Operating instructions

METTLER TOLEDO MultiRange
IND690-Base weighing terminals

METTLER TOLEDO
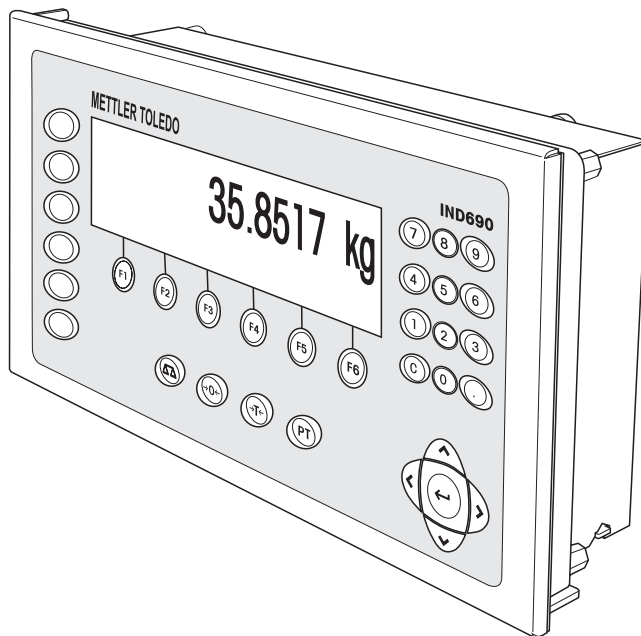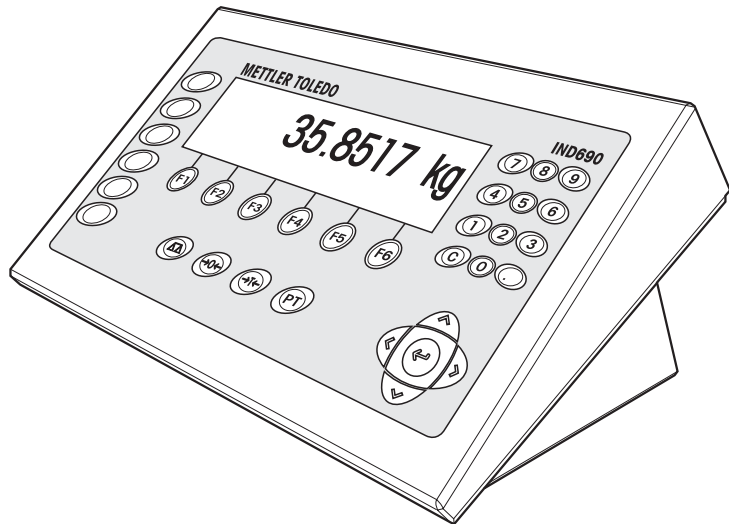
ServiceXXL

Tailored Services

Congratulations on choosing the quality and precision of METTLER TOLEDO. Proper use according to these instructions and regular calibration and maintenance by our factory-trained service team ensure dependable and accurate operation, protecting your investment. Contact us about a ServiceXXL agreement tailored to your needs and budget.

We invite you to register your product at www.mt.com/productregistration so we can contact you about enhancements, updates and important notifications concerning your METTLER TOLEDO product.

Contents

1   Safety instructions

1.1   Safety instructions for IND690xx

The explosion-protected IND690xx weighing terminal fulfills Device category 3 and is approved for operation in Zone 2 (gases) and Zone 22 (dusts) hazardous areas.
There is an increased risk of injury and damage when the IND690xx weighing terminal is used in a potentially explosive atmosphere.
Special care must be taken when working in such hazardous areas. The code of practice is oriented to the "Safe Distribution" concept drawn up by METTLER TOLEDO.

Competence   ▲ The IND690xx weighing terminal, accompanying weighing platforms and accessories may only be installed, maintained and repaired by authorised METTLER TOLEDO service personnel.

▲ The mains connection may only be connected or disconnected by the owner's electrician.

Ex approval   ▲ For the exact specification please refer to the statement of conformity.

▲ In order to avoid electrostatic charging the IND690xx may only be installed in rooms or areas at which strong electric field strengths cannot occur from experience.

▲ No modifications may be made to the terminal and no repair work may be performed on the modules. Any weighing platform or system modules that are used must comply with the specifications contained in the installation instructions. Non-compliant equipment jeopardizes the safety of the system, cancels the Ex approval and renders any warranty or product liability claims null and void.

