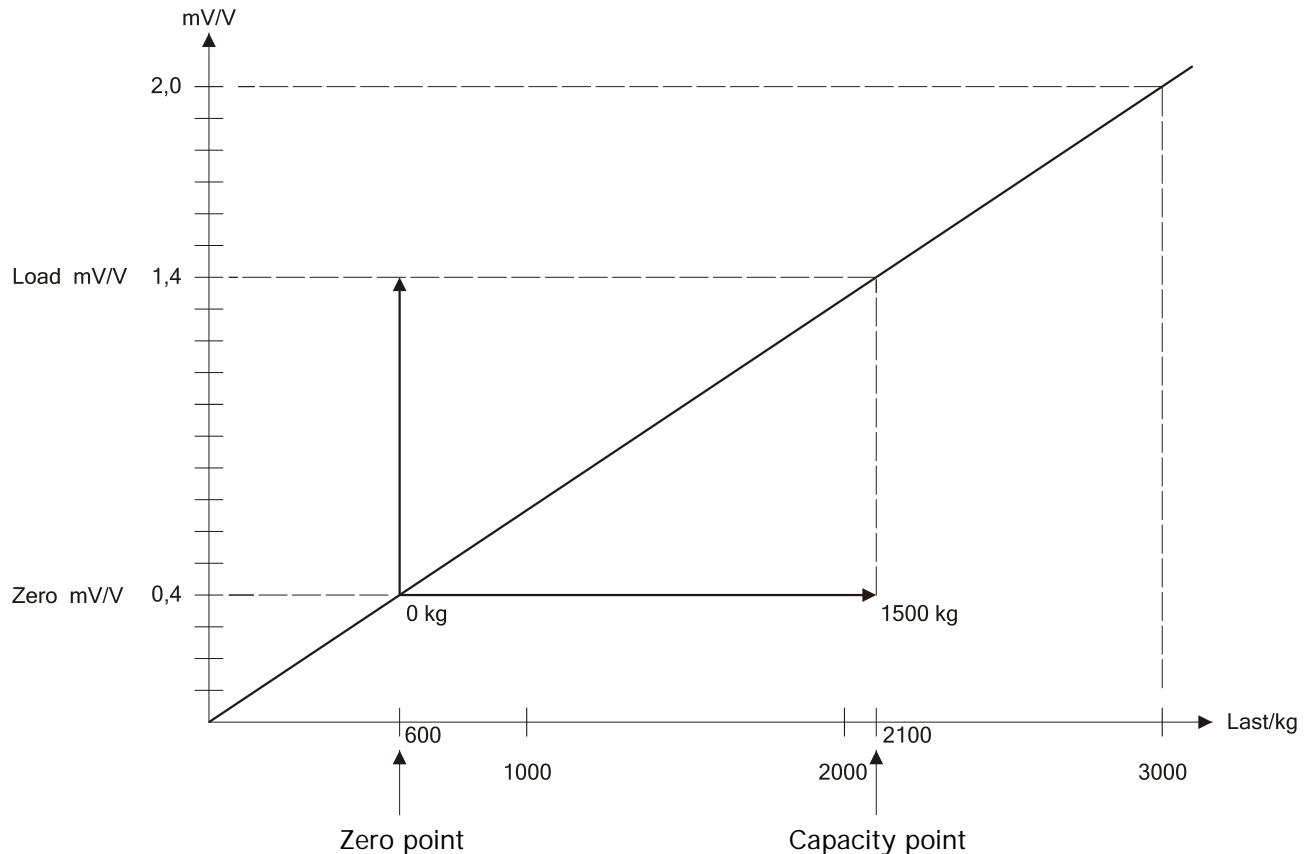
3.3 Calibration

The zero calibration and maximum load calibration are performed in this group. Instead of calibrating to maximum load, a calibration with partial load is also possible.

The Geo Value entry permits the calibration at one place even if the scale is to be operated at a different location. This compensates for the different forces of gravity without recalibration (not for W&M approved applications). By means of entering the rated signals (mV/V), a scale can also be precalibrated without test weights (see also chapter 'Precalibration').

Example for a calibration of a hopper scale:

- 3 loadcells with a capacity of 1000kg each with a sensitivity of 1,99995mV/V, 2,00005mV/V and 2,00000mV/V are used.
- The scale capacity is 1500kg with a division of 0.5kg.
- The weight of the empty hopper is 600kg.



Select Group 1-9	2 Calibration
If linearization points already exist:	
Fixpoints active!	One or more linearization points are already configured, these may affect calibration.
Geo Value 99	Entry of Geo Value. Enter the applicable Geo Value of the calibration location (see also chapter Geo Values).
Calibrate Zero? Y	<p>Scale Zero Calibration. Unload the scale and confirm to start the calibration.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> < > Info </div> <p>Yes: Calibrate Zero No: Continue in step 'Zero(mV/V)'</p>
Calibrating...	Measuring Zero signal.
Zero: 0.00	Displays actual weight with tenfold resolution (for verification).
Zero(mV/V): 0.40000	<p>Display of rated signal See 'Calculate Span'. Note: The signal in millivolt can be obtained by multiplying the displayed mV/V value with the 'Excitation' (5V or 10V).</p>
Notes:	
<ul style="list-style-type: none"> If applicable, press Clr-key to delete value and enter a new one. If Zero calibration parameters are to be stored before the Span calibration, the Setup must be exited at this point of the sequence. Answer question 'Save Parameters?' with 'Yes'. After that Group 2 can be selected again to proceed with calibration, Zero calibration can now be skipped. 	
Calibrate Load? Y	<p>Load calibration weight on scale. Note: For best results use the highest possible calibration load.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> < > Info </div> <p>Yes: Calibrate Load No: Continue in step 'Load(mV/V)'</p>
Calibr.Weight 999999	Entry of calibration weight
Clr	Clear displayed default value and enter calibration weight.
→	Apply load and start calibration
Calibrating...	Measuring load signal.
Load: 9999999	Displays actual weight with tenfold resolution (for verification).

Load (mV/V) : 1.40000

Display of rated signal
See 'Calculate Span'.

Note: The signal in millivolt can be obtained by multiplying the displayed mV/V value with the 'Excitation' (5V or 10V).

Note: If applicable, press **Clr -key** to delete value and enter a new one.

If the internal resolution is insufficient, the following error message is displayed:

Resolution Error

The internal resolution should be at least 10 times higher than the entered resolution.

Check calibration values and repeat calibration if required.

To store calibration parameters exit step 'Select Group' and answer question 'Save Parameters' with 'Yes'.

Note: If changes of calibration parameters are to be ignored, setup must be exited and question 'Save Parameters?' answered with 'No' before any other group of the calibration may be called up.

3.4 Linearization

Certain weighing inaccuracies are the result of the inherent non-linearity of the load sensor. Up to 6 linearization points can be set freely to compensate this imperfection. Linearization points should be entered at the points of the weighing curve where the greatest deviations (i.e. max. non-linearity) are experienced.

Linearization points must be smaller than the max. weighing range. The linearization algorithm interprets the sections between two neighboring linearization points as a straight line.

Select Group 1-9

3 Linearization

Linearization points already entered:

Fixpoint 1: 999999

Display of linearization points (1 - max. 6)

Calibrate Fixpt? N



Lin.Signal 0.50000



Display linearization signal



Delete existing linearization point

Clr-key pressed in previous step:

Delete Fixpoint? N



Yes: Delete linearization point



No: Do not delete linearization point



On Yes: Proceed to step 'New Fixpoint?'

On No: Continue with next linearization point

After deleting an existing fixpoint, the remaining ones are renumbered in rising order.

After display of the last linearization point or if there is no linearization point calibrated yet:

New Fixpoint 1? N	<input type="button" value="<"/> <input type="button" value=">"/>	Yes: Enter fixpoint No: Do not enter fixpoint
	<input type="button" value="Info"/>	On Yes: Continue On No: Return to 'Select Group'
Enter Fixp.1 9999999	Enter linearization weight	
Calibrate Fixpt.? N	<input type="button" value="<"/> <input type="button" value=">"/>	Yes: Calibrate fixpoint No: Entry of linearization signal
If 'Calibrate Fixpt' = Yes Linearization.. Measuring the linearization signal.		
Weight: 9999999	Display actual weight with tenfold resolution (for verification).	
Lin.Signall 0.50000	Show linearization signal, this value can be accepted or cleared and overwritten, if required.	
	<input type="button" value="<"/>	Continue in step 'New Fixpoint?'

A new fixpoint can be inserted between existing ones, after that all fixpoints are renumbered in rising order.

3.5 Zero Adjust

In this group the scale's Zero point is readjusted. This feature is useful if the calibration load was applied on an auxiliary test rig (e.g. for overhead track scales). After removing the test rig, the absolute Zero point can be adjusted.

Select Group 1-9	4 Zero Adjust
If linearization points exist: Fixpoints active! One or more linearization points are already configured, these may affect calibration.	
Unload Scale	Unload test rig or other loads
	<input type="button" value="<"/> Start Zero Adjust
Adjusting...	Measuring the Zero signal.
Zero: 0.00	Displays of the new zero point with tenfold resolution (for verification).
Zero(mV/V): 0.50000	Display of rated signal See "Calculate Span"
	<input type="button" value="<"/> Continue in step 'Select Group'

3.6 Adaptation

In this group parameters are entered to adapt the scale to its environment.

Select Group 1-9

5 Adaptation

Motion Window 0.5D



Info

Entry of Motion Window Size.

A stable weight is detected by the A/D converter (no motion) when the number of consecutive weight readings (interval specified in the next step) is within this window.

OFF: motion detector off

3.0D, 2.0D, 1.0D, 0.5D: Window size

Motion Counter 99

Interval for no-motion detection.

Specify the interval in units of 0,02 sec (20 msec) during which consecutive weight readings must fall into the range specified with motion window size.

Example: 20 = 0.4 sec interval.

Filter Size OFF



Info

Entry of Filter Strength (for digital weight filter).

Filter off: IT8000, IT8000Ex, IT8000Ex2/22:OFF, IT4000E, IT6000E(T), IT8000E(T), IT9000E = 0 1 to 20: light to strong filtering

Default setting: 11

If the scale is very unstable (e.g. livestock scale) a strong filtering is recommended.

Note: Filter Size can also be set in Service Mode (Group 1, after selecting scale driver ADM). Thus filtering can be adjusted after the scale has been stamped without breaking the seal.

The setting of the Filter Size in Service Mode overwrites the value entered during calibration with every start of the application program. To verify the valid setting, check value in Service Mode!

Auto Zero Range 0.5D



Info

Select range for Automatic Zero Adjust. (E.g. enter 0.5D for a range from - 0.5D to + 0.5D.)

Zero tracking is enabled within the selected range.

OFF: Disable Zero Adjust

0.5D, 1.0D, 3.0D: zero tracking range

PbZero (%) + 999

Select + range for Pushbutton Zero and Auto Zero Range above power up zero.

The scale can be set to Zero by pressing the Zero-key within the specified range.

Factory setting: 2%

PbZero (%) - 999

Select -range for Pushbutton Zero and Auto Zero Range below power up zero.

The scale can be set to Zero by pressing the Zero-key within the specified range.

Factory setting: 2%

PowerUp Zero +/- 10%	<input type="button" value="<"/> <input type="button" value=">"/>	Info	Select range for automatic Zero setting after power up. (E.g. enter 2% for a range from -2% to + 2% of the scale capacity).
----------------------	---	------	---

After power up the scale will be automatically set to Zero if the weight is within the selected range.

OFF: Disable Power Up Zero

±2%, ±10%: range

Overload	999999	Select the threshold for display blanking. (E.g. enter 9 to set the limit to capacity + 9D).
----------	--------	--

The scale display shows '-----' when the scale weight exceeds the selected limit.

Example: 'Overload 9'

(For multiple-range scales, 1d corresponds to the smallest weighing range.)

Incline Switch	OFF	<input type="button" value="<"/> <input type="button" value=">"/>	Info	Connection of incline sensor for mobile weighing on Inp.0 - Inp.7.
----------------	-----	---	------	--

OFF no incline sensor

Inp.0 incline sensor connected on Inp.0 - 7

...

Inp.7

If an incline sensor is connected and the permissible inclination exceeded, the display of the indicator is blanked. Instead of the weight only a slash '/' is shown.

NTEP approval?	N	1/Y 0/N	Set measuring parameters compliant to US regulations (National Type Evaluation Program) in accordance with Handbook 44.
----------------	---	------------	---

N Disabled (default)

Y Enabled

Note: Must be set to Y(es) for all applications in US, Canada and Australia!

Underload 20d?	Y	1/Y 0/N	Display blanking for gross weights smaller than -20d (under zero):
----------------	---	------------	--

N Disabled

Y Enabled (default)

For applications compliant to OIML R76 underload blanking must be enabled.

With Taring ?	Y	1/Y 0/N	Enable / disable tare functions: N: Tare functions disabled Y: Tare functions enabled (default)
---------------	---	------------	---

For scales working only in gross mode, the tare functions can be disabled to avoid the tests of the tared scale during W&M verification.

Only IT4000E, IT6000E (T), IT8000E (T), IT9000E

Onscreen typeplate? Y	1/Y 0/N	Enable / disable the display of the 'Electronic marking plate' above the weight display: Y: Marking plate is shown N: Field is blanked.
-----------------------	------------	---

Update Rate	225
-------------	-----

Choose update rate of digital filter:

Range: 50 ... 800 Hz

Default setting: 225 Hz.

If vibrations are experienced at the place of installation, the setting of the digital filter can be optimized. The update rate should be chosen to differ as much as possible from the frequency of the vibration and its harmonics.



Return to 'Select Group'

3.7 High Resolution

In this group the weight is shown with tenfold resolution. Use this group to check the scale accuracy.

Select Group 1-9

6 High Resolution

Weight: 9999999

Displays the actual weight with tenfold resolution (for information only).

9999999 kg

Info Displays the actual weight and unit

Counts: 9999999

Info Display of Raw Counts

Signal mV/V: 9999999

Info Display of rated signal

Weight: 9999999



Return to 'Select Group'

3.8 Reset Parameters

In this group the scale parameters can be reset to default values. After resetting the parameters the scale must be reconfigured.

Select Group 1-9	7	Reset Parameters
Reset Parameters? N	<input type="button" value="<"/> <input type="button" value=">"/>	No: Do not reset parameters Yes: Reset parameters (see table)
Info		

Factory Settings:

Group	Parameter	Factory Setting	Your Calibration
1 (Scale Parameters)	Single/Dual/Triple Range	Single Range	
	Capacity	3000	
	Interval	1	
	Unit	kg	
2 (Calibration)	Geo Value	20	
	Zero (mV/V) W1	0.00000	
	Load (mV/V) W1	2.00000	
	Zero (mV/V) W2	0.00000	
	Load (mV/V) W2	2.00000	
5 (Adaptation)	Motion Window	0.5D	
	Motion Count(er)	20	
	Filter Size	11	
	Auto Zero Range	0.5D	
	Pushbutton Zero (+)	2%	
	Pushbutton Zero (-)	2%	
	Power Up Zero	OFF	
	Overload	9D	
	Incline Switch	OFF	
	NTEP (IT8000, IT8000Ex)	N	
	Underload 20d	Y	
	With Taring	Y	
8 (Calculate Span)	Update Rate	225	
	Zero (mV/V)	0.00000	
	LC-Capacity	0	
	No.Of LCs	1	
	mV/V Of LC1	2.00000	

3.9 Calculate Span

When the rated output signal of a scale's loadcell(s) is known, calibration can be made without test weights. This information is available, for instance, for loadcell types D1, C2 and C3 OIML, for which test reports are issued by the manufacturer stating the rated output in mV/V.

A prerequisite is that the unloaded scale can be calibrated at zero, which is usually the case.

Example for a theoretical calibration of a hopper scale:

- 3 loadcells with a capacity of 1000kg each with a sensitivity of 1,99995mV/V, 2,00005mV/V and 2,00000mV/V are used.
- The scale capacity is 1500kg with a division of 0.5kg.
- The weight of the empty hopper is 600kg.

Select Group 1-9	8 Calculate Span
Calibrate Zero? Y	Scale Zero Calibration. Unload the scale and confirm to start the calibration.
	<input type="button" value="<"/> <input type="button" value=">"/> Yes: Calibrate Zero <input type="button" value="Info"/> No: Continue in step 'Zero(mV/V)'
Calibrating...	Measuring Zero signal.
Zero: 0.00	Displays actual weight with tenfold resolution (for verification).
Zero(mV/V): 0.40000	Display of rated signal (20% dead load = 20% signal)
LC-Capacity 1000	Enter nominal capacity of one loadcell, in unit as chosen in Group 1 (Scale Parameters\Unit)
No. Of LCs 3	Enter number of connected loadcells: IT4000E, IT6000E(T), IT8000E(T), IT8000, IT9000E: max. 16; IT8000Ex: max. 4
mV/V of LC1 1.99995	Enter rated signal of first loadcell. Continue with next loadcell, after the last loadcell continue in the next step.
Load(mV/V): 1.40000	Display of the calculated rated signal at full load. (20% dead load + 50% net load)
	<input type="button" value="↶"/> Return to 'Select Group'

Note: Value can be deleted with Clr-key to enter new one.

3.10 W&M Info

In this group the setting of parameters can be checked that are relevant for W&M approved scales. Any deviation is indicated.

Select Group 1-9	9	W&M Info
------------------	---	----------

Check parameters for W&M approved scales (permissible values in brackets):

Motion Window	(0.5d)
Motion Counter	(³ 7)
Autozero Range	(0.5d)
Pushbutton Range	(£4%)
Overload	(max. 9d)

If all settings comply with W&M regulations a corresponding message is displayed:

W&M Setup ok

If settings do not comply with W&M regulations a corresponding message is displayed, example:

Error: Overload > 9d	Value for overload blanking is set to a value greater than 9d.
----------------------	--

<input type="button" value=""/>	Continue
---------------------------------	----------

3.11 Factory Calibration

The A/D converter of the weighing terminal stores the calibration parameters in a powerfail safe EEPROM.

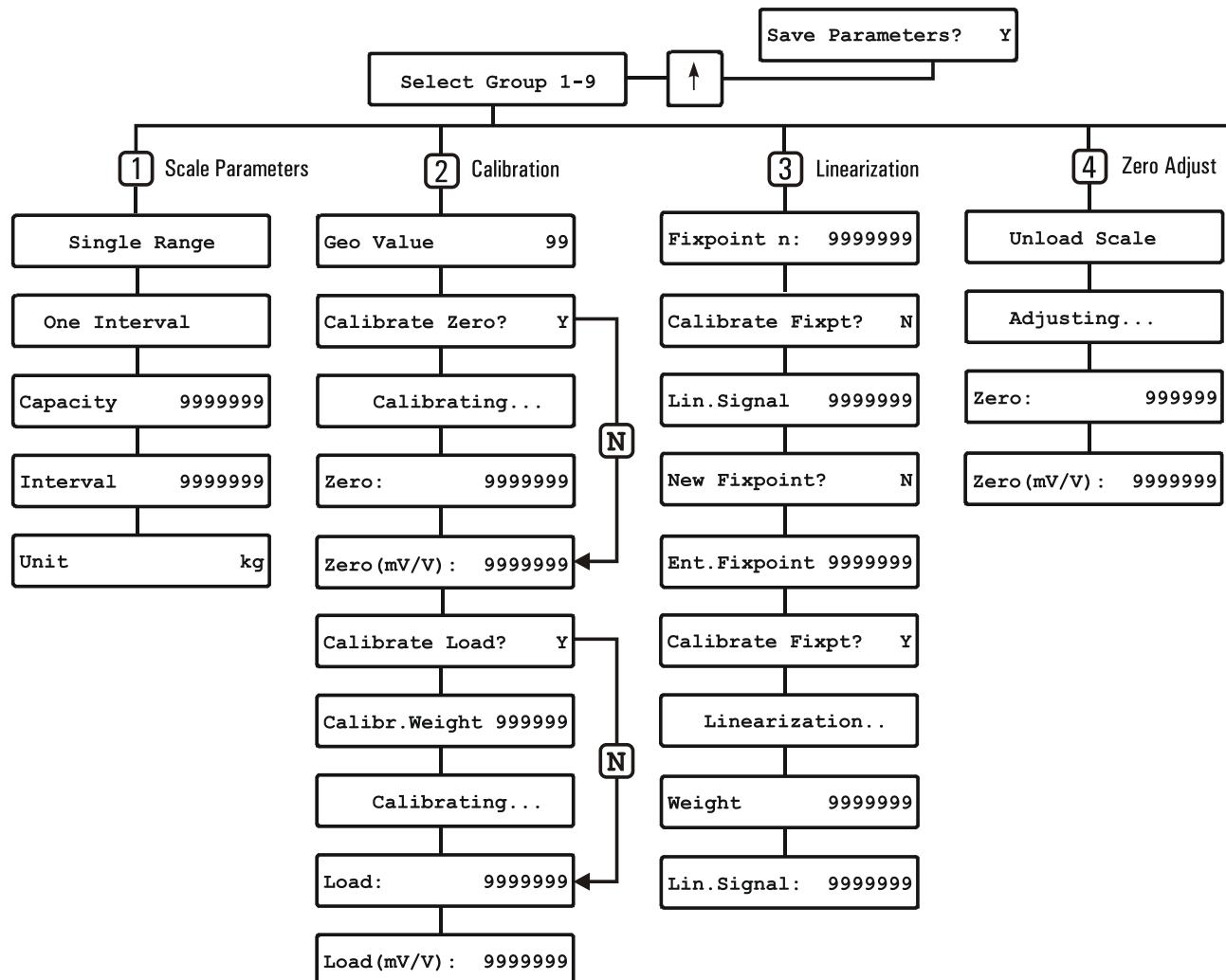
During testing and checkout of a weighing terminal, the A/D converter is factory calibrated. I.e. correction factors (Gain and Offset) are measured by means of precision simulators and stored to equalize the different amplification values of the individual A/D boards.

When a scale is calibrated, the rated values (mV/V) are measured for Zero (preload) and Load (preload plus weighing range). Due to the factory pre-calibration (and resulting near-identical amplification), these rated values can be transferred from one A/D board to another one, if there is a need to do so, e.g. in the event of a break down to minimize down time. However, it is strongly recommended to check the accuracy of the scale with test weights as soon as possible. Recalibration with certified test weights is mandatory for scales that are subject to Weights & Measures approval.

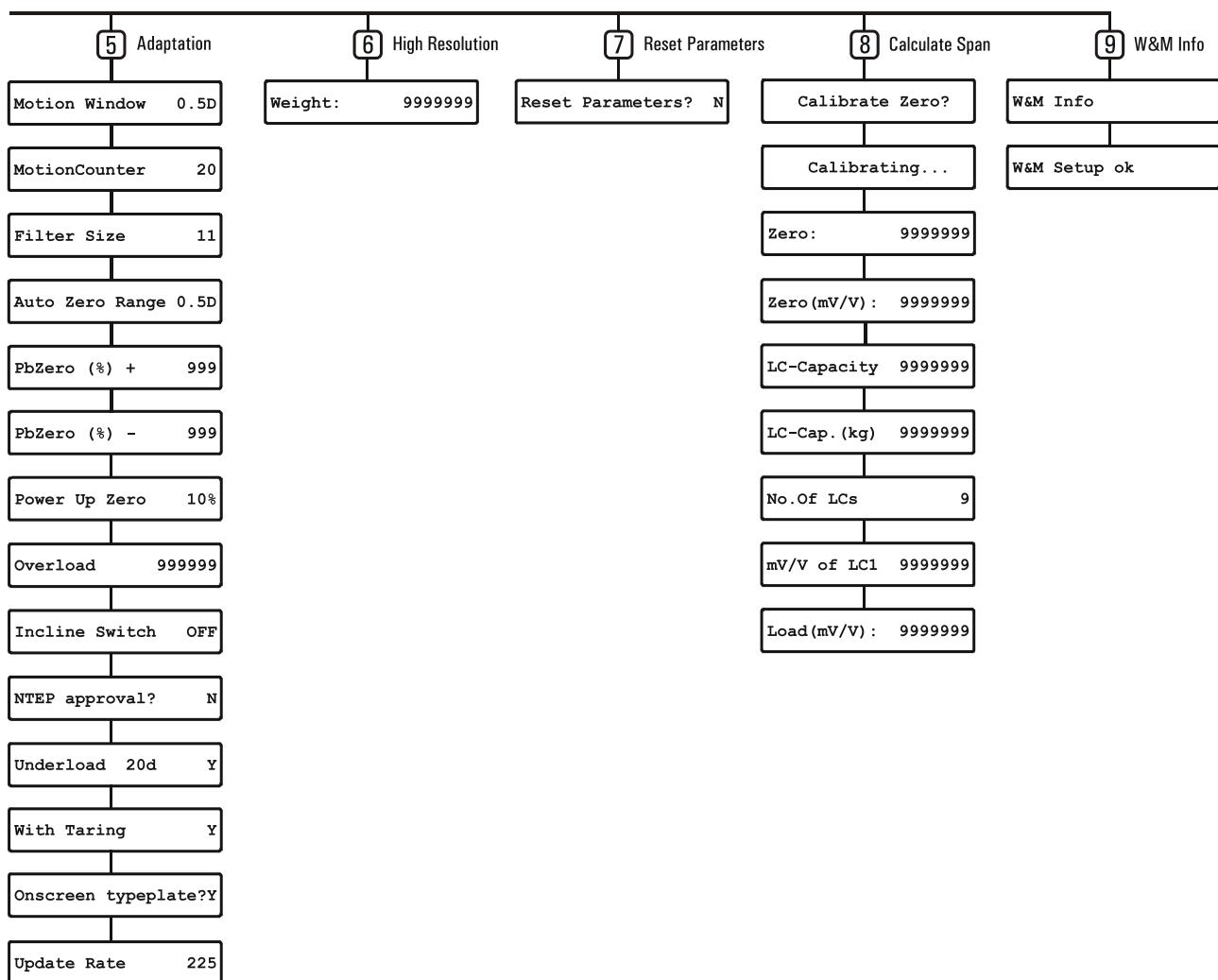
Entry of rated values is made in Calibration Mode, Group 2, in the steps 'Zero(mV/V)' and 'Load(mV/V)'.

3.12 Overview Calibration Mode

Part 1:



Part 2:



4 Mastermode

The Mastermode allows to inspect the zero offset and to modify the Adapt-Mode parameters.

4.1 Info Zero-Offset

Mastermode : Info

Zero-Offset : 999

Display of the zero offset relative to the calibrated zero value, it is shown in the calibrated unit in X10 representation.

4.2 Adapt Mode

The Adapt Mode provides options to optimize the digital filtering of the captured weight:

4.2.1 IT3000M Access From Weighing Mode

W1 15,00kg NET Example for weight display in initial step

F8 Call up entries (Supervisor Mode)

Sel: Parameter

Sel: Mastermode

Mastermode : Info

Mastermode : Adapt Continue in section 'Adapt Mode Parameter'

4.2.2 IT4000E/IT6000E/IT8000E Access From Weighing Mode

and

Mastermode : Info

Mastermode : Adapt Continue in section 'Adapt Mode Parameter'

4.2.3 IT9000E Access From Weighing Mode

and

Mastermode : Info

Mastermode : Adapt Continue in section 'Adapt Mode Parameter'

4.2.4 IT6000ET, IT8000ET Access From Weighing Mode

Press 'Display switching key' until 'Firmware Information' appears.



Press key 'Mastermode'.



Mastermode entries are made in the Info-line.



Mastermode: **Info**

Mastermode: **Adapt** Continue in section 'Adapt Mode Parameter'

4.2.5 IT3000M, IT4000E, IT6000E(T), IT8000E(T), IT9000E Access From Service Mode

Service: Calibration

Calibrate Scale 1

F2

Mastermode: Info > IT3000M: Info

Mastermode: Adapt - Continue in section 'Adapt Mode Parameter'

4.2.6 IT8000, IT8000Ex, IT8000Ex2/22 Access From Service Mode

Service Mode
Select Group 1-7

1 Interface configuration

Interfaces
Scale 1 ADC

F1 Continue in section 'Adapt Mode Parameter'

4.2.7 Adapt Mode Parameter

Damping	0	<input type="button" value="<"/> <input type="button" value=">"/>	Damping
		Info	With this parameter the 'Filter Size' as set in the calibration can be changed by up to + 5 or -5 steps. Default setting is 0.
-5 to + 5: Adaptation of filter size			

Not for IT8000, IT8000Ex, IT8000 Ex2/22:

Type	Standard	<input type="button" value="<"/> <input type="button" value=">"/>	Filter characteristic
		Info	Choose characteristic of digital filter:
Standard			
Critically Damped			
Butterworth			
Bessel			

Only for 'Critically Damped, Butterworth, Bessel'

Passes	2	Order of filter
		Choose order of filter, valid range:
		1 - 20

Vib. Filter	DOSING	<input type="button" value="<"/> <input type="button" value=">"/>	Filter type
		Info	Choose the filter type for the application. 'DOSING' is optimized for filling applications when changes of the load must be processed without delay. 'WEIGHING' is better suited for static weighing when fast changes of the weight must be captured, but small deviations - such as vibrations- must be filtered.
DOSING Optimized for filling			
WEIGHING Optimized for static weighing			

Vib. Size	1	<input type="button" value="<"/> <input type="button" value=">"/>	Working window of vibration filter
		Info	If extreme vibrations are experienced, this parameter serves to adapt the working window of the vibration filter. Default setting is 1. Caution! Do not increase this setting unless a stable display could not be reached with the Adapt Mode parameter 'Damping' and the Calibration Mode parameters 'Filter Size' and 'Update Rate'.
1 to 8: Increase working window			

4.3 Calibration Mode SUMMING

Only for IT8000, IT8000E(T), IT8000E Ex2/22, IT8000Ex2/22, IT9000E.

4.3.1 Select Group

Passwort **????** Enter service password



Select Group 1-3 **< >** Select parameter group:
Info

- 1 Summing Parameters
- 2 Adaptation
- 3 Reset Parameters

In groups 1 – 3 the summing scale parameters are entered as described below. After setting the parameters and pressing the - key in step 'Select Group' the display shows:

Save Parameters? **Y** **< >** Yes: Save parameters
Info No: Ignore changes and exit

4.3.2 Summing Parameters

In this group the summing function can be activated and the summing parameters entered.

Select Group 1-3 **1** Summing Parameters

Summing Scale **OFF** **< >** OFF: Summing Scale disabled
Info ON: Summing Scale enabled

Sum Capacity **999999** Enter the Summing Scale capacity.
Example: 'Sum Capacity 60000'

Sum Interval **999.999** Enter the Summing Scale interval.
Example: 'Sum Interval 20'

Valid scale intervals:
0.0001, 0.0002, 0.0005, 0.001, 0.002, 0.005, 0.01,
0.02, 0.05, 0.1, 0.2, 0.5, 1, 2, 5, 10, 20, 50, 100,
200

Note: An invalid entry is rejected with the error message 'Entry Not Valid'.

4.3.3 Summing Adaptation

In this group overload for the summing scale is set.

Select Group 1-3

2 Summing Adaptation

Sum Overload 999999

Select the threshold for display blanking. (E.g. enter 9 to set the threshold to sum capacity + 9D).

The scale display shows '-----' when the summing scale weight exceeds the selected threshold.

Example: 'Overload 9'

Sum Grossmode N

When 'gross mode' is chosen, the summing scale only works in this mode, taring is disabled.

Note: Only required in Australia, not for EC countries.

4.3.4 Reset Summing Parameters

In this group the scale parameters of the summing scale can be set to default values.

Select Group 1-3

3 Reset Parameters

Reset Parameters? N

< >
Info

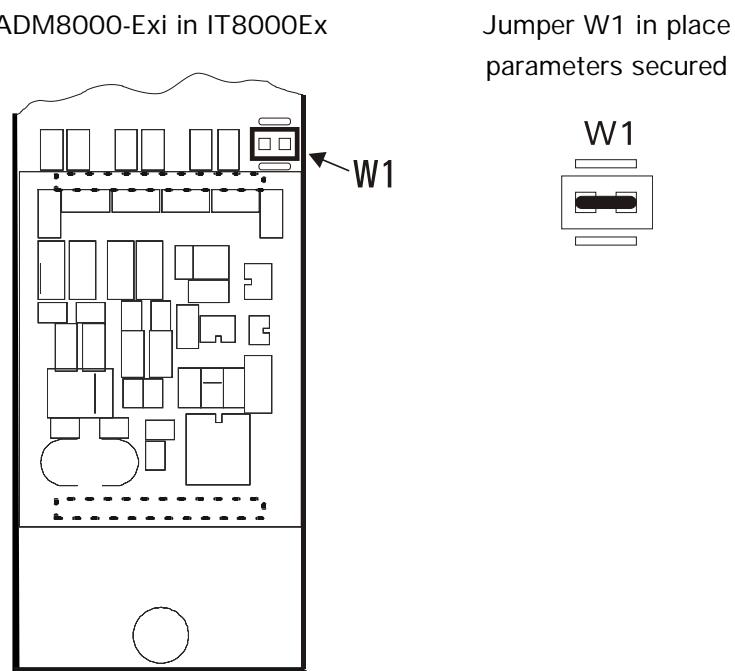
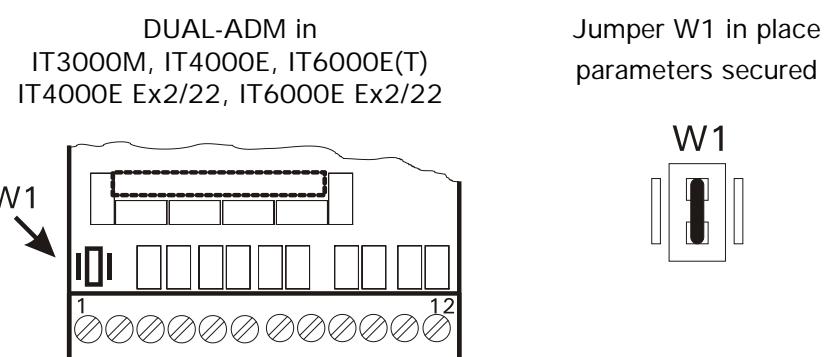
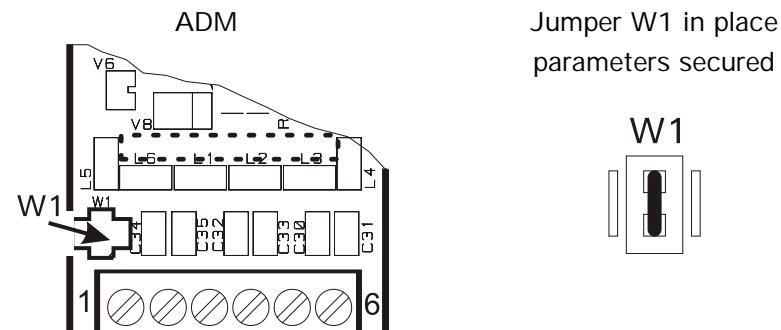
No: Do not reset parameters
Yes: Reset parameters (see table)

Factory Settings:

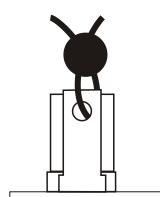
Group	Parameter	Factory Setting	Your Calibration
1 (Scale Parameters)	Summing Scale	OFF	
	Summing Capacity	-	
	Summing Interval	1	
2 (Adaptation)	Overload	9	
	Sum Grossmode	N	

5 Securing Scale Parameters

The scale parameters are stored in EEPROM memory and secured by setting the jumper W1.



W&M approved applications require that the calibration parameters be protected against unauthorized modifications. To that effect the jumper can be sealed with thread and lead seal.