▲ The cable glands must be tightened so that a strain relief of ≥ 20 N per mm cable diameter is ensured.

▲ When connecting external devices, always observe the maximum permissible connected loads, see installation information. It must be ensured that no voltages are fed into the IND690xx than it itself provides. The interface parameters have to fulfill the standard.

▲ Peripheral devices without an Ex approval may only be operating in non-hazardous areas. It must be ensured that no voltages are fed into the IND690xx than it itself provides. In addition the maximum permissible connected loads have to be observed, see Page installallation information. The interface parameters have to fulfill the standard.

▲ The safety of a weighing system including the IND690xx weighing terminal is only guaranteed when the weighing system is operated, installed and maintained in accordance with the respective instructions.

▲ Also comply with the following:
   – the instructions for the system modules
   – the regulations and standards in the respective country
   – the statutory requirement for electrical equipment installed in hazardous areas in the respective country, e.g. EN 60079-14 and EN 6124-14
   – all instructions related to safety issued by the owner

▲ Before initial start-up and following service work, check the explosion-protected weighing system for the proper condition of all safety-related parts.

Operation ▲ Prevent the build-up of static electricity. Therefore:
   – only operate the IND690xx in rooms or areas at which strong electric field strengths cannot occur from experience,
   – always wear suitable working clothes when operating or performing service work on the system,
   – do not rub or wipe off the keyboard surface with a dry cloth or glove.

▲ Do not use protective hoods.

▲ Prevent damage to the weighing terminal. Hairline cracks in the keyboard membrane are also considered damage.

▲ If the IND690xx weighing terminal, accompanying weighing platforms or accessories are damaged:
   – Switch off weighing terminal.
   – Separate the weighing terminal from the mains in accordance with the applicable regulations.
   – Secure the weighing terminal against accidental start-up.

Leakages ▲ The IND690xx panel unit does not comply with any freedom-from-leaks rating. Therefore the installer is responsible for compliance with the freedom from leaks rating, e.g. at control cabinet installation. The respective national standards furthermore have to be observed. At least a freedom-from-leaks rating IP54 is required in hazardous areas, in case of conductive dust IP6X.

1.2   Safety instructions for IND690-24V

▲ Never operate the IND690-24V weighing terminal in hazardous areas; there are special scales in our product line for this purpose.

▲ The IND690-24V weighing terminal may only be connected to a power supply (storage battery or mains) having a 24 VDC SELV power circuit in accordance with EN 60950.

▲ Short-circuit danger!
Ensure that the power supply is connected properly:
brown lead   +24 V
blue lead   0 V or negative pole

▲ The safety of the unit is endangered if it is not operated in accordance with these operating instructions.

▲ Only authorized personnel may open the IND690-24V weighing terminal.

Competence   ▲ The IND690-24V weighing terminal, accompanying weighing platforms and accessories may only be installed, maintained and repaired by authorised METTLER TOLEDO service personnel.

Leakages   ▲ The IND690-24V panel unit does not comply with any freedom-from-leaks rating. Therefore the installer is responsible for compliance with the freedom from leaks rating, e.g. at control cabinet installation. The respective national standards furthermore have to be observed.

1.3   Safety instructions for IND690

▲ Do not operate the IND690 weighing terminal in hazardous areas. We have special suitable scales in our range of products for hazardous areas.

▲ Ensure that the power socket outlet for the IND690 weighing terminal is earthed and easily accessible, so that it can be de-energised rapidly in emergencies.

▲ Ensure that the supply voltage at the installation site lies within in the range of 100 V to 240 V.

▲ The safety of the device cannot be ensured if it is not operated in accordance with these operating instructions.

▲ Only authorised personnel may open the IND690 weighing terminal.

Competence   ▲ The IND690 weighing terminal, accompanying weighing platforms and accessories may only be installed, maintained and repaired by authorised METTLER TOLEDO service personnel.

Leakages   ▲ The IND690 panel unit does not comply with any freedom-from-leaks rating. Therefore the installer is responsible for compliance with the freedom from leaks rating, e.g. at control cabinet installation. The respective national standards furthermore have to be observed.

2   Introduction and commissioning

2.1   Documentation

The weighing terminal comes supplied with a CD containing all the documentation on the IND690 weighing system.

These installation instructions describe operation of the IND690 with the basic software Base-690 and all possible interfaces.

If your weighing terminal is equipped with application software (Batch-690, Com-690, Control-690, Count-690, Fill-690, Form-690, FormXP-690, Sum-690) you'll find the application specific information in the corresponding operating instructions.

2.2   Applications

With the weighing terminals the following applications are possible:

IND690
IND690-24V

IND690xx

Hazardous area Zone 2 / Zone 22   Safe area

Zone 2 / Zone 22
Approved peripherals
e.g. barcode reader

Zone 2 / Zone 22
Approved weighing
platforms
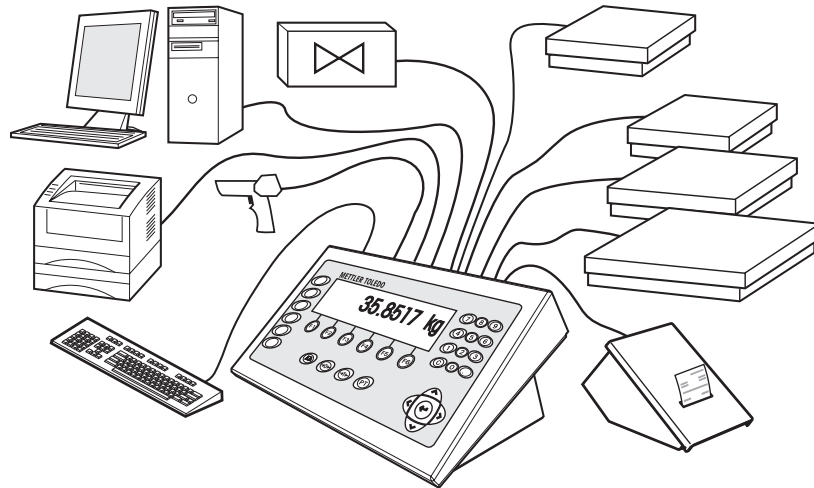
- Multi-scale operation with up to 4 weighing platforms with IND690 resp. up to 3 weighing platforms with IND690xx and IND690-24V, including weighing platforms with an analog signal output.

- Up to 9 data interfaces
    - for printing,
    - for data exchange with a computer,
    - for connecting a barcode reader,
    - for control, e.g. of valves or flaps,
    - for connecting reference scales,
    - for connecting an external keypad.