6 Geo Values

Examples for Geo Values by country:

Country	Geo Value
France	20
Finland	24
Belgium	21
Denmark	23
Germany	20
Great Britain	21
Ireland	22
Norway	24
Netherland	21
Austria	19
Switzerland	18
Sweden	24
Spain	15

Table of Geo Values

Northern or southern terrestrial latitude in degrees and minutes				Height above sea level (in meters)											
				0 325	325 650	650 975	975 1300	1300 1625	1625 1950	1950 2275	2275 2600	2600 2925	2925 3250	3250 3575	
				Height above sea level (in feet)											
0°	0'	-	5°	46'	5	4	4	3	3	2	2	1	1	0	0
5°	46'	-	9°	52'	5	5	4	4	3	3	2	2	1	1	0
9°	52'	-	12°	44'	6	5	5	4	4	3	3	2	2	1	1
12°	44'	-	15°	6'	6	6	5	5	4	4	3	3	2	2	1
15°	6'	-	17°	10'	7	6	6	5	5	4	4	3	3	2	2
17°	10'	-	19°	2'	7	7	6	6	5	5	4	4	3	3	2
19°	2'	-	20°	45'	8	7	7	6	6	5	5	4	4	3	3
20°	45'	-	22°	22'	8	8	7	7	6	6	5	5	4	4	3
22°	22'	-	23°	54'	9	8	8	7	7	6	6	5	5	4	4
23°	54'	-	25°	21'	9	9	8	8	7	7	6	6	5	5	4
25°	21'	-	26°	45'	10	9	9	8	8	7	7	6	6	5	5
26°	45'	-	28°	6'	10	10	9	9	8	8	7	7	6	6	5
28°	6'	-	29°	25'	11	10	10	9	9	8	8	7	7	6	6
29°	25'	-	30°	41'	11	11	10	10	9	9	8	8	7	7	6
30°	41'	-	31°	56'	12	11	11	10	10	9	9	8	8	7	7
31°	56'	-	33°	9'	12	12	11	11	10	10	9	9	8	8	7
33°	9'	-	34°	21'	13	12	12	11	11	10	10	9	9	8	8
34°	21'	-	35°	31'	13	13	12	12	11	11	10	10	9	9	8
35°	31'	-	36°	41'	14	13	13	12	12	11	11	10	10	9	9
36°	41'	-	37°	50'	14	14	13	13	12	12	11	11	10	10	9
37°	50'	-	38°	58'	15	14	14	13	13	12	12	11	11	10	10
38°	58'	-	40°	5'	15	15	14	14	13	13	12	12	11	11	10
40°	5'	-	41°	12'	16	15	15	14	14	13	13	12	12	11	11
41°	12'	-	42°	19'	16	16	15	15	14	14	13	13	12	12	11
42°	19'	-	43°	26'	17	16	16	15	15	14	14	13	13	12	12
43°	26'	-	44°	32'	17	17	16	16	15	15	14	14	13	13	12
44°	32'	-	45°	38'	18	17	17	16	16	15	15	14	14	13	13
45°	38'	-	46°	45'	18	18	17	17	16	16	15	15	14	14	13
46°	45'	-	47°	51'	19	18	18	17	17	16	16	15	15	14	14
47°	51'	-	48°	58'	19	19	18	18	17	17	16	16	15	15	14
48°	58'	-	50°	6'	20	19	19	18	18	17	17	16	16	15	15
50°	6'	-	51°	13'	20	20	19	19	18	18	17	17	16	16	15
51°	13'	-	52°	22'	21	20	20	19	19	18	18	17	17	16	16
52°	22'	-	53°	31'	21	21	20	20	19	19	18	18	17	17	16
53°	31'	-	54°	41'	22	21	21	20	20	19	19	18	18	17	17
54°	41'	-	55°	52'	22	22	21	21	20	20	19	19	18	18	17
55°	52'	-	57°	4'	23	22	22	21	21	20	20	19	19	18	18
57°	4'	-	58°	17'	23	23	22	22	21	21	20	20	19	19	18
58°	17'	-	59°	32'	24	23	23	22	22	21	21	20	20	19	19
59°	32'	-	60°	49'	24	24	23	23	22	22	21	21	20	20	19
60°	49'	-	62°	9'	25	24	24	23	23	22	22	21	21	20	20
62°	9'	-	63°	30'	25	25	24	24	23	23	22	22	21	21	20
63°	30'	-	64°	55'	26	25	25	24	24	23	23	22	22	21	21
64°	55'	-	66°	24'	26	26	25	25	24	24	23	23	22	22	21
66°	24'	-	67°	57'	27	26	26	25	25	24	24	23	23	22	22
67°	57'	-	69°	35'	27	27	26	26	25	25	24	24	23	23	22
69°	35'	-	71°	21'	28	27	27	26	26	25	25	24	24	23	23
71°	21'	-	73°	16'	28	28	27	27	26	26	25	25	24	24	23
73°	16'	-	75°	24'	29	28	28	27	27	26	26	25	25	24	24
75°	24'	-	77°	52'	29	29	28	28	27	27	26	26	25	25	24
77°	52'	-	80°	56'	30	29	29	28	28	27	27	26	26	25	25
80°	56'	-	85°	45'	30	30	29	29	28	28	27	27	26	26	25
85°	45'	-	90°	0'	31	30	30	29	29	28	28	27	27	26	26

7 Error Messages

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

Error Message	Possible Cause	Corrective Measure
ADM defect	<ul style="list-style-type: none"> No data received from A/D converter 	<ul style="list-style-type: none"> Replace A/D converter
ADM Timeout	<ul style="list-style-type: none"> Short circuit in L/C cable EMC interference 	<ul style="list-style-type: none"> Check cabling Check cabling
ADM not Factory cal.	<ul style="list-style-type: none"> Calibration error 	<ul style="list-style-type: none"> Repeat calibration
Invalid Setupdata	<ul style="list-style-type: none"> ADM is defective 	<ul style="list-style-type: none"> Replace ADM
ADM not installed	<ul style="list-style-type: none"> ADM not installed ADM not correctly plugged in 	<ul style="list-style-type: none"> Install ADM Plug in ADM correctly
Calibration Locked	<ul style="list-style-type: none"> Jumper for protection of calibration parameters in position 'protected' 	<ul style="list-style-type: none"> Remove calibration jumper
Error Calibr. Jumper		
I/O Error	<ul style="list-style-type: none"> Interface error 	<ul style="list-style-type: none"> Check interface and replace module if required
Incline Sensor	<ul style="list-style-type: none"> Incline sensor signals error Inclination too big Inclination is defective 	<ul style="list-style-type: none"> Reduce inclination Replace inclination sensor
Not available	<ul style="list-style-type: none"> No scale selected 	<ul style="list-style-type: none"> Enable scale in Service Mode
Out of Range	<p>A/D converter out of range, because:</p> <ul style="list-style-type: none"> Wiring error in L/C connection L/C defective Scale heavily overloaded 	<ul style="list-style-type: none"> Check cabling and signal: ~ 0 – 10mVAC (signal) and excitation voltage: ~ 5VAC Check L/C Unload scale

Error Message	Possible Cause	Corrective Measure
O v e r l o a d -----	<ul style="list-style-type: none"> Scale in overload Zero setting or taring cannot be carried out because scale is in motion CPU does not receive data from scale interface 	<ul style="list-style-type: none"> Unload scale Settle scale Check external and internal cabling
U n d e r l o a d	Gross weight smaller than -20d (below zero)	<ul style="list-style-type: none"> Load scale Set parameter 'Underload 20d' to N= disabled
W1 Plug In	No data from scale interface	<ul style="list-style-type: none"> Check internal and external cabling
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 as set in the calibration ($\pm 2\%$, $\pm 10\%$).	<ul style="list-style-type: none"> Unload scale
Not In Zerorange		
Resolution Error	Internal resolution too small, must be at least tenfold the displayed resolution	<ul style="list-style-type: none"> Select bigger increment size Use L/C with lower capacity
Servicemode active	Device is set up as 'Remote Terminal' and Service Mode is active in the master terminal	<ul style="list-style-type: none"> Terminate Service Mode in the master terminal

7.1 Error Log Of Scale

Calibrate Scale 1	F1	View error log of scale
-------------------	----	-------------------------

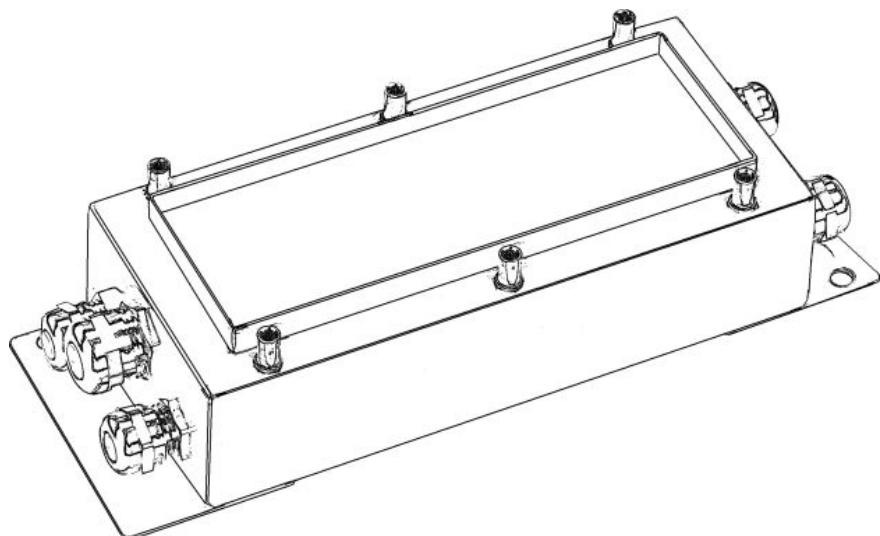
06.06.12 08:52	Ok
----------------	----

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

Technical Manual

JunctionBox



10ZUB458

February 2016

ST.2309.1517

Rev. 4

Technical Manual JunctionBox

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1 Introduction

1.1 About This Manual

This manual contains information and technical data for the use, the installation and the operation of the JunctionBox.

1.2 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.

Note:

- This indicates an advice for the intended use of the equipment and/or additional information to avoid inappropriate handling.

1.3 Safety Advice



W A R N I N G

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



W A R N I N G

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. All chapters of the Technical Manual must be observed.



W A R N I N G

For installation, service and operation of the unit, all locally applicable regulations for safety and prevention of accidents must be observed!

Notes:

- Disconnect all power to this instrument before cleaning and servicing!
- Keep this manual for future reference!

1.4 Declaration Of Conformity EU (only valid until April 19, 2016)

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



Konformitätserklärung

Declaration of conformity

Déclaration de conformité

Die JunctionBox
The JunctionBox
 Le JunctionBox

Hersteller: <i>Manufacturer:</i> Fabricant:	SysTec GmbH
Typ/Modell: <i>Type/Model:</i> Type/modèle:	JunctionBox

entspricht den Anforderungen der folgenden Richtlinien:
corresponds to the requirements of the following EC directives:
 correspond aux exigences des directives CE suivantes:

2004/108/EG 2004/108/EC 2004/108/CE

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

EN 61000-6-2:2005 EN 61000-6-4:2001

Unterschrift

Signature

Signature

Datum 26. Juni 2012

Date June 26, 2012

Date 26^{er} Juin 2012

Dipl.-Ing. Rainer Junglas
 Geschäftsführer
General Manager
 Directeur

2 Marking

Manufacturer	Systec Systemtechnik und Industrieautomation GmbH
	Ludwig-Erhard-Straße 6
	50129 Bergheim-Glessen
Designation	JunctionBox
Serial-No. SN	yyxxxxxx
Operating temperature range:	-10°C ... + 40°C
CE marking	
Service	Only by qualified service personnel, addresses on request.

3 Description

3.1 General Description

The shift adjust junction box is intended for connection to a supply circuit of a weighing terminal and the connection, excitation and cornering of up to 4 strain gauge loadcells.

The loadcells may be connected in 4- or 6-wire mode. The junction box is connected to the weighing terminal in 6-wire mode.

The shift adjust board of the JunctionBox features potentiometers to adjust the differences in weight of the individual corners. Shift adjust is enabled when the sliding switches are closed. To disable the shift adjust function the sliding switches must be open.

3.2 Housing

The housing of the JunctionBox is made of stainless steel. It has 4 M16x1.5 cable glands (4 - 8 mm) for loadcell cables and 1 M16x1.5 cable gland (5 - 10 mm) for the homerun cable to the weighing terminal.

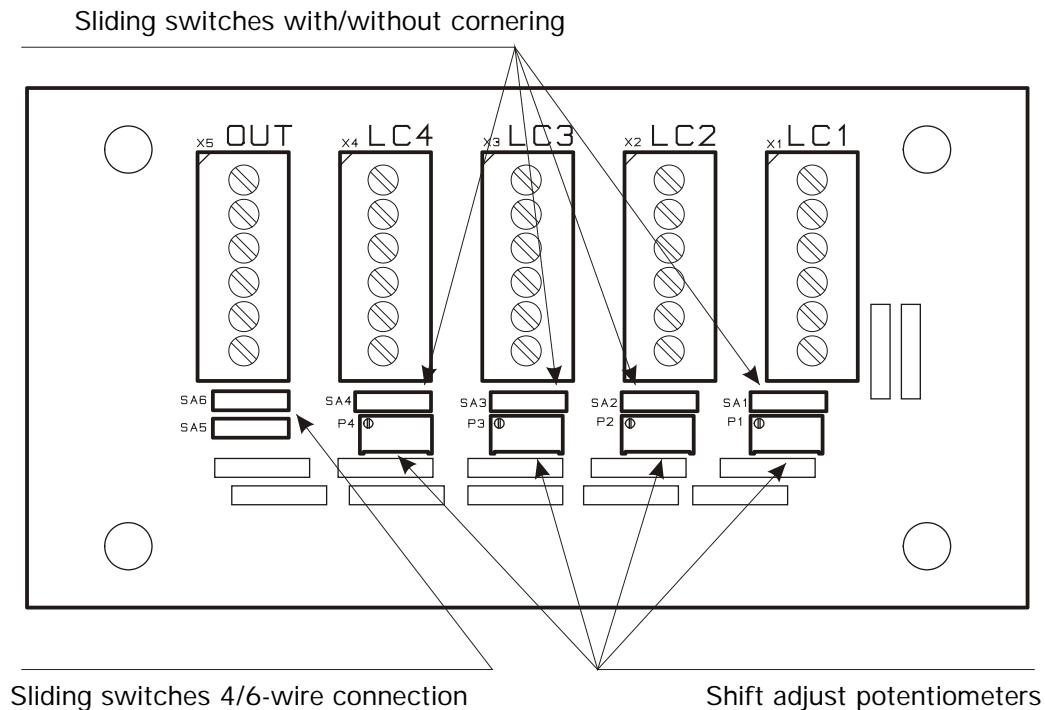
The housing is protected to IP67.

The housing must be included in the equipotential bonding of the installation with the bonding conductor connected at the M5 stud at the outside of the housing.

3.3 Shift Adjust Board

Incorporated in the housing is the shift adjust board ST.2300.0122.002.

- Up to 4 strain gauge loadcells can be connected at the screw terminals LC1 - LC4. At the terminal strip OUT the excitation circuit of the weighing terminal is connected.
- The potentiometers P1 - P4 are used to adjust the corners of the understructure. To that effect the sliding switches SA1 - SA4 must be closed.
- When loadcells are connected in 4-wire mode, the sliding switches SA5 - SA6 must be closed.



4 Intended Use

	<p>Any other but the intended use of the equipment, modifications and extensions must not be made without the explicit approval of the manufacturer and is deemed not to be intended. Part of the intended use is observance of this Technical Manual and the adherence to inspection and maintenance instructions and intervals. The manufacturer does not assume any liability whatsoever for damages resulting from non-intended use. Any risk resulting from non-intended use is solely borne by the user.</p>
	<p>By means of the M5 bolt, the metal housing of the JunctionBox must be connected to the equipotential bonding system of the installation.</p>
	<p>The connection values according to chapter "Technical Data" must be observed.</p>
	<p>The permissible temperature range is -10°C to $+40^{\circ}\text{C}$.</p>

5 Assembly

Assembly must be made in strict compliance with all applicable regulations and generally accepted engineering standards. In particular the special safety regulations for work on electrical systems must be observed.

The unit must be undamaged and the place of installation must be clean. For installation the device has mounting brackets with a 6 mm mounting hole each. It must be firmly installed by means of suitable mounting accessories that are not part of the delivery. All screws must be securely tightened.

The housing must be included in the equipotential bonding of the installation with the bonding conductor connected at the M5 stud provided.

Prior to commissioning, the lid of the housing must be closed and securely tightened with the hexagonal screws that are part of the shipment. The screws must be tightened with a torque of 1.2 Nm.

6 Installation

6.1 General

	This apparatus may only be installed by qualified personnel. This level of competence must correspond to the work that is to be carried out and appropriate training should be provided on a regular basis.
	Switch off the main switch and disconnect all power to the installation before carrying out any installation or maintenance work. Make sure that power cannot be switched on again. Installation work may only be carried out with all power sources disconnected.
	Installation must be carried out in compliance with applicable DIN/VDE regulations. Also, all country-specific regulations must be observed.
	All cables are led into the housing of the JunctionBox through glands. Use wire end ferrules on stranded cable and avoid protruding wires. When assembling the cable glands make sure that shield of cable is connected inside the cable gland (see also section 'Installation Of Cables').
	Prior to operating the device, the lid of the housing must be closed and secured against reopening with all hexagonal screws provided. The screws must be tightened with a torque of 1.2 Nm.

6.2 Equipotential Bonding

	The device must be integrated into the equipotential bonding of the installation. The bonding conductor must have a cross section of min. 4mm ² . To connect the bonding conductor, an M5 stud is provided at the housing.
--	---

6.3 Shielding

	Use only shielded connection cables. The shield must be connected at both sides in the cable glands. It is mandatory to additionally install equipotential bonding. The bonding conductor must have a cross section of min. 4mm ² .
---	--

6.4 Configuration For 4- or 6-Wire Mode

Disassemble lid of JunctionBox with 7 mm wrench.

To connect loadcells in 6-wire mode, sliding switches SA5 and SA6 must be open.

To connect loadcells in 4-wire mode, sliding switches SA5 and SA6 must be closed.

Number of wires in loadcell cable	Sliding switches SA5 and SA6	Function
6	open	with sense lines
4	closed	without sense lines

6.5 Connection Of The Loadcells

Disassemble lid of JunctionBox with 7 mm wrench. Install cables of loadcells LC 1 - LC 4 in M16x1.5 (4 - 8 mm) cable glands. Strip cable jacket as long as required for the free wires to reach the pertaining screw terminals LC 1 to LC 4. Use wire end ferrules on stranded cable. Make sure that shield of cable is connected inside the cable gland (see section 'Installation of cables').

The wires of the loadcell cable are connected as follows:

Terminal strip LC1 (loadcell 1):

Designation	Function
+ EXC	+ Excitation loadcell 1
-EXC	- Excitation loadcell 1
+ SEN	+ Sense loadcell 1
-SEN	- Sense loadcell 1
+ SIG	+ Signal loadcell 1
-SIG	- Signal loadcell 1

Terminal strip LC2 (loadcell 2):

Designation	Function
+ EXC	+ Excitation loadcell 2
-EXC	- Excitation loadcell 2
+ SEN	+ Sense loadcell 2
-SEN	- Sense loadcell 2
+ SIG	+ Signal loadcell 2
-SIG	- Signal loadcell 2

Terminal strip LC3 (loadcell 3):

Designation	Function
+ EXC	+ Excitation loadcell 3
-EXC	- Excitation loadcell 3
+ SEN	+ Sense loadcell 3
-SEN	- Sense loadcell 3
+ SIG	+ Signal loadcell 3
-SIG	- Signal loadcell 3

Terminal strip LC4 (loadcell 4):

Designation	Function
+ EXC	+ Excitation loadcell 4
-EXC	- Excitation loadcell 4
+ SEN	+ Sense loadcell 4
-SEN	- Sense loadcell 4
+ SIG	+ Signal loadcell 4
-SIG	- Signal loadcell 4

The following connection values must be observed:

Cross section of rigid wires:	0.14 – 1.5 mm ²
Cross section of stranded wires with wire end ferrules:	0.25 – 1.5 mm ²
Length of stripped wire:	6 mm
Torque of screw terminal:	0.5 – 0.6 Nm

6.6 Connection Of The Weighing Terminal

The cable from the supply circuit is connected through the M16x1.5 (5 - 10 mm) cable gland of the JunctionBox. Strip cable jacket as long as required for the free wires to reach the screw terminal OUT. Use wire end ferrules on stranded cable. Make sure that shield of cable is connected inside the cable gland (see section 'Installation of cables').