2.3 IND690 weighing terminals

2.3.1 Display
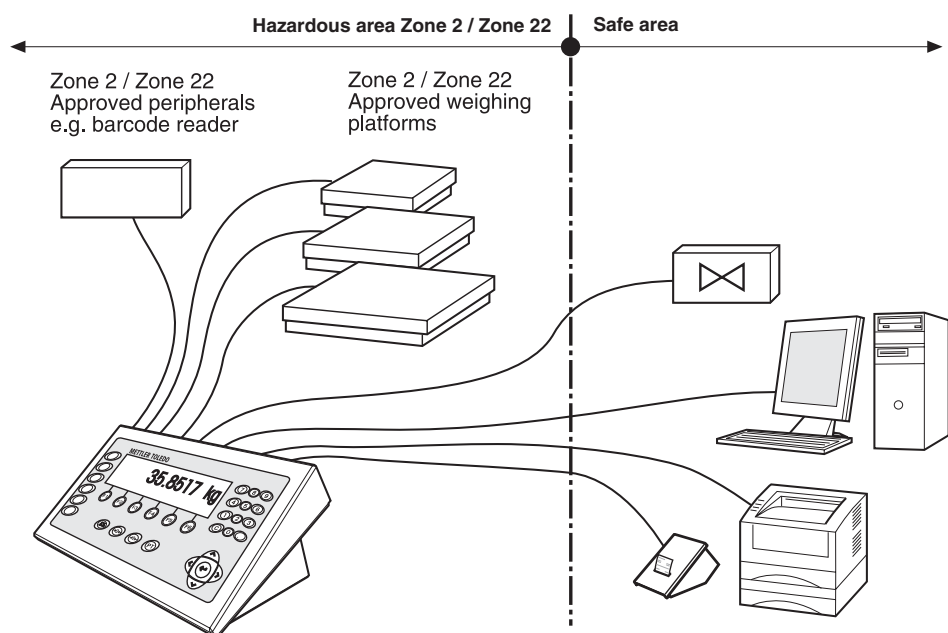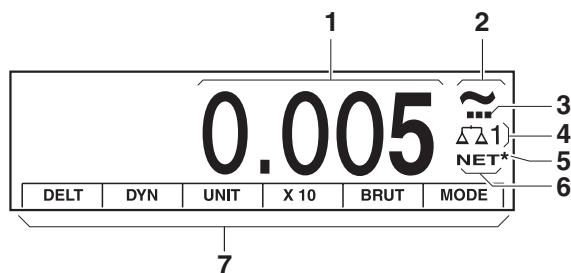

1 Weight display BIG WEIGHT® with sign and decimal point

2 Stability monitor: lights up until the weighing platform has levelled out, then the weight unit appears here

3 Range display for multi-range weighing platforms

4 Number of the weighing platform: shows the weighting platform just selected

5 Symbol * for identifying weight values in the second unit or in a higher resolution

6 NET symbol for marking net weight values

7 Assignment of the function keys

2.3.2 Keypad
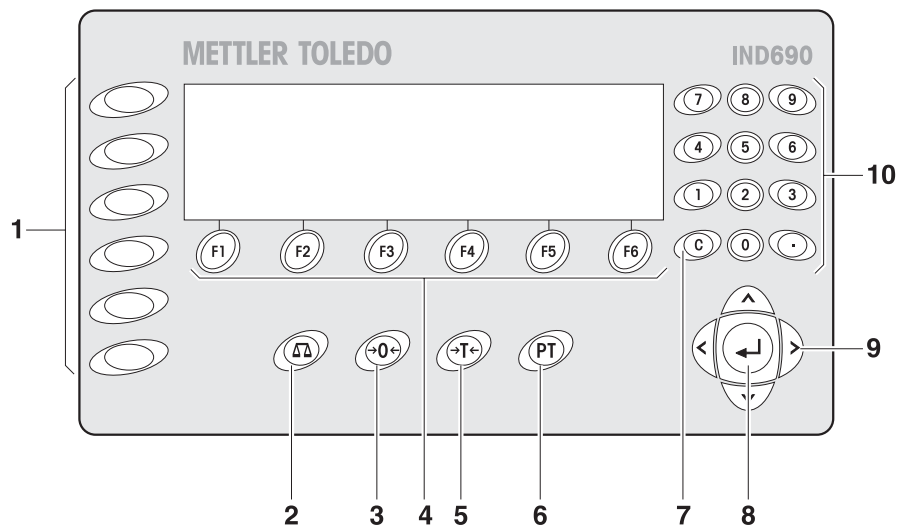
1 CODE A … CODE F keys – enter identification data

2 SCALE key – select scale

3 ZERO-SET key – set scale to zero, test scale

4 Function keys F1 … F6 – the current assignment is shown in the display above the key

5 TARA key – tare scale

6 TARE SPECIFICATION key – enter known tare values numerically

7 CLEAR key – clear entries and values

8 ENTER key – accept and transfer data

9 Cursor keys

10 Numeric keypad with decimal point

2.4 Cleaning

DANGER OF SHOCK

➜ Do not open the weighing terminal to clean.

CAUTION

➜ Make sure that unused connection sockets are covered with protective caps to protect the socket contacts from moisture and dirt.

Cleaning

➜ Wipe off the weighing terminal with a commercially available glass or plastic cleaner.

3   Basic functions

3.1   Switching on and off

Switch on from the standby mode

→ Press any key.
The display shows a weight value based on the last tare value and zero point.

Note
We recommend leaving the device switched on when it is operated in humid areas or is subjected to high temperature fluctuations. This ensures that condensate does not form on the device inside.

Switch off

→ Press function key OFF.
The display goes out and the IND690 weighing terminal is in the standby mode. The zero point and tare value remain saved.

Note
If the function key OFF does not appear in the current assignment, press the cursor key < or > several times if necessary until OFF is displayed.

Switch on with restart

1. Relieve weighing platform.

2. Press function key OFF and hold down until METTLER TOLEDO IND690 (factory setting) or text you have specified appears in display.
Then weight value appears.

The weighing platform is restarted.

Note
The text which appears during switch-on with a restart is saved in the text memory 20, see page 37.

3.2   Charge indicator in storage battery operation (IND690-24V only)

If the supply voltage drops below 22.5 V, a continuous whistle sound is emitted for approx. 10 to 30 minutes.
If the supply voltage drops below 21 V, the IND690-24V weighing terminal switches off automatically.

→ If the whistle sound is emitted, complete the current weighing process and charge or replace the storage battery.

3.3   Setting to zero

Setting to zero corrects the influence of minor dirt on the load plate.
In the case of excessive dirt which cannot be compensated by setting to zero, the display shows OUT OF RANGE.

Manual zero set   1. Relieve weighing platform.

2. Press $\widehat{\rightarrow 0 \leftarrow}$.
    The display shows 0.000 kg.

Automatic zero set   On certified weighing platforms the zero point of the weighing platform is automatically corrected when the weighing platform is relieved.
The automatic zero set can be switched off in the master mode on noncertified weighing platforms.

3.4   Taring

3.4.1   Manual taring

1. Place empty container on scale.

2. Press $\widehat{\rightarrow T \leftarrow}$.
    The tare weight is saved and the weight display set to zero.
    The display shows the NET symbol.

Notes

- When the weighing platform is relieved, the saved tare weight is displayed with a negative sign.
- The weighing platform only saves **one** tare value.

3.4.2   Automatic taring

Condition
AUTOTARA ON must be set in the master mode, see page 48.

➔ Place empty container on scale.
   The container weight is automatically saved and the weight display set to zero.
   The display shows the NET symbol.

Note
The saved tare weight is automatically deleted with the load is removed from the weighing platform.

3.4.3   Specify tare weight

Enter numerically
1. Press (PT).

2. Enter tare weight (container weight) and confirm with ↵.
   When weighing platform is relieved, the entered tare weight is displayed with a negative sign.

Note
The weight unit for entering the tare weight can be selected with the cursor keys < or >.

Correct entry
→ Clear the entry character by character with (c) and repeat correctly.

Copy tare constant
The IND690 has 999 tare memories for frequently used tare weights programmed in the master mode.

1. Enter memory number: 1… 999.

2. Press (PT).
   The memory number, the saved tare weight and the designation appear briefly in the display. The next to appear is the weight display with the net weight referred to the called-up tare weight and the symbol NET.

3.4.4   Recall currently saved tare weight
The saved tare weight can be recalled at any time.

→ Enter INFO, (PT) sequence.
   The saved tare weight is displayed.

3.4.5   Clear tare weight

→ Relieve weighing platform and tare.

– or –

→ Specify tare weight 0.

– or –

→ Enter (PT), (c) sequence.

Note
If AUTO CLEAR TARE ON is selected in the master mode, the saved tare weight is automatically deleted with the load is removed from the weighing platform.

3.5   **Weighing**

Weighing without taring   ➜ Lay weighing sample on weighing platform.
Gross weight (total weight) is displayed.

Weighing with taring   1. Place the empty container on the weighing platform and tare.

2. Pour in weighing sample.
The display shows the net weight and the NET symbol.

Weighing with tare specification   1. Place filled container on weighing platform.
The display shows the gross weight (total weight).

2. Specify tare weight or recall tare memory.
The display shows the net weight (container content) and the NET symbol.

Note
If the MinWeight function is activated in the master mode, weight values that fall below the defined minimum weight are identified with the blinking symbol ⧄ .

3.6   **Working with several weighing platforms**

Up to 4 weighing platforms can be connected to the IND690, and up to 3 weighing platforms can be connected to the IND690xx and IND690-24V.
Depending on the setting in master mode, only the currently active scale appears in the display (serial Multi-scale mode) or all scales are operated at the same time (parallel multi-scale mode). A constantly updated sum scale is also available in parallel multi-scale mode.

3.6.1   **Switch over weighing platform**
The weighing platform currently selected is shown on the terminal.

➜ Press ⊙ .
The next weighing platform is selected.

– or –

➜ Enter number of weighing platform and press ⊙ .
The desired weighing platform is selected.

3.6.2 Displaying several scales simultaneously

Condition

PARALLEL SCALE is selected in the master mode.

➜ Press the cursor key < or > as often as necessary until all scales are shown in the display.

Notes

- When all scales are displayed, only the function keys UNIT and GROSS are still active. These function keys then act on all connected scales.
- The sum scale can only be operated non-verifiably. It is therefore identified by the symbol Σ.
- The calculation mode and resolution of the sum scale can be configured in master mode, see Section 5.5.5.