The wires of the cable are connected at the terminal strip OUT of the shift adjust board as follows:

Terminal strip OUT (supply circuit)

Designation	Function
+ EXC	+ Excitation
-EXC	- Excitation
+ SEN	+ Sense
-SEN	- Sense
+ SIG	+ Signal
-SIG	- Signal

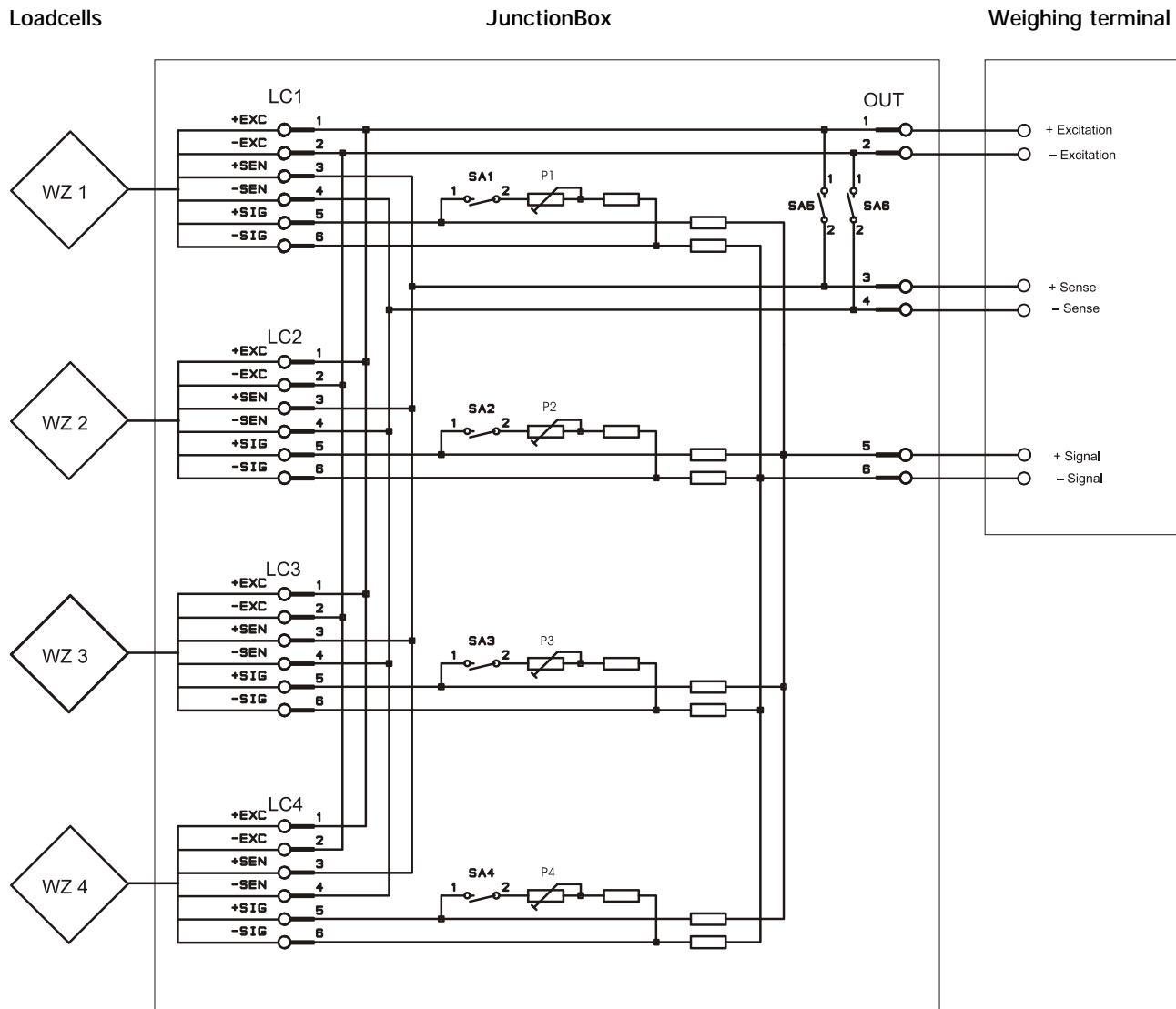
The following connection values must be observed:

Cross section of rigid wires:	0.14 – 1.5 mm ²
Cross section of stranded wires with wire end ferrules:	0.25 – 1.5 mm ²
Length of stripped wire:	6 mm
Torque of screw terminal:	0.5 – 0.6 Nm

After connecting all cables, close lid with the M4 hexagonal screws provided and fasten with a torque of 1.2 Nm.

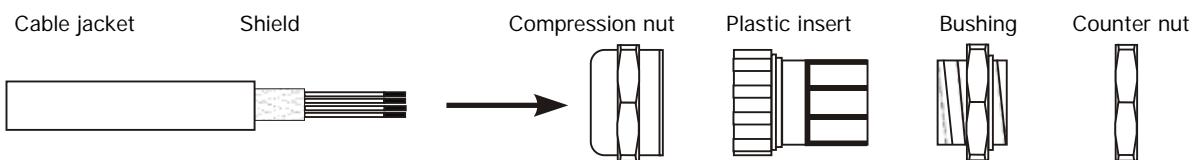
6.7 Installation Example

Shown below is a typical configuration:

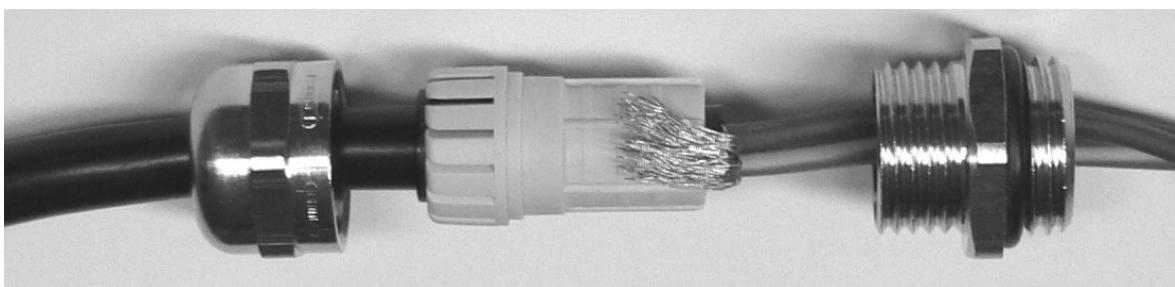


6.8 Installation Of Cables

All cables are led into the housing 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 to ensure good conductive contact with housing. Cut wires of shield to length of comb, avoid protruding wires that would endanger tightness of cable gland;



4. Insert retainer with cable into bushing;
5. Screw compression nut onto bushing and use wrench to tighten securely.

Permissible diameter of cable and torque for cable glands:

Type of cable gland	Size of wrench for compression nut	Permissible diameter of cable	Torque of compression nut
M16x1.5 (5 - 10 mm)	20 mm	5 – 10 mm	5 Nm
M16x1.5 (4 - 8 mm)	17 mm	4 – 8 mm	6 Nm

For deviating diameters of cable contact SysTec service.

	Use crimped wire end ferrules with plastic collar on stranded cables and avoid protruding wires!
	All connection cables must be firmly installed to avoid tensile strain at the cable glands.

7 Commissioning

7.1 General

Prior to start up follow the check list below:

	Check whether the conditions concerning the intended use are fulfilled (see section 'Intended Use').
	Check assembly as described in section 'Assembly'.
	Check of installation (equipotential bonding, connection of external components) as described in chapter 'Installation'.
	Check that housing is properly closed with all hexagonal screws securely tightened with a torque of 1.2 Nm.
	Switch on the connected weighing terminal.

8 Operation

The JunctionBox does not have any control elements and does not require any operator interaction. It is a firmly installed part of the weighing installation. Operation of the installation is made at the connected weighing terminal.

The procedure for shift adjust is described in section 'Shift Adjust Procedure'.

9 Shift Adjust Procedure

The JunctionBox has 4 potentiometers which are used to adjust the 4 corners of a weighing platform.

Assignment of loadcells, potentiometers and sliding switches:

Loadcell	Terminal strip	Potentiometer	Sliding switch
1	LC1	P1	SA1
2	LC2	P2	SA2
3	LC3	P3	SA3
4	LC4	P4	SA4

By default the sliding switches SA1 - SA4 are open. In this position shift adjust is disabled.

How to carry out the shift adjust procedure:

- Disconnect all power sources to the installation.
- Open lid of housing with suitable tool.
- Close sliding switch SA1 - SA4 (position 'ON').
- Turn potentiometers P1 - P4 clockwise to end (in end position you can hear a light clicking noise).
- Switch on weighing terminal.
- Calibrate scale.
- Load corners of platform one after the other with the same test weight (approx. 25% of capacity) to determine corner with the lowest reading. This corner #1 is not changed anymore and serves as reference for the others.
- Adjust the remaining three corners as follows:
 - Put test weight on corner;
 - Turn pertaining potentiometer counter clockwise until the lower weight reading of corner #1 is reached.
- Check all corners, if necessary repeat procedure until all corners are within permissible limits.
- Check full capacity of scale, it might be required to repeat calibration to full load after shift adjust.
- After completing the shift adjust procedure close lid of JunctionBox and tighten screws securely with a torque of 1.2 Nm.

10 Transport, Maintenance And Cleaning

10.1 Transport

Note:

- Transport and storage of the weighing terminal must only be made in designated cardboard box.
- Do not expose the unit to extreme temperatures, humidity, shocks or vibrations.
- Storage temperature 0 to + 70°C at 95% max. relative humidity without condensation

10.2 Maintenance



Maintenance at regular intervals must be carried out by qualified personnel (see chapter 'Installation'). At these inspections first of all it must be made sure that the housing is tight, all cables are undamaged and all screws are securely fastened.

Maintenance of the connected scale platform 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.

10.3 Cleaning

Clean the unit with a soft clean cloth that has been dampened with a mild window type cleaner. Do not spray cleaner directly on the unit. Concentrated leaches or acids or pure alcohol must not be used. If cleaning agents are used that contain leach, acid or alcohol, pure water must be used to wash off any residue. The unit is protected to IP67.

10.4 Security Check



Safe operation is no longer warranted if:

- Housing is damaged.
- Connected cables, cable entry or equipotential bonding are damaged.

In these cases disconnect all power to the unit and contact your service station.

10.5 Functional Test

The functionality of the JunctionBox is tested with test weights during the calibration of the scale and the shift adjust procedure.

10.6 Repair



Immediately disconnect a damaged unit from all power sources.

Only qualified service personnel (see chapter 'Installation') may carry out repair work using genuine factory supplied spare parts.

10.7 De-Installation



1. Disconnect all power sources to the installation.
2. Open lid with suitable tool.
3. Remove cabling.
4. Use suitable tools to de-install JunctionBox.

10.8 Disposal

For the disposal of the unit all country-specific and locally applicable regulations must be observed!

11 Trouble Shooting



The JunctionBox does not contain any customer serviceable parts!

Only qualified service personnel (see chapter 'Installation') may carry out repair work using genuine factory supplied spare parts.

If any problem arises, please follow this check list:

- Disconnect the unit from all power sources.
- Check whether all cables including cable glands are undamaged.
- Check whether housing is undamaged.

If operational difficulties are encountered that cannot be rectified by means of this manual, obtain as much information as possible regarding the particular trouble.

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:

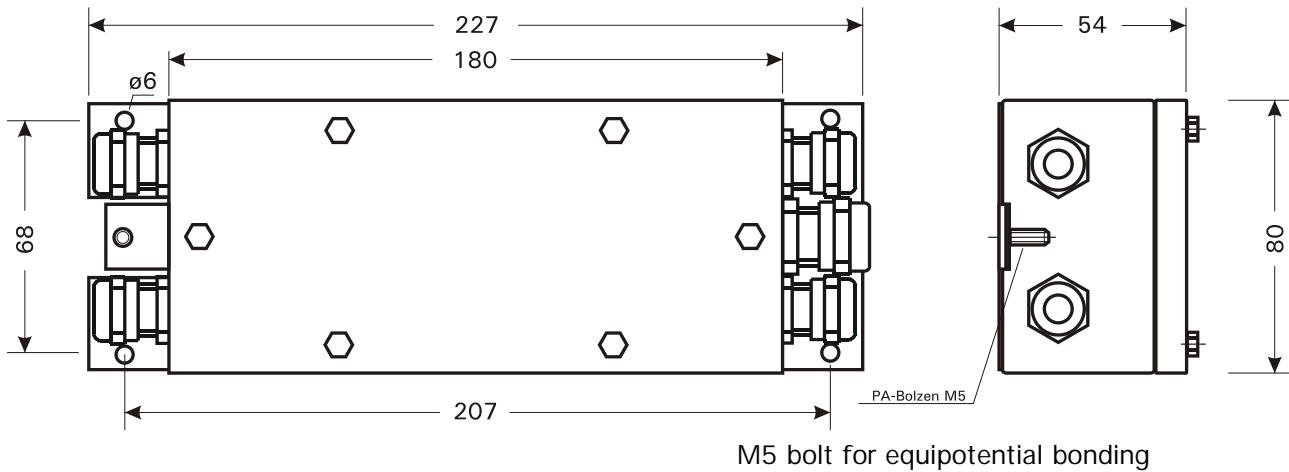
- Serial-No. of the unit.
- Exact wording of any error message shown on the display of the connected weighing terminal.
- Type and model of the weighing terminal.

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

12 Technical Data

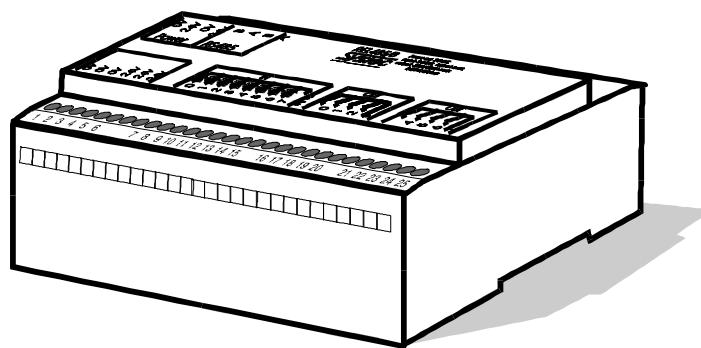
Housing	Stainless steel housing with mounting flange and 5 cable glands
Ingress protection	IP67
Weight	0.75 kg
Temperature range storage	0 °C to + 70 °C at 95 % rel. humidity, non-condensing
Temperature range operation	-10 °C to + 40 °C at 95 % rel. humidity, non-condensing
Max. surface temperature	50°C
Min. Loadcell resistance X1-X4 (LC1-4)	200 Ohm each Loadcell
Connection values X5 (OUT)	$U_N = 0 - 20 \text{ V}$ $I_N = 0 - 0.4 \text{ A}$

13 Dimensions



Installation Instructions

REL485 / TRIO485



RS485 Relay / Transistor Unit

February 2016

ST.2309.0047

Rev. 15

Installation Instructions REL485 / TRIO485

Date: February 05, 2016

File: REL_TRIO_IAE.DOC

Published By:

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1 Introduction

1.1 Applications

The RS485 Relay/Transistor Module is used in combination with a weighing terminal for the input and output of digital signals. Typical applications are switching on/off solenoid valves, pilot lamps and motor control centers. Via the optoisolated inputs, push buttons, switches and sensors can be connected.

1.2 Documentation

In addition to this manual, further information is provided in the following technical manuals:

- IT2000M, Order-No. ST.2309.1640
- IT3000M, Order-No. ST.2309.1501
- IT4000E, Order-No. ST.2309.1193
- IT6000E, Order-No. ST.2309.1204
- IT6000ET, Order-No. ST.2309.1476
- IT8000E, Order-No. ST.2309.1188
- IT8000ET, Order-No. ST.2309.1472
- IT9000E, Order-No. ST.2309.0813
- IT9000, Order-No. ST.2309.0019
- IT8000, Order-No. ST.2309.0426
- IT6000, Order-No. ST.2309.0799
- TS3000, Order-No. ST.2309.0769

1.3 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 correct operation of the equipment and additional information to avoid inappropriate handling.

1.4 Safety Advice



WARNING

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.



CAUTION

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



CAUTION

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



CAUTION

- For the power supply of the RS485 relay/transistor module an external power supply unit is required providing 24 VDC SELV voltage in compliance with EN60950.



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!

- Read this manual carefully before you operate this module!
- Keep this manual for future reference!

1.5 Technical Data

The RS485-Relay/Transistor Module is connected serially via an RS485 interface to the IT9000/ IT6000 weighing terminal. The module is installed in a switch cabinet on a C-rail. A maximum number of 8 modules can be addressed via one RS485 interface.

	REL485 Relay Module	TRIO485 Transistor Module
8 inputs	Optoisolated 24V inputs, common IN – connection Low level: 0 – 2 VDC High level: 19.5V – 30 VDC	
8 outputs	Relay output, electrically isolated, 24VDC/2A or 250VAC/2A, N/O-contact, 4 each with one common connection	Transistor output, optoisolated, 24VDC/1A, 4 each with one common L+ connection
max. switching frequency of outputs	10Hz	100Hz
power supply	$U_{in} = 24VDC$ $I_{in} = 100 \text{ mA}$ (without load on outputs) For the power supply, an external SELV power supply unit is required in compliance with EN60950.	
Serial interface RS485-2-wire	To connect to weighing terminal IT6000/IT8000/IT9000 and up to 7 additional relay/transistor modules, signal transmission time approx. 3 msec, max. cable length: 1000 m	
Serial interface RS485-4-wire	To connect to weighing terminal IT4000E / IT6000E / IT8000E / IT9000E and to separating module TS3000 in safe area and up to 7 additional relay/transistor modules, signal transmission time approx. 3 msec, max. cable length: 1000 m. (Only REL485 index 007 and TRIO485 index 005 or higher.)	
Status indication of I/Os	LEDs for state of 8 inputs and 8 outputs	

2 Declaration Of Conformity EU (only valid until April 19, 2016)

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



Konformitätserklärung *Declaration of conformity* *Déclaration de conformité*

Das Relais- / Transistormodul

The relay / transistor module

Le couplage de relais / transisteurs

Hersteller: <i>Manufacturer:</i> Fabricant:	SysTec GmbH
Typ/Modell: <i>Type/Model:</i> Type/modèle:	REL 485 / TRIO 485

entspricht den Anforderungen der folgenden Richtlinien:

corresponds to the requirements of the following EC directives:

correspond aux exigences des directives CE suivantes:

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

entsprechend den folgenden Normen/Empfehlungen:

in conformity with the following standards:

conforme aux normes suivantes:

EN 61000-6-4:2007 EN 60950-1:2006	EN 61000-6-2:2005
--------------------------------------	-------------------

Unterschrift

Signature

Signature

Datum:

24.02.2011

Date:

February 24, 2011

Date:

24.02.2011

Dipl.-Ing. Rainer Junglas

Geschäftsführer / General Manager / Directeur

3 Installation

3.1 RS485 4-Wire Interface In Weighing Terminal IT4000E / IT6000E / IT8000E / IT9000E

The RS485 interface module SIM RS485-4-wire or SIM RS485-Opto is installed in one of the sockets **SIM1 or SIM2** (in the IT9000E terminal also in **SIM3**), (see also Technical Manual of weighing terminal).

Note: In the IT9000E terminal the sockets SIM1-SIM2 can alternatively be used for the SIM RS485-2-wire module.

3.2 RS485-2-Wire Interface In Weighing Terminal IT6000 / IT8000 / IT9000

The RS485 interface module SIM RS485-2-wire or SIM RS485-Opto is installed in one of the sockets **SIM1 or SIM2** (in the IT9000 terminal also **SIM3**).

In the IT6000 terminal the sliding switch for the interface COM1 or COM2 must be set to RS485 (see also Technical Manual IT6000).

In the IT6000A/2006 terminal the RS485 interface module SIM RS485-2-wire or SIM RS485-Opto is installed in one of the sockets **SIM1 or SIM2** (see also Technical Manual IT6000A/2006).

In the IT9000 terminal jumpers must be plugged into pin row W1 and W2 next to the screw terminals **in the middle position** (see also Technical Manual IT9000).

3.3 RS485-4-Wire Interface In TS3000 Separating Module

A separating module TS3000 with RS485.4 interface must be used. All components must only be installed in safe area (see also Technical Manual TS3000).

3.4 Service Mode Parameters Of Weighing Terminals IT4000E / IT6000E / IT8000E / IT9000E

The digital I/O modules are controlled via the 'DeviceBus' protocol. Mixed mode operation together with analog I/O modules (MAI) and the ADCBox is possible.

For the communication with an RS485 module, the option 'REL/TRIO' must be chosen in Service Mode, group 'Configuration IO', for the corresponding interface 'SIM1', 'SIM2' or 'SIM3' (IT9000E only).

In Service Mode group 'Interface' the parameters of the COM interface used for the RS485 communication must be set to 19200 baud, 8 data bits, odd parity, no control, no protocol.

3.5 Service Mode Parameters Of Weighing Terminals IT6000 / IT8000 / IT9000

The digital I/O modules are controlled via the 'DeviceBus' protocol. Mixed mode operation together with analog I/O modules (MAI) and the ADCBox is possible.

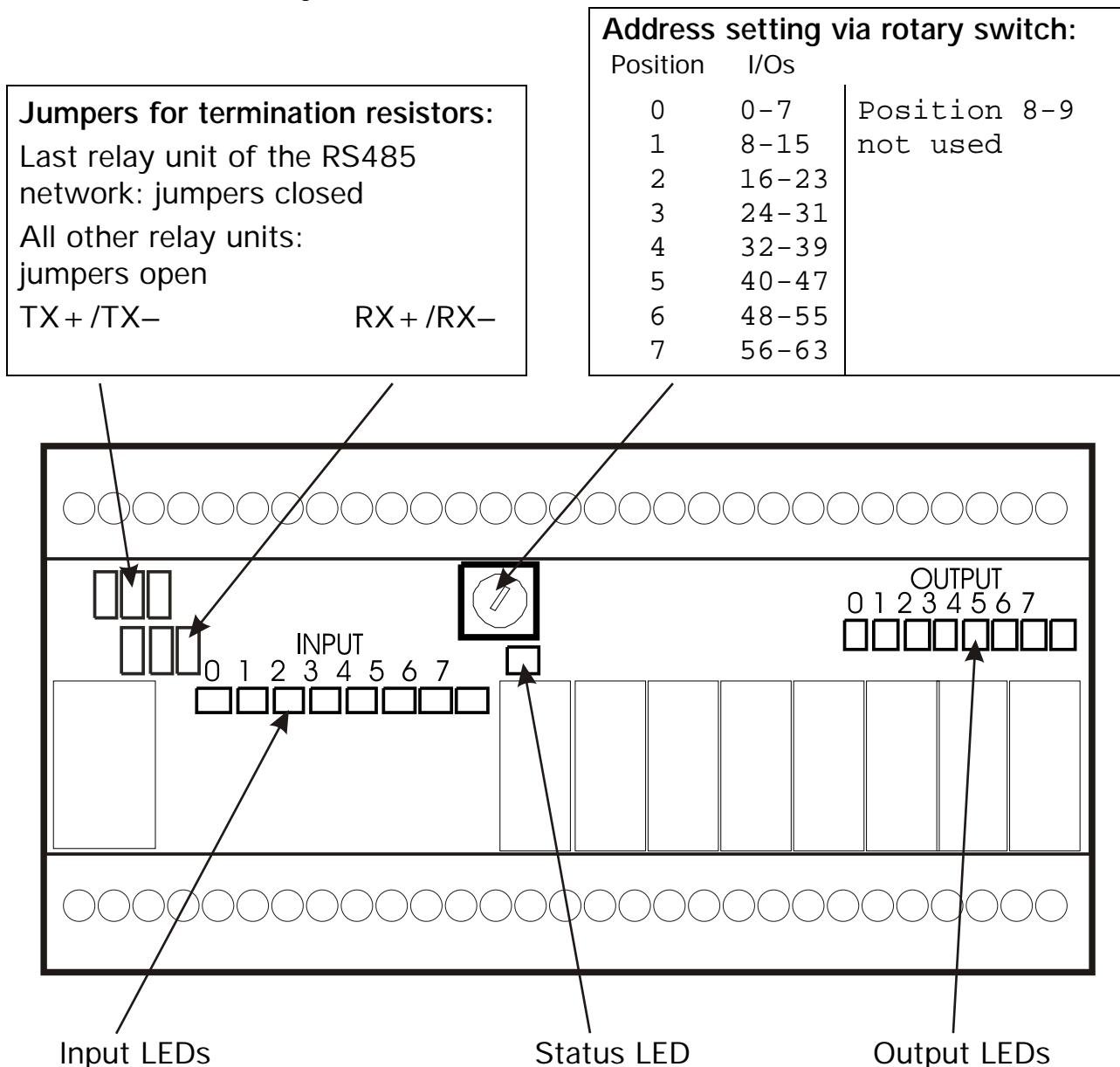
To connect RS485 REL/TRIO modules the option 'DeviceBus' must be selected for the chosen interface (COM1 or COM2) of the weighing terminal. Die Parameters for COM1 or COM2 (or COM3 for IT8000) must be set in Service Mode as follows: 19200 baud, 8O, HDX, ext. bus, I/O-Module, DeviceBus.

3.6 Settings For Relay/Transistor Module

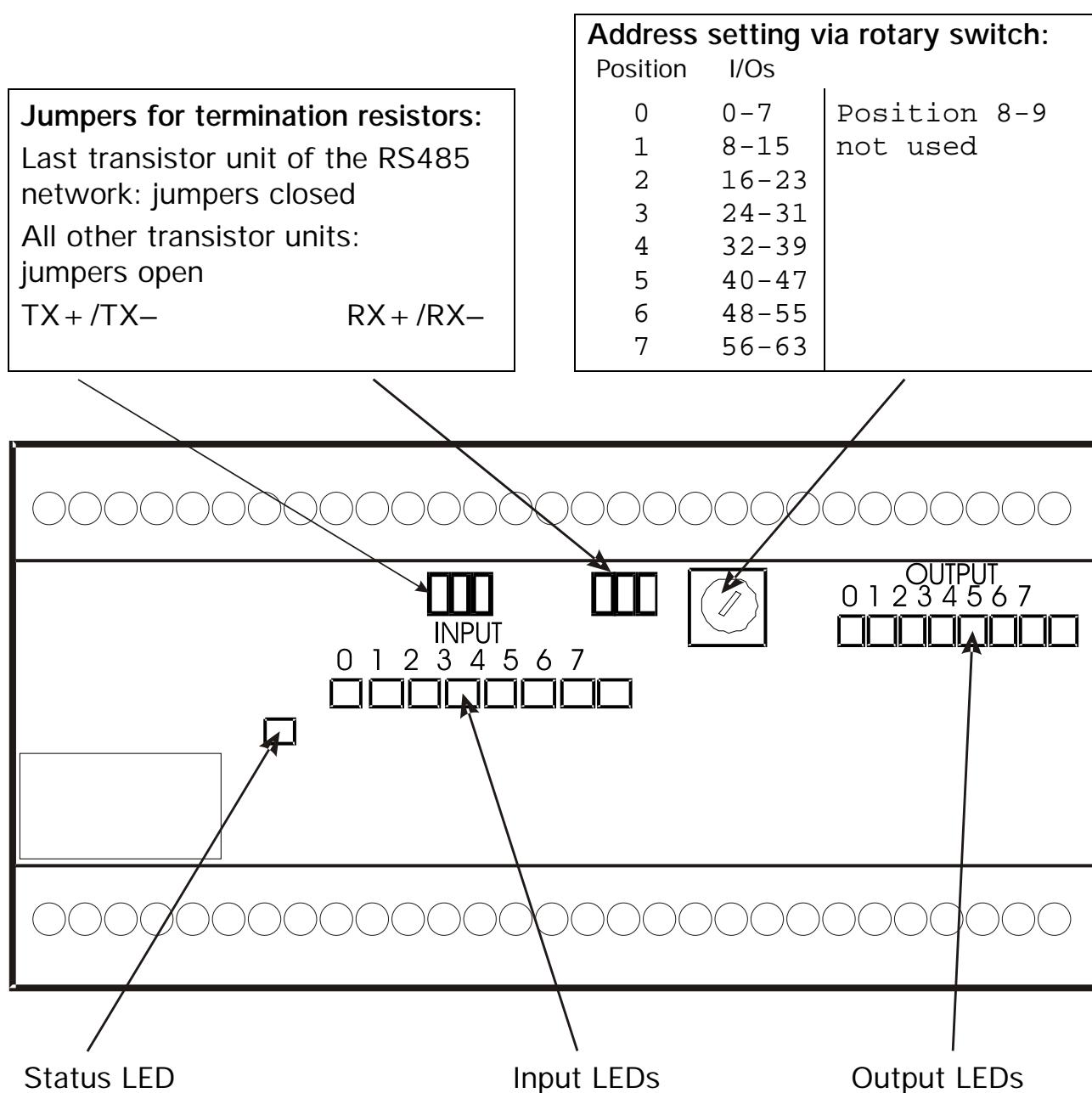
Addresses of the connected modules are set beginning with address 0 up to address 7. Termination resistors are connected by means of jumpers on modules which are installed at a physical end of the RS485 network.

Note: Even if PIM modules are installed in the weighing terminal, the addresses of the relay modules always start with the zero position of the rotary switch.

3.6.1 REL485 Relay Module



3.6.2 TRIO485 Transistor Module



3.7 Connection

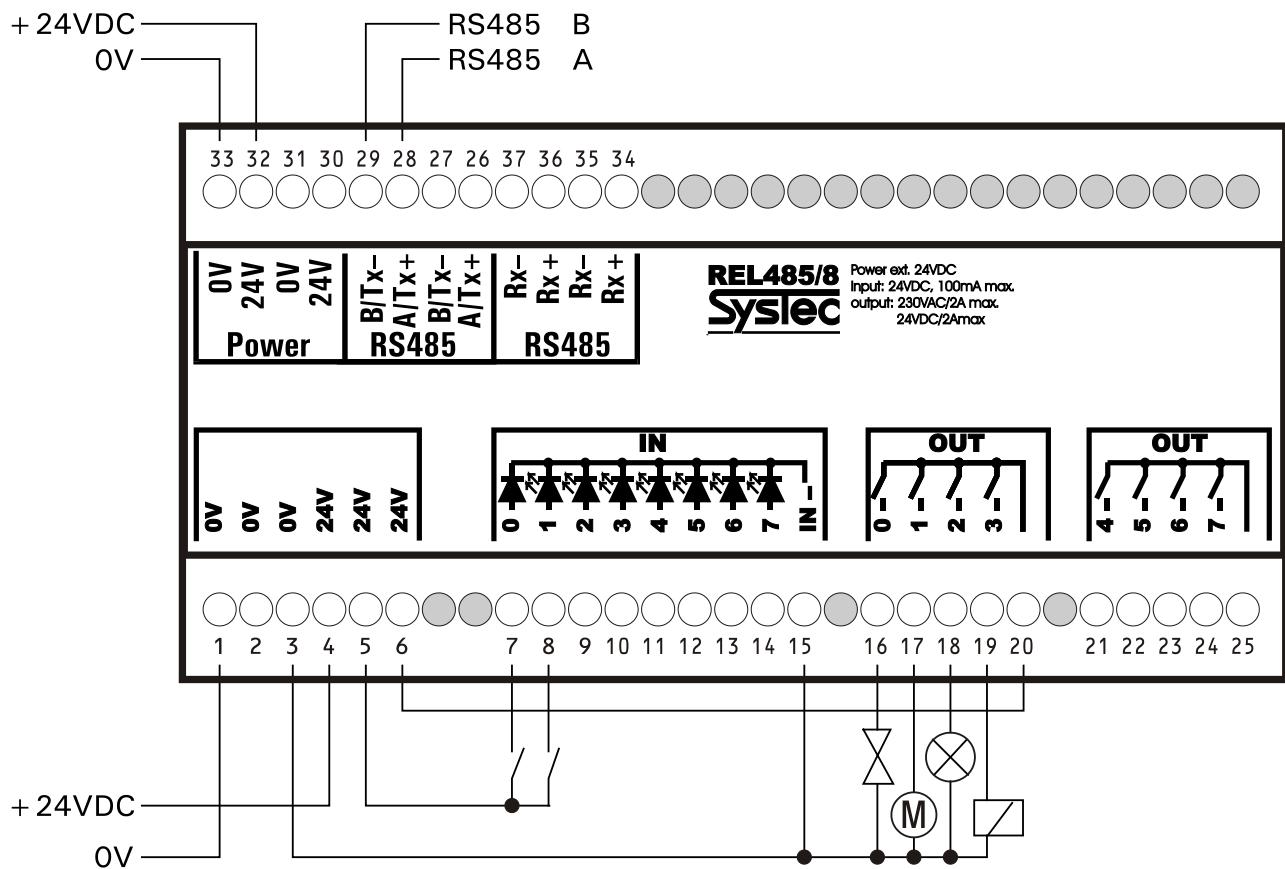
- Connect the **Inputs** (switches, push buttons, ...) to IN0 - IN7. Use only SELV voltages in compliance with EN 60950. Gauge: min. 0.25mm². The 24VDC and 0V(24V) outputs can be used as power supply for the inputs.
- Connect the **Outputs** (valves, relays, ...) to OUT0 - OUT7. Use recovery diodes or RC circuits for all connected inductive loads. Applying 24VDC instead of 230VAC to the output relay contacts extends their life time. Optionally the 24VDC and 0V(24V) outputs can be used as power supply for the outputs.
- Connect the **RS485** network cable to terminals A and B (2-wire interface) or Tx+ /Tx-/ Rx + /Rx- (4-wire interface). Gauge: min. 0.25mm². If an I/O unit is installed at a physical end of the RS485 network, activate pull-up, pull-down- and termination resistors by closing the corresponding jumpers.
- Connect the **cable shield** to ground potential at both cable ends. One end of the screen to be connected to the housing of the terminal via cable gland. The other end of the shield to be connected to ground at the Relay/ Transistor Unit cabinet.
Note: If ground on the two ends of the cable has different potential, a separate earth link of appropriate diameter is required to avoid the shield conducting an equalization current.
- Connect **24VDC** power supply (SELV power supply unit compliant to EN 60950) at terminals 24V and 0V (top row). Power consumption: 100mA (without load on the outputs).

Note:

- As of index 6 of the REL485 module the terminals 'Power 24V / 0V' (at the top) are not internally connected any more to the terminals '24V / 0V' (I/Os at the bottom) and the power supply for the I/Os must be connected separately.
- Also, as of index 6, varistors (voltage dependent resistors) are connected in parallel to the relay contacts to improve noise immunity.
- As of REL485 index 007 and TRIO485 index 005 apart from the RS485 2-wire interface, also an RS485 4-wire interface is available for the connection of the TS3000 separation module.

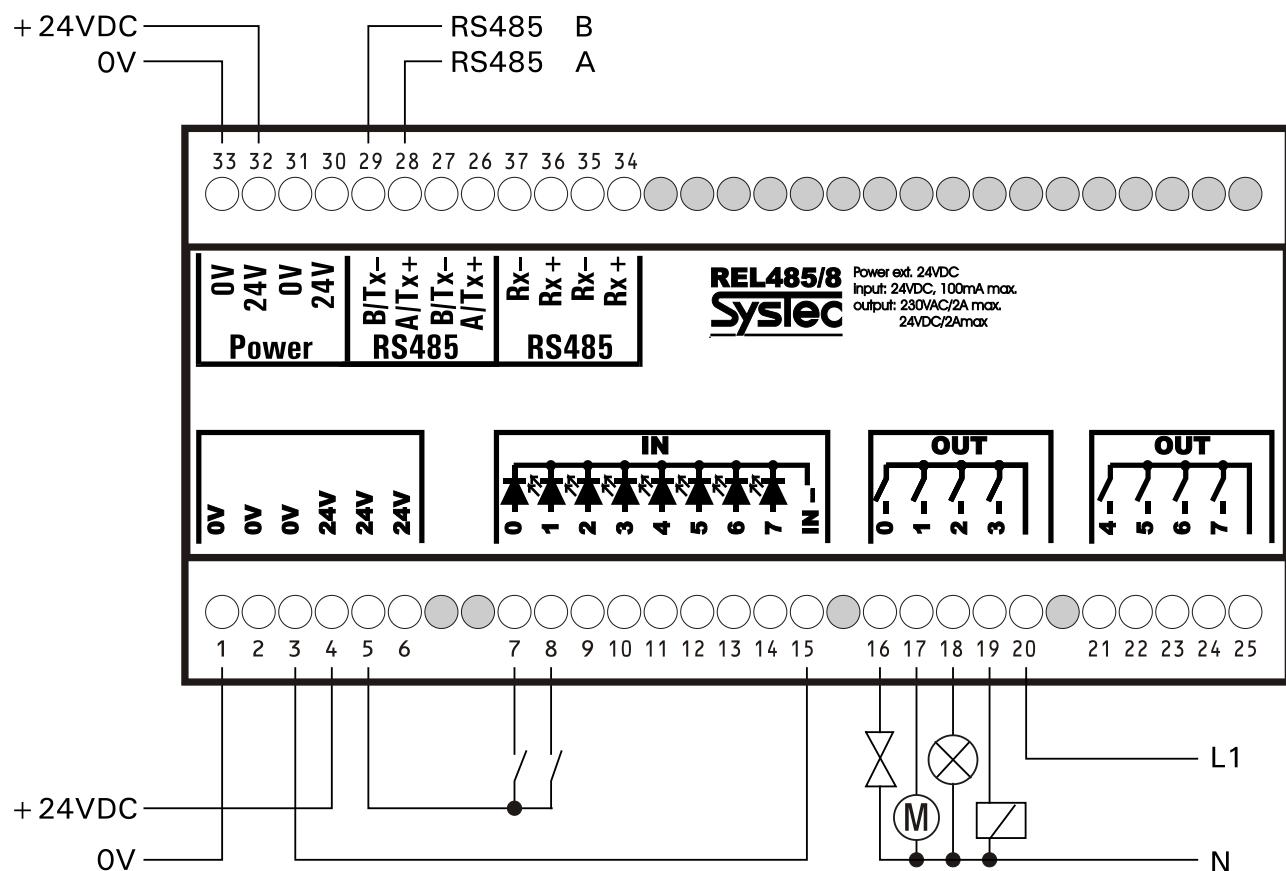
3.8 Wiring Schematics (Examples)