4   Additional functions

The assignment of the 6 function keys of the IND690 weighing terminal differs depending on the weighing task. The current assignment is shown above the function keys. The cursor keys < or > can then be used to switch to other function key assignments.

Independent of the application software, the IND690-Base has the following additional functions:

DELT	DYN	UNIT	X 10	GROSS	MODE
Weighing with the DeltaTrac, see 4.1	Dynamic weighing, see 4.2	Change weight unit, see 4.3	Increase resolution, see 4.4. This key is not assigned when the control mode is continually switched on.	Display gross weight, see 4.5	Activate master mode, see Chapter 5

MUL-T	ADD-T	ITARE	SETP	OFF	INFO
Multiplicative tare function, see 4.7	Additive tare function, see 4.8	Sandwich tare, see 4.9	Set dynamic set points, see 4.6. This key is not assigned if no set points are defined.	Switching off terminal	Calling up information

Without additional application software, the IND690-Base still provides the following function keys for totalizing:

PLUS	MAN	CANC	SUM	TARG	ITEM
Totalizing is described in Section 4.10					

4.1   **Weighing with the DeltaTrac**

The DeltaTrac is an analog display which makes it easier to read the weighing results.

In the master mode you can select how the DeltaTrac is displayed for the various weighing tasks FILLING, CLASSIFYING or CHECKWEIGHING.

Notes

• With the DeltaTrac signals you can also control lamps, flaps or valves, see page 65.

• With the AnalogOut-690 interface the net value can be output as an analog current or voltage signal, see page 68.

Application FILLING   For weighing-in to a target weight with tolerance monitoring.
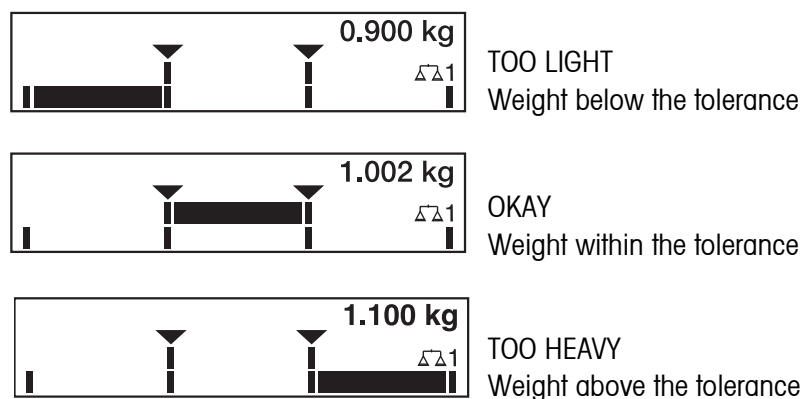
Example: Target weight = 1.000 kg, tolerance = +/–1 %

```
                      � marks      0.560 kg
                                          ⟨⟩1
     ▓▓▓▓▓▓▓▓▓
```
Target weight not reached yet

```
                      ▼                  0.991 kg
                                          ⟨⟩1
     ▓▓▓▓▓▓▓▓▓▓▓▓▓
```
Weight within the tolerance

```
                      ▼                  1.000 kg
                                          ⟨⟩1
     ▓▓▓▓▓▓▓▓▓▓▓▓▓▓
```
Target weight reached exactly

Application CLASSIFYING   To evaluate test samples as OKAY, TOO LIGHT or TOO HEAVY, based on a target weight and specified +/– tolerances.

Example: Target weight = 1.000 kg, tolerance = +/–1 %

```
              ▼         ▼                0.900 kg
                                          ⟨⟩1
     ▌▓▓▓▓▓▓▌   ▌          ▌
```
TOO LIGHT
Weight below the tolerance

```
              ▼         ▼                1.002 kg
                                          ⟨⟩1
     ▌       ▓▓▓▓▓▓   ▌          ▌
```
OKAY
Weight within the tolerance

```
              ▼         ▼                1.100 kg
                                          ⟨⟩1
     ▌       ▌       ▓▓▓▓▓▓▓▓▓▌
```
TOO HEAVY
Weight above the tolerance

Application CHECKWEIGHING   For determining the difference between the target and actual weight.