3.8.1 REL485 Relay Module (Outputs Connected To 24VDC)



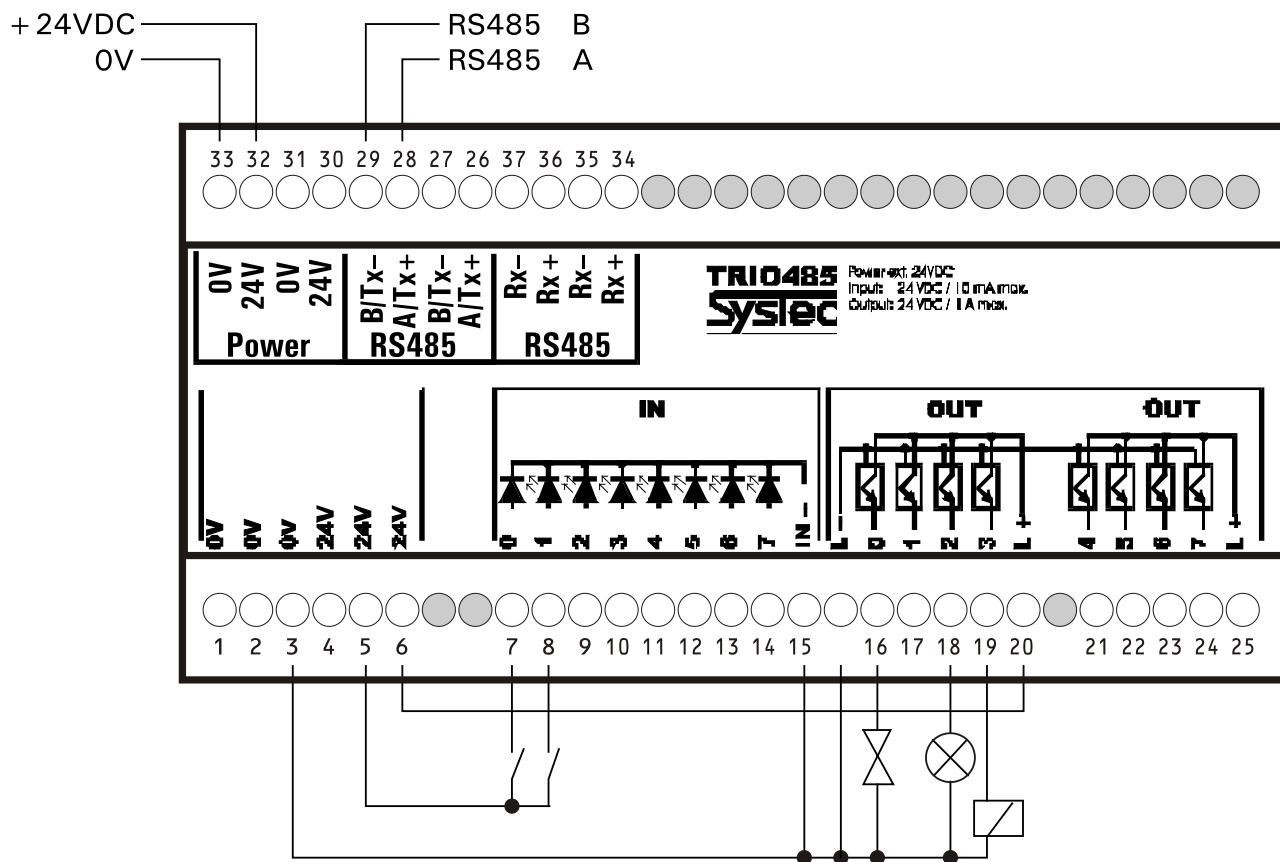
Terminal	Description
1	Power supply (I/Os) 0V
4	Power supply (I/Os) + 24VDC
28	RS485 A
29	RS485 B
32	Power supply + 24VDC
33	Power supply 0V

3.8.2 Relay Module (Outputs Connected To 230VAC)



Terminal	Description
1	Power supply (inputs) 0V
4	Power supply (inputs) + 24VDC
28	RS485 A
29	RS485 B
32	Power supply + 24VDC
33	Power supply 0V

3.8.3 TRIO485 Transistor Module



Terminal	Description
28	RS485 A
29	RS485 B
32	Power supply + 24VDC
33	Power supply 0V

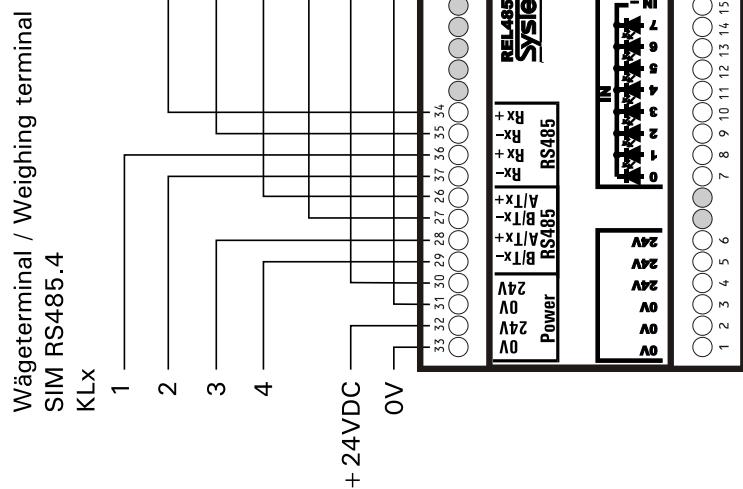
3.9 Wiring Schematics 4-Wire Interface For Weighing Terminal IT4000E / IT6000E / IT8000E / IT9000E

Example: RS485-4-wire connection of two relay modules to weighing terminal. It is important to activate the termination and pull-up / pull-down resistor at the last module on the bus by means of the jumpers provided. At all other modules on the bus these jumpers must remain open. For cable lengths exceeding 10m, also termination resistors of 150 W each must be installed at the screw terminals of the TS3000 between Tx+ and TX-, and also between Rx+ and Rx- in parallel to the bus cable.

1.Unit	Power supply
32	+ 24VDC
33	0V

1.Unit	Weighing terminal SIM RS485.4 KLx
29	4 (RxD-)
28	3 (RxD+)
37	2 (TxD-)
36	1 (TxD+)

1.Unit	2.Unit
31	33
30	32
35	37
34	36
27	29
26	28



Note: 1.Unit: Jumpers for termination resistors: open
2.Unit: Jumpers for termination resistors: closed

3.10 Wiring Schematics 2-Wire Interface For Weighing Terminal IT6000/IT8000/IT9000

Example: IT9000 with two relay modules. Transistor modules are wired following the same principle.

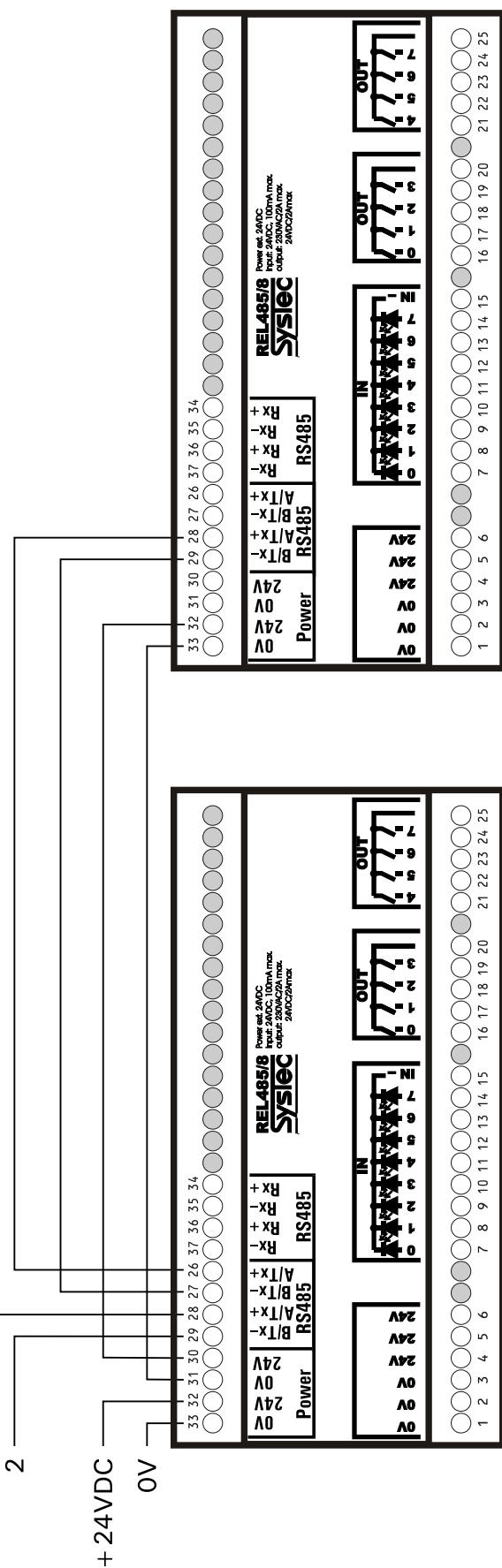
It is important that the jumpers to connect pull-up-, pull-down- and termination resistors are set on the last module on the network, and that all the others are open. For a cable length ³ 10m, a 150 W termination resistor must also be connected at terminals A and B of the weighing terminal.

1. Unit	Power supply
32	+ 24VDC
33	0V

1. Unit	Weighing terminal SIM RS485.2 KLx
28	1 (A)
29	2 (B)

1. Unit	2. Unit
31	33
30	32
27	29
26	28

Wägeterminal / Weighing terminal
SIM RS485.2
KLx



Note: 1. Unit: Jumpers for termination resistors: open
2. Unit: Jumpers for termination resistors: closed

3.11 Wiring Schematics 4-Wire Interface For TS3000

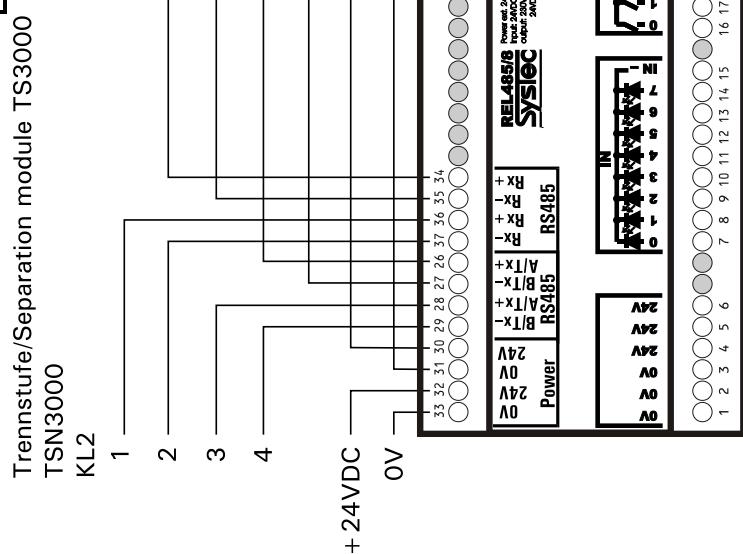
Example: RS485-4-wire connection of two relay modules to separating module TS3000. An RS485 4-wire interface must be used in the TS3000. All components must be installed in safe area.

It is important to activate the termination and pull-up / pull-down resistor at the last module on the bus by means of the jumpers provided. At all other modules on the bus these jumpers must remain open. For cable lengths exceeding 10m, also termination resistors of 150 W each must be installed at the screw terminals of the TS3000 between Tx+ and TX-, and also between Rx+ and Rx- in parallel to the bus cable.

1.Unit	Power supply
32	+ 24VDC
33	0V

1.Unit	Separation module TS3000 TSN3000 KL2
29	4 (RxD-)
28	3 (RxD+)
37	2 (TxD-)
36	1 (TxD+)

1.Unit	2.Unit
31	33
30	32
35	37
34	36
27	29
26	28



Note: 1.Unit: Jumpers for termination resistors: open
2.Unit: Jumpers for termination resistors: closed

3.12 Functional Test

Please check installation before operating the relay/transistor modules. Refer to the following check list.

3.12.1 Connection To Weighing Terminals IT4000E / IT8000E / IT9000E

- SIM RS485-4-wire or SIM-RS485-OPTO installed in socket SIM1 or SIM2 (in IT9000E also SIM3)?
- In Service Mode group 'Configuration IO' option 'REL/TRIO' chosen and the corresponding interface 'SIM1', 'SIM2' or 'SIM3' (only IT9000E) selected?
- Are the parameters for the DeviceBus of the COM interface used for RS485 communication set in the Service Mode to 19200 baud, 8 data bits, odd parity?
- Pull-up resistors installed at all physical ends of the RS485 network?
- Addresses of the Relay/Transistor Units set in rising order, starting with 0?
- Wiring of RS485.4 interface correct?
- For REL485 (Index 6 and higher): separate power supply connected for inputs and outputs?

If your answer to all questions of the check list is Yes and it has been made sure that the installation was carried out in strict compliance with all applicable local safety regulations and the rules for prevention of accidents, you can start the test.

When the weighing terminal and the I/O-Unit(s) are switched on, the LED 'Ready' indicates that the communication between terminal and I/O unit is running.

In Service Mode, group 'Test' choose option 'Parallel IO'. Here the relay/transistor modules 1 to 8 can be tested one after the other. The state of the inputs and outputs is shown. Outputs can be set / reset with the numeric keys 0 to 7.



W A R N I N G

Exercise utmost care when setting outputs that control conveyors or feeders or any other moving parts. Make sure that all personnel is out of reach of any moving parts. Failure to observe this precaution could result in bodily injury!

3.12.2 Connection To IT6000 / IT8000 / IT9000 Weighing Terminals

- SIM-RS485 2-wire or SIM-RS485-OPTO mounted as SIM1 or SIM2 (IT9000), SIM RS485 mounted as SIM1 to SIM3 (IT8000), or slide switch in RS485 position (IT6000)?
- IT9000 jumpers for SIM1 or SIM2 in middle position?
- IT9000: COM1 or COM2 (IT8000: COM1 to COM3) in Service Mode set to: 19200 Baud, 8O, HDX, Ext.Bus, I/O-Module, DeviceBus?
- Pull-up resistors installed at all physical ends of the RS485 network?
- Addresses of the Relay/Transistor Units set in rising order, starting with 0?
- Wiring of RS485.2 interface correct?
- For REL485 (Index 6 and higher): separate power supply connected for inputs and outputs?

If your answer to all questions of the check list is Yes and it has been made sure that the installation was carried out in strict compliance with all applicable local safety regulations and the rules for prevention of accidents, you can start the test.

When the weighing terminal and the I/O-Unit(s) are switched on, the LED 'Ready' indicates that the communication between terminal and I/O-Unit is running.

Select Service Mode, group 6 (Hardware Test), Test 2 (Test Inputs / Outputs). The Relay/Transistor Modules 1...8 are selected by pressing the function keys F1...F8. The status of all inputs and outputs of the selected I/O unit is displayed. The outputs can be switched on or off by pressing the keys 1...8 (e.g. press 1 once to switch the first output on, press 1 again to switch it off).



W A R N I N G

Exercise utmost care when setting outputs that control conveyors or feeders or any other moving parts. Make sure that all personnel is out of reach of any moving parts. Failure to observe this precaution could result in bodily injury!

3.12.3 Connection To Separation Module TS3000

- TS3000 fitted with RS485.4 interface?
- Termination resistors installed at all physical ends of the RS485 network?
- Addresses of the Relay/Transistor Units set in rising order, starting with 0?
- Wiring of RS485.4 interface correct?
- For REL485 (Index 6 and higher): separate power supply connected for inputs and outputs?
- Separating Module TS3000 and relay/transistor modules installed in safe area?
- All safety advices adhered to for separating module TS3000 and the connected weighing terminal IT3000Ex / IT8000Ex?
- No potentially explosive atmosphere present?

If your answer to all questions of the check list is Yes and it has been made sure that the installation was carried out in strict compliance with all applicable local safety regulations and the rules for prevention of accidents, you can start the test.



W A R N I N G

Exercise utmost care when setting outputs that control conveyors or feeders or any other moving parts. Make sure that all personnel is out of reach of any moving parts. Failure to observe this precaution could result in bodily injury!

3.13 Address Of Inputs/Outputs

If the SINEC L2 protocol is selected in the Service Mode of the weighing terminal, the addresses of the relay/transistor unit inputs and outputs range from 0 to 63.

IT9000 only: by selecting SINEC L2 protocol, the inputs and outputs of the IT9000 CPU and IFU are shifted to 64 to 79.

3.14 Errors

In the case of a transmission error between weighing terminal and I/O module, the outputs of all relay/transistor units are reset after a timeout of 1 second. The LED 'Ready' is switched off. The terminal display shows the error message 'I/O Error'.

4 Terminal Assignment

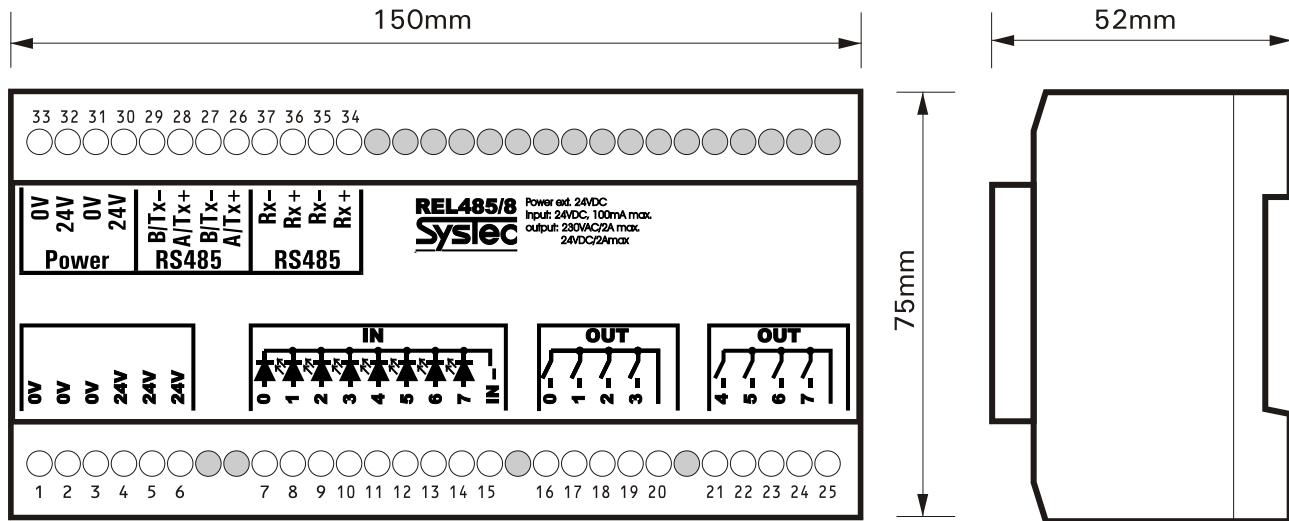
Power Supply and RS485 Interface

Terminal	Assignment
Power OV	Power supply; 0V(24VDC)
Power 24V	Power supply; + 24VDC
A	RS485 2-wire interface: TX+ / RX+
B	RS485 2-wire interface: TX- / RX-
Tx+	RS485 4-wire interface: positive transmit line
Tx-	RS485 4-wire interface: negative transmit line
Rx+	RS485 4-wire interface: positive receive line
Rx-	RS485 4-wire interface: negative receive line

Sample for I/O assignment

Inputs IN0 - IN7		Outputs OUT0 - OUT7	
Terminal	Assignment	Terminal	Assignment
IN0		OUT0	
IN1		OUT1	
IN2		OUT2	
IN3		OUT3	
IN4		OUT4	
IN5		OUT5	
IN6		OUT6	
IN7		OUT7	
IN-	Common potential (0V) for IN0 - IN7	OUT-	Common potential (0V) for OUT0 - OUT7

5 Dimensions



Dimensions indicated apply to both units, REL485 relay module and TRIO485 transistor module.

DAM

Digital Analog Module
with 15-bit resolution

ST.1100.0018

13th March, 2017

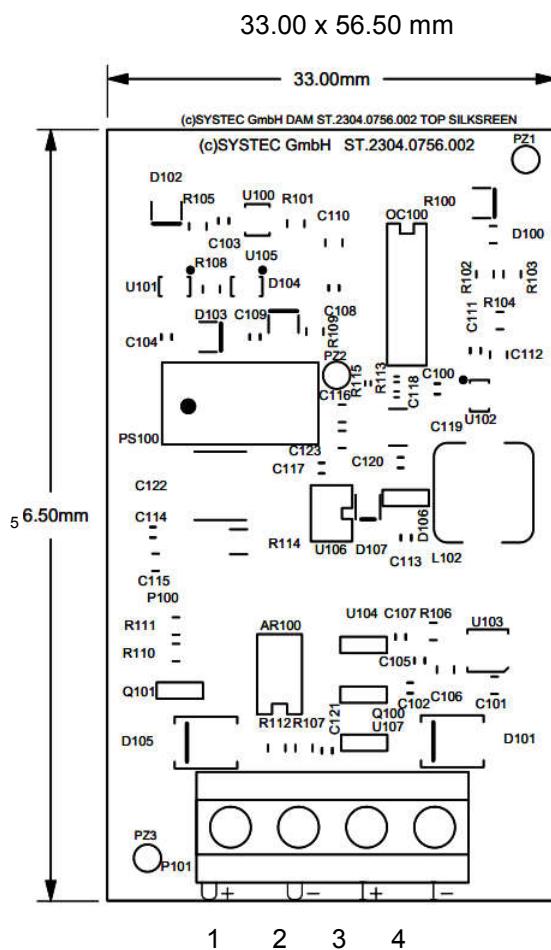
Rev. 1.1

1 Module Description

1.1 General

The DAM is an analog module with voltage and current output. It must be installed on the ADM2 socket. The DAC output has a 15-bit resolution which is driven directly by the operating system / scale task within the high speed real time bus.

1.2 Dimensions



1.3 Terminal Connector

P101	Signal
1 (U+)	(+) 0-10VDC / 2-10VDC
2 (U-)	(-) 0-10VDC / 2-10VDC
3 (I+)	(+) 0-20mA / 4-20mA
4 (I-)	(-) 0-20mA / 4-20mA

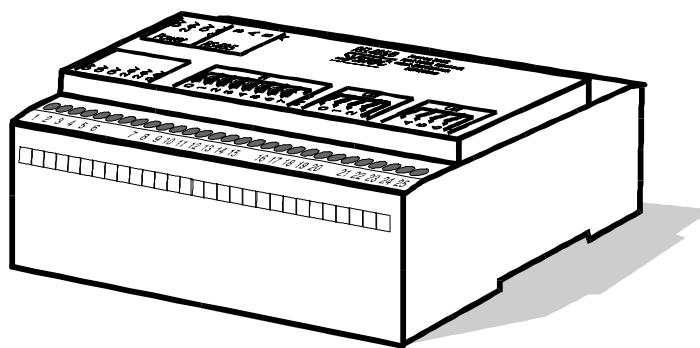
Note: Both analog outputs are active

2 Electrical Specifications

Power Consumption	max. 0.6W (120mA @ 5V)
Analog Resolution	15-bit
Outputs	Active
	0-10VDC / 2-10VDC
	0-20mA / 4-20mA
Potential Isolation	Optically
Tolerance	Adjustable
Voltage Output Load	min. 500 Ohm , <u>NOT</u> short-circuit proof
Current Output Load	max. 500 Ohm
Temperature Stability	<0,002% / K

Installation Instructions

MAI



Analog I/O Module

April 2016

ST.2309.0188

Rev. 5

Installation Instructions Analog I/O Module MAI

Date: April 21, 2016

File: MAI_IAE.DOC

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1 General

The modular analog interface (MAI) provides interfacing for up to 4 analog inputs and/or outputs as option for ITx000 weighing terminals. As of MAI module index 004, also the interface separation module TS3000 can be connected. The basic module has four slots that can be fitted as required (also mixed) with input (ADE) and/or output (DAE) interface boards. The module is controlled from the weighing terminal via a 2-wire RS485 interface. Connection to the separation module TS3000 is made via a 4-wire RS485 interface.

The input and output voltages of the individual modules are isolated from each other and from the voltages of the weighing terminal. The I/Os can be configured for 0 – 10V or 0/4 – 20mA. The required power supply for the I/Os must be provided externally.

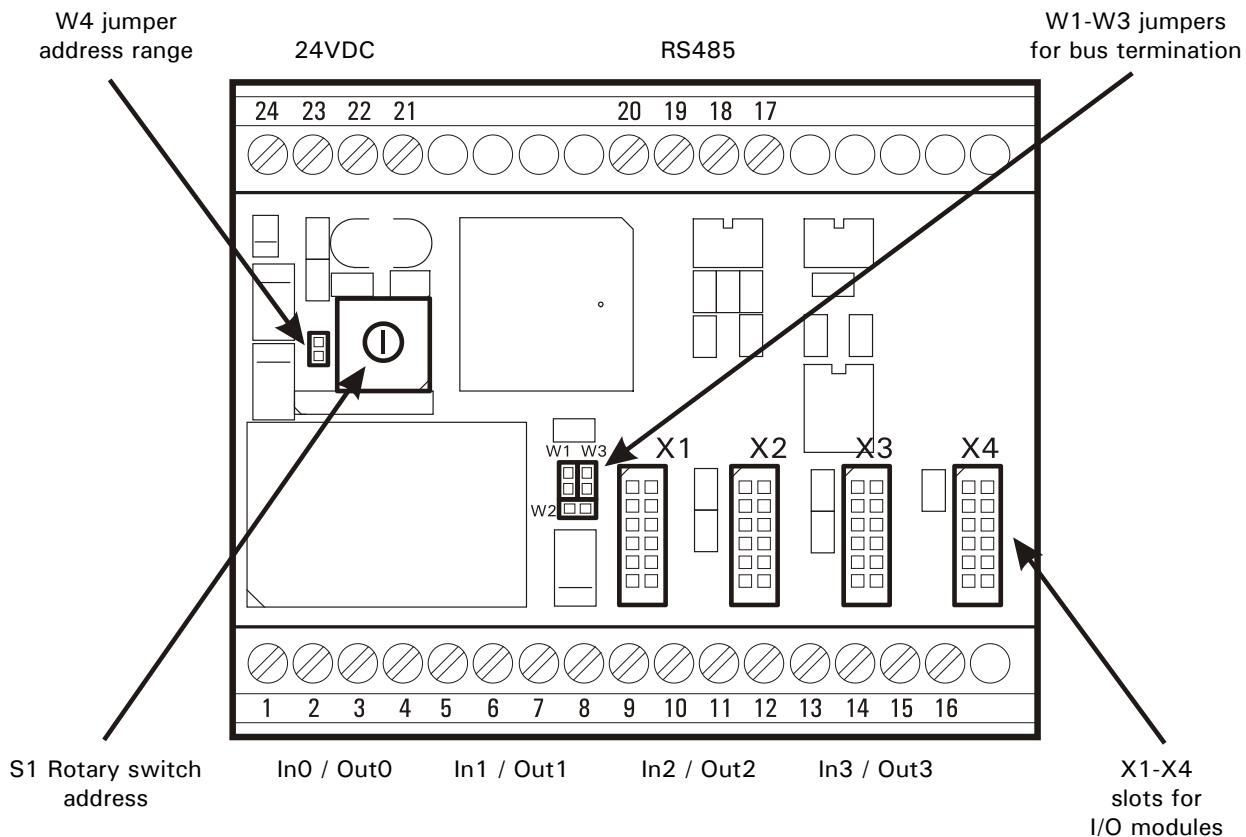
The analog interface can be used on the same RS485 bus as relay or transistor modules for digital signals (firmware 2.0 or higher). The address can be set via a rotary switch, the extension of the address range is possible by means of a jumper. If the analog interface is the last device at the physical end of the bus, the bus lines must be terminated via jumpers.

The MAI module is incorporated in a standard plastic housing for installation on DIN rail.

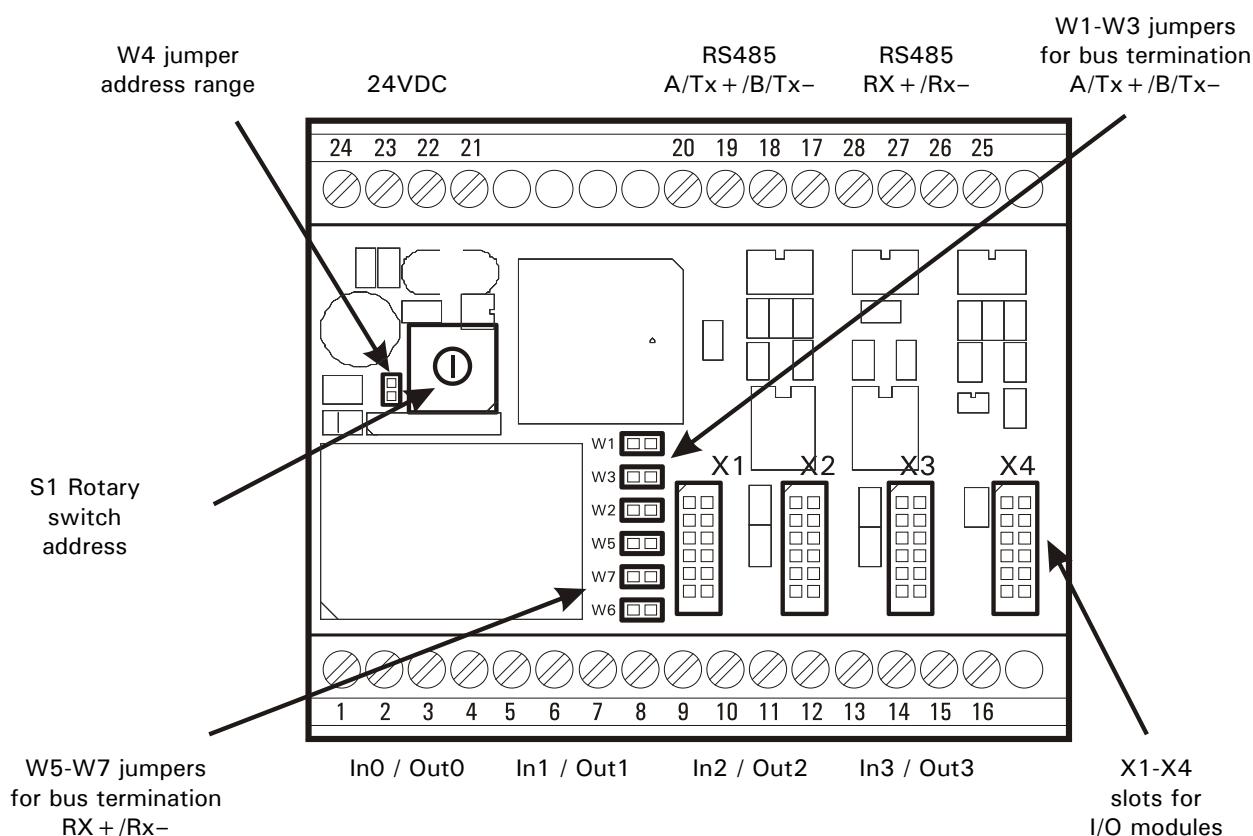
! ATTENTION

- The MAI module must not be installed in hazardous area, it may only be installed in safe area. When it is connected to the separation module TS3000, it must be made absolutely sure that the Technical Manual TS3000 is observed!**

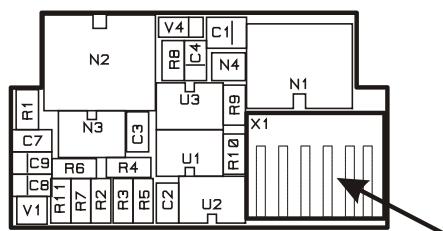
MAI Basic Module index 003 or lower (RS485 2-wire interface only)



MAI Basic Module index 004 or higher (RS485 2-wire and 4-wire interface)

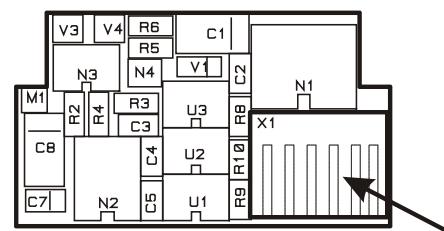


Analog input board (ADE)



X1 connector to basic module

Analog output board (DAE)



X1 connector to basic module

2 Terminal Assignment

Terminal	Assignment	Function	Internally
1	(+) 0-20mA	Input or output 0	KL3
2	(-) 0-20mA	Input or output 0	
3	(+) 0-10V	Input or output 0	
4	(-) 0-10V	Input or output 0	
5	(+) 0-20mA	Input or output 1	KL4
6	(-) 0-20mA	Input or output 1	
7	(+) 0-10V	Input or output 1	
8	(-) 0-10V	Input or output 1	
9	(+) 0-20mA	Input or output 2	KL5
10	(-) 0-20mA	Input or output 2	
11	(+) 0-10V	Input or output 2	
12	(-) 0-10V	Input or output 2	
13	(+) 0-20mA	Input or output 3	KL6
14	(-) 0-20mA	Input or output 3	
15	(+) 0-10V	Input or output 3	
16	(-) 0-10V	Input or output 3	
17	A/Tx +	RS485 2-wire: send/receive signal A RS485 4-wire: send signal Tx +	KL2
18	B/Tx –	RS485 2-wire: send/receive signal B RS485 4-wire: send signal Tx –	
19	A/Tx +	RS485 2-wire: send/receive signal A RS485 4-wire: send signal Tx +	
20	B/Tx –	RS485 2-wire: send/receive signal B RS485 4-wire: send signal Tx –	
21	0V	Power supply 24V	KL1
22	0V	Power supply 24V	
23	+ 24VDC	Power supply 24V	
24	+ 24VDC	Power supply 24V	
25	Rx +	RS485 4-wire: receive signal Rx +	KL7
26	Rx –	RS485 4-wire: receive signal Rx –	
27	Rx +	RS485 4-wire: receive signal Rx +	
28	Rx –	RS485 4-wire: receive signal Rx –	

3 Settings

3.1 Bus Termination Serial Interface RS485

3.1.1 Termination Of RS485 Signals A/Tx + And B/Tx-

Jumper	State	Function
W1	open closed	Pullup resistor 100KΩ Pullup resistor 390Ω
W2	open closed	Pullup resistor 100KΩ Pullup resistor 390Ω
W3	open closed	Bus termination open Bus termination resistor 220Ω

The bus is terminated when the jumpers W1 – W3 are closed.

3.1.2 Termination Of RS485 Signals Rx + And Rx-

Jumper	State	Function
W5	open closed	Pullup resistor 100KΩ Pullup resistor 390Ω
W6	open closed	Pullup resistor 100KΩ Pullup resistor 390Ω
W7	open closed	Bus termination open Bus termination resistor 220Ω

The bus is terminated when the jumpers W5 - W7 are closed.

3.2 Address Setting (S1 Rotary Switch), (W4 Jumper Address Range)

Jumper W4	Switch S1 Position	Address
open 	0	0
	1	1
	2	2
	3	3
	4	4
	5	5
	6	6
	7	7
	8	8
	9	9
closed 	0	16
	1	17
	2	18
	3	19
	4	20
	5	21
	6	22
	7	23
	8	24
	9	25

3.3 Interface Setting Weighing Terminal ITx000

The parameters of the weighing terminal's serial channel that connects to the MAI module must be set to:

Baudrate: 19200

Data Format: 8O (8 bit, odd parity)

Handshake: HDX

Protocol: Ext.Bus

I/O-Modules: enter only number of *parallel* I/O modules on the bus

SinecL2 / DeviceBus: DeviceBus

Note: Connection of MAI analog interface modules requires version RTP 4.09 or later of the operating system.

4 Wiring Examples

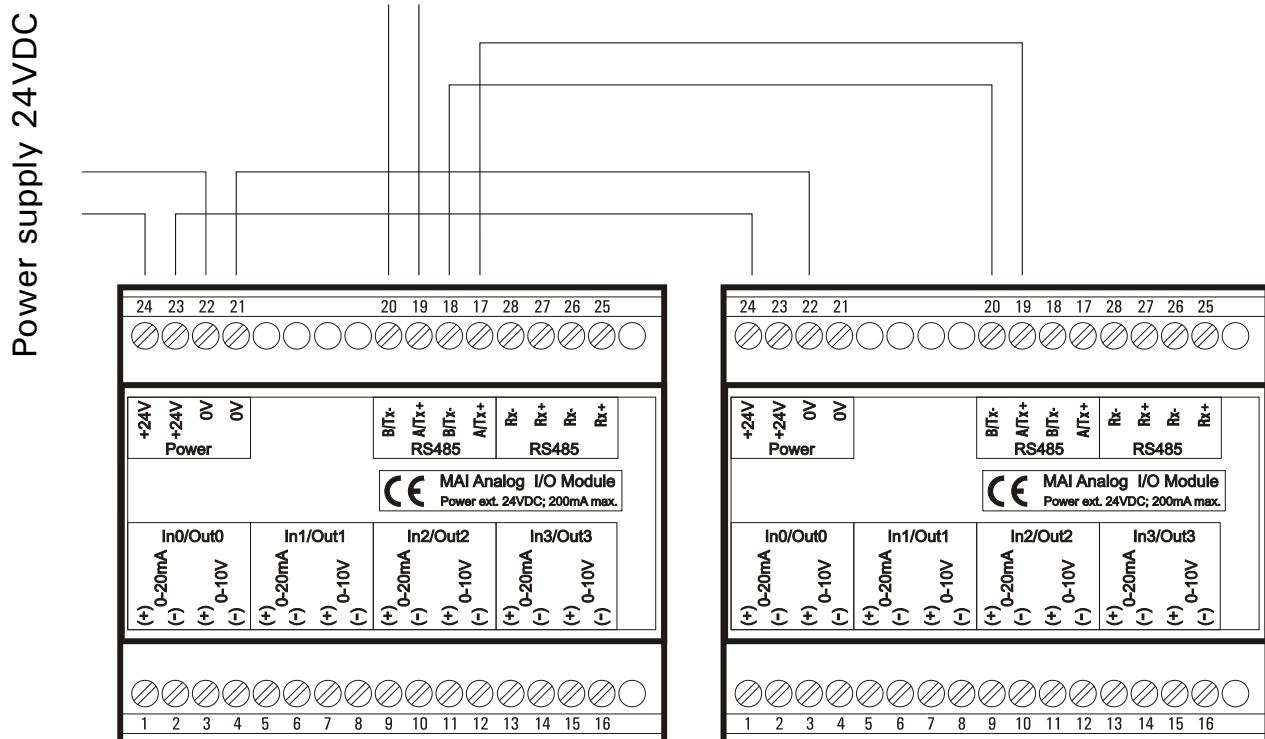
4.1 2-Wire Connection To Weighing Terminal ITx000

Example: RS485 2-wire connection of 2 MAI modules to weighing terminal IT9000.

Note! It is important that the jumpers for pull-up, pull-down and termination resistors are closed at the last module at the physical end of the bus, and that they are open at all other modules.

Cable lengths exceeding 10m also require the installation of a 150Ω termination resistor between A and B line of the RS485 interface in parallel to the wires at the screw terminals of the weighing terminal.

IT9000 SIM RS485 2-wire



Jumpers for termination resistors

open

closed

4.2 4-Wire Connection To Separation Module TS3000

Example: RS485 4-wire connection of 2 MAI modules to separation module TS3000, requires a TS3000 separation module with RS485.4 interface. All components must only be installed in non-hazardous (safe) area.

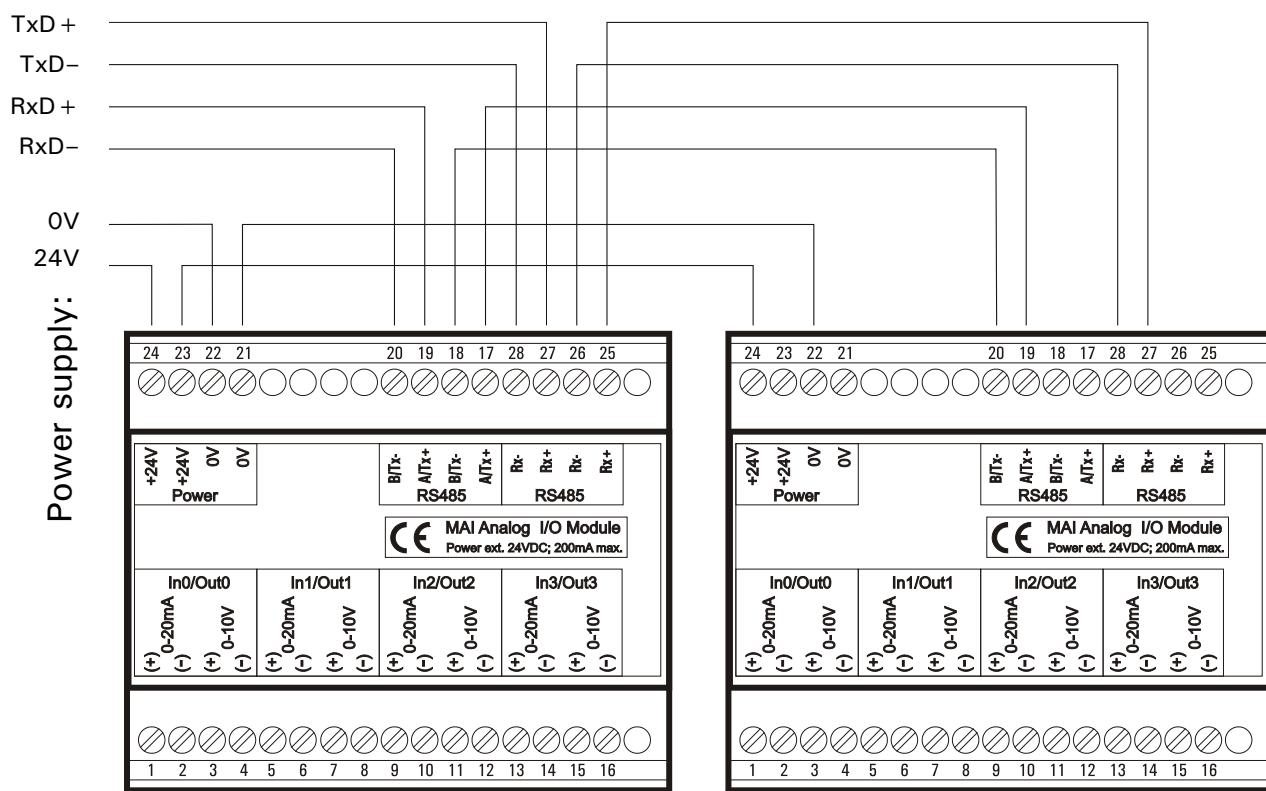
Note! It is important that the jumpers for pull-up, pull-down and termination resistors are closed at the last module at the physical end of the bus, and that they are open at all other modules.

Cable lengths exceeding 10m also require the installation of two 150Ω termination resistors between Tx+ and Tx-, and between Rx+ and Rx- in parallel to the wires at the screw terminals of the separation module.

ATTENTION

- The MAI module must not be installed in hazardous area, it may only be installed in safe area. When it is connected to the separation module TS3000, it must be made absolutely sure that the Technical Manual TS3000 is observed!

Separation
module
TS3000:



Jumpers for termination resistors

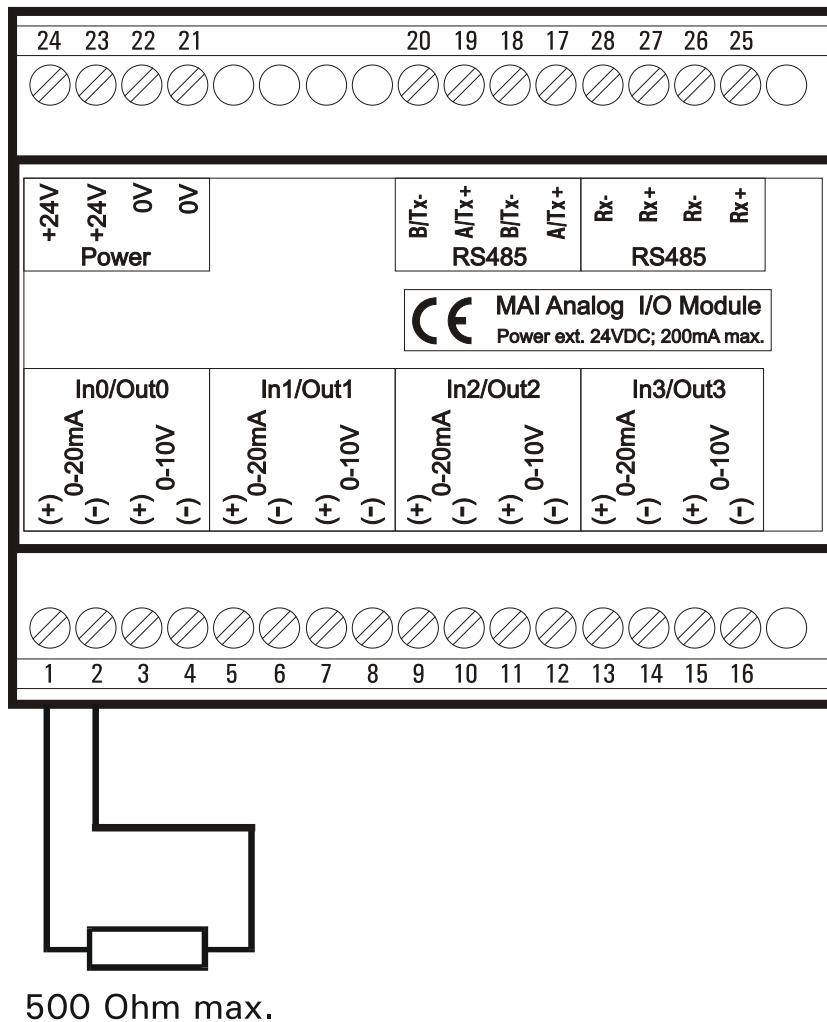
open

closed

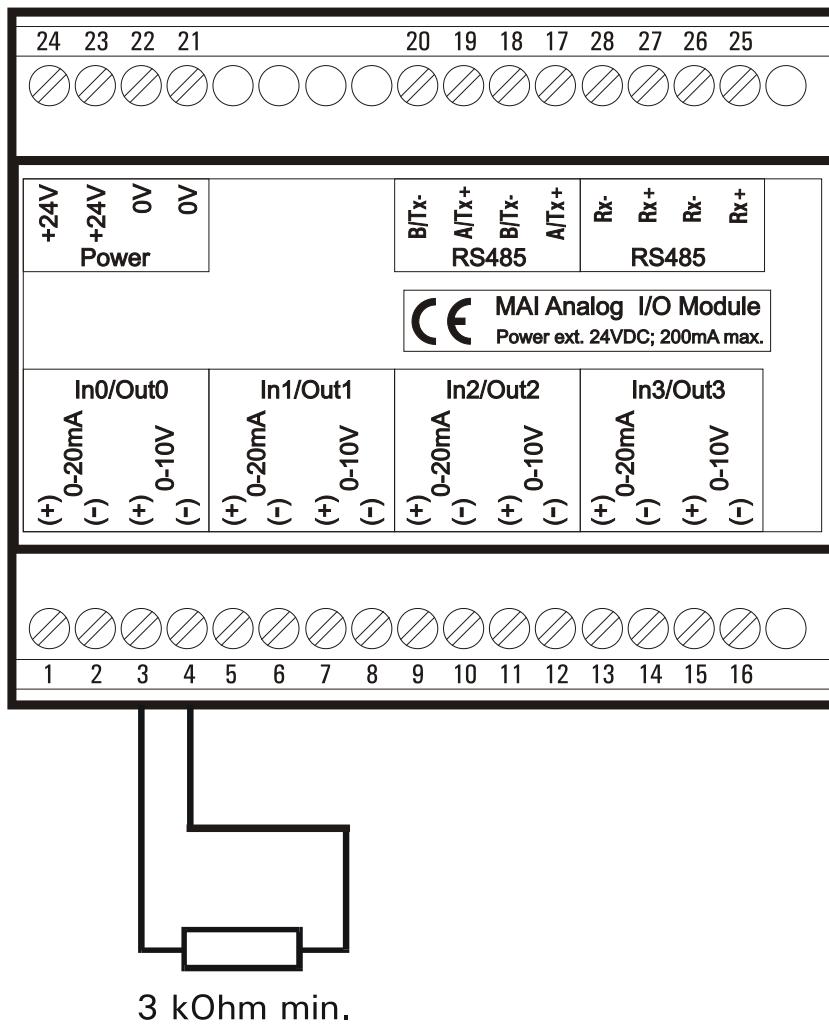
4.3 Connection to Analog Output Board (DAE)

For the output of gross or net weight as analog signal up to 4 Analog Output Boards DAE can be inserted in MAI slots X1 – X4 . The output signals are active and floating and have a resolution of 12 bits (4096 steps). Each DAE provides voltage output 0/2 - 10V (load > 3kOhm) or current output 0/4 - 20mA (load < 500 Ohm).

Connection example of DAE current output 0/4 - 20mA
(DAE inserted in MAI slot X1):



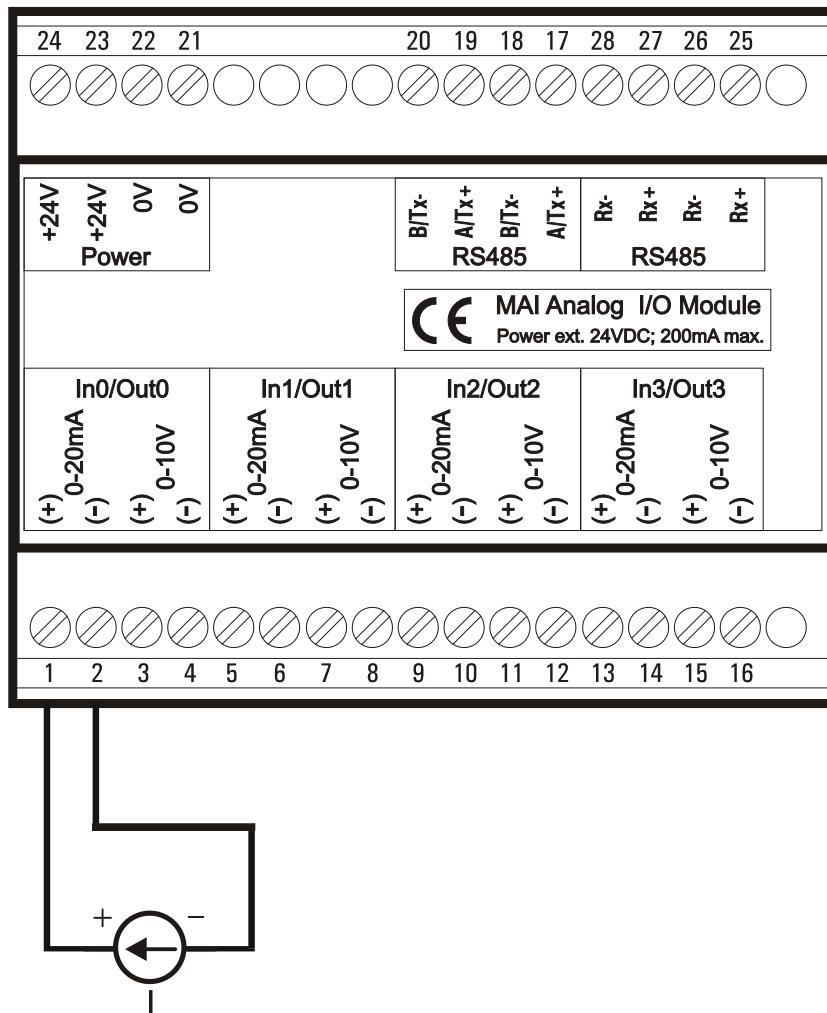
Connection example of DAE voltage output 0/2 – 10V
 (DAE inserted in MAI slot X1):



4.4 Connection to Analog Input Board (ADE)

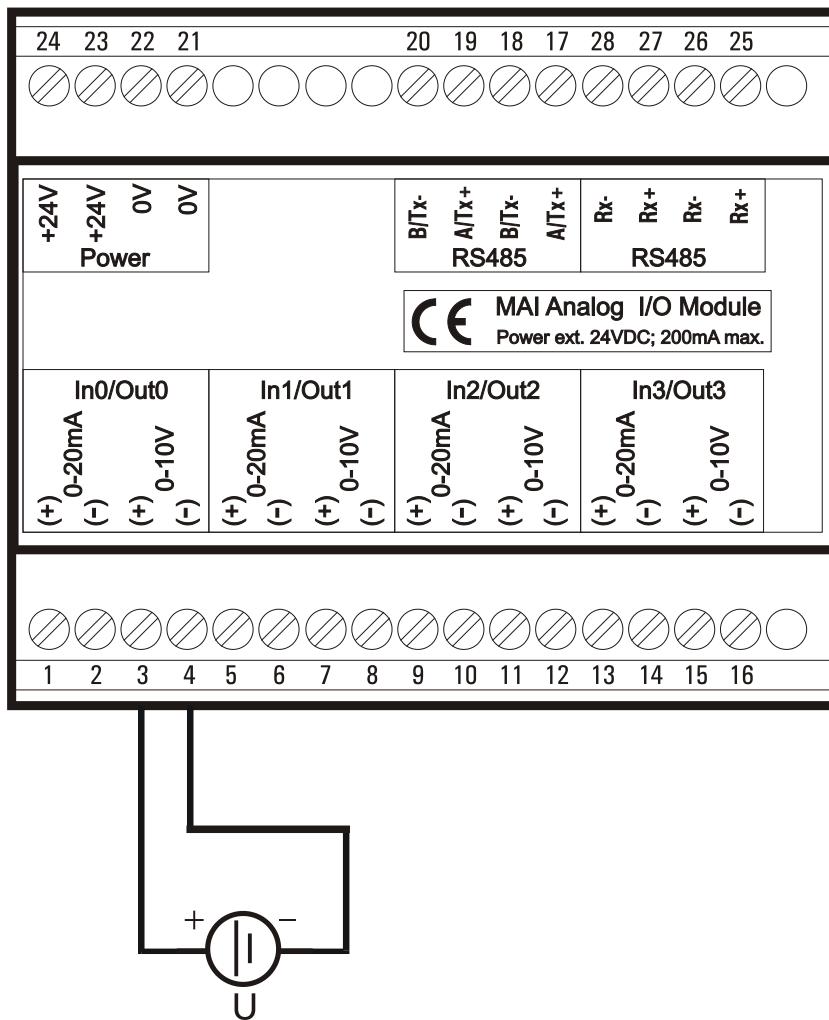
For the measurement of analog voltages or currents the Analog Input Board ADE can be inserted in MAI slots X1-X4. The input signal has a resolution of 12 bit (4096 steps). The input of the ADE board is passive and floating. It provides current input 0/4-20mA (impedance 24 Ohm) or voltage input 0-10V (impedance 105kOhm).

Connection example of ADE current input 0/4 - 20mA
(ADE inserted in MAI slot X1):



ADE input impedance $R_i = 24 \text{ Ohm}$

Connection example of ADE voltage input 0 – 10V
(ADE inserted in MAI slot X1):



ADE input impedance $R_i = 105 \text{ k}\Omega$

4.5 Electrical Characteristics

Supply voltage:	
Nominal value:	24VDC
Permissible range:	19.5...30VDC
Current consumption:	depending on number of I/Os, 200mA max.
Analog inputs:	
Number:	4 max.
Potential separation:	yes, optoisolated inputs
Eingang:	0 - 10 V or 0/4 - 20 mA
Resolution:	12 Bit
Limits of operating error:	± 0.6%
Impedance (U):	105 kΩ
Impedance (I):	24 Ω
Analog outputs:	
Number:	4 max.
Potential separation:	yes, optoisolated outputs
Output:	0 - 10 V or 0/4 - 20 mA
Resolution:	12 Bit
Limits of operating error:	+ / - 0.6%
Load voltage output:	> 3 kΩ
Load current output:	< 500 Ω
Serial interface:	
Hardware:	RS485 2-wire bus
	RS485 4-wire, multidrop as of index 004
Baud rate:	19200 baud (Modbus protocol)
Bus termination:	jumper W1-3 and W5-7
Microcontroller 87C51:	
EPROM:	4 KByte
RAM:	128 Byte
Frequency:	11,0592 MHz
Addressing:	
Rotary switch:	S1
Range select jumper:	W4
Address range:	0 - 9, 16 - 25
Dimensions PCB:	88.0 x 71.8 mm

5 Declaration Of Conformity EU (only valid until April 19, 2016)

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



Konformitätserklärung *Declaration of conformity* *Déclaration de conformité*

Das Relais- / Transistormodul

The relay / transistor module

Le couplage de relais / transisteurs

Hersteller: <i>Manufacturer:</i> Fabricant:	SysTec GmbH
Typ/Modell: <i>Type/Model:</i> Type/modèle:	MAI

entspricht den Anforderungen der folgenden Richtlinien:

corresponds to the requirements of the following EC directives:

correspond aux exigences des directives CE suivantes:

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

entsprechend den folgenden Normen/Empfehlungen:

in conformity with the following standards:

conforme aux normes suivantes:

EN 61000-6-4:2007 EN 60950-1:2006	EN 61000-6-2:2005
--------------------------------------	-------------------

Unterschrift

Signature

Signature

Datum:

24.02.2011

Date:

February 24, 2011

Date:

24.02.2011

Dipl.-Ing. Rainer Junglas

Geschäftsführer / General Manager / Directeur

6 Dimensions

Standard plastic housing for installation on DIN rail