Example: Target weight = 1.000 kg, tolerance = +/−1 %

```
                         0.900 kg
▼▼▼
DELTA        -0.100 kg         ⏥1
```
Weight below the tolerance
Difference: −0.100 kg

```
                         1.002 kg
             ▼▼▼
DELTA        +0.002 kg         ⏥1
```
Weight within the tolerance
Difference: +0.002 kg

```
                         1.100 kg
                         ▼▼▼
DELTA        +0.100 kg         ⏥1
```
Weight above the tolerance
Difference: +0.100 kg

4.1.1   Preset DeltaTrac target values

Enter numerically

1. Press DELT key.

2. Enter target weight and confirm with ↵.

3. Enter the lower tolerance TOL (−) as a % of the target weight and confirm with ↵.

4. Enter the upper tolerance TOL (+) as a % of the target weight and confirm with ↵.

Notes

• The weight unit for entering the DeltaTrac target values can be selected with the cursor keys < or >.

• The terminal suggests symmetrical tolerances TOL. (+) and TOL. (−). However, different tolerances are also permissible.

Correct entry   ➜ With ⓒ the entry is corrected character by character.

Copy constants   The IND690 weighing terminal has 999 DeltaTrac memories for frequently used target values and tolerances, which are programmed in the master mode.

1. Enter number of DeltaTrac memory: 1 … 999.

2. Press DELT key.

Reference sample

1. Press DELT key.

2. Lay sample on weighing platform and confirm with ⏥.

3. Only for FILLING and CLASSIFYING: Enter tolerance and confirm with ↵.

4. Remove sample from weighing platform.

Limits	Minimum target value	10 Digit, can be adjusted in master mode, see page 38
	Maximum target value	configured maximum load
	Minimum tolerance	1 Digit
	Maximum tolerance	100 %

Note

If the limits are not observed, a message appears in the display, e.g. MIN-DEL = …, for too small a target value.

Clear DeltaTrac target value

➔ Press DELT $\copyright$ key sequence.
DELTA CLEARED appears briefly in the display, then the weight is shown.

4.2 Dynamic weighing

With the dynamic weighing function you can weigh restless weighing samples, e.g. live animals. To do this, specify the number of weighing cycles for which the mean weight value is to be taken.

1. Set container on the weighing platform.

2. Tare weighing platform.

3. Place weighing sample in container.

4. Press DYN key and enter number of weighing cycles.
   Possible values: 1 … 255.

5. Start dynamic weighing with ↵.

6. After cycle time has expired, center line of display shows:
   RESULT x.xxxx kg.
   This display is retained until the next weighing is started or until it is cleared.

Delete result ➔ Press $\copyright$.

Notes

• Dynamic weighing results are automatically printed when AUTO PRINT is set in the master mode, see page 41.

• During dynamic weighing it is not possible to display the weight value BIG WEIGHT DISPLAY, which fills the entire display.

• Dynamic weighing can also be started with the interface command AW016…, see page 116.

4.3 Change weight unit

If an additional, second weight unit is configured in the master mode, it is possible to switch back and forth between the two weight units.

➔ Press UNIT key.
The weight value is shown in the second unit.

Note

Possible second weight units are: mg, g, kg, lb, oz, ozt, dwt.

4.4   Working in a higher resolution

Depending on the setting of the master mode block CONTROL MODE (see page 41), the weight value can be displayed in a higher resolution continuously or when called. Weight values in a higher resolution are marked with a *.

Displaying weight values in higher resolution

➔ Press X 10 key.
    The weight value is displayed in at least a 10x higher resolution.
    The higher resolution is displayed until the X 10 key is pressed again.

Note

With certified weighing platforms, the weight value only appears in a higher resolution as long as the X 10 key is pressed.

4.5   Display gross weight

The gross weight can only be displayed when a tare weight has been saved.

➔ Press GROSS key and hold down.
    The gross weight is displayed.

4.6   Specifying dynamic set points

Conditions

- 4 I/O-690 interface or 8-690 relay box connected.
- SETPOINT MODE ON is selected and a dynamic switching point is allocated to at least one output in the mastermode.

Use   If the specified set point values are exceeded or dropped below, digital outputs are set, e.g. for controlling lamps, flaps, valves etc.
Dynamic set points can be set for each weighing procedure individually.
The set points are retained until they are overwritten with a new value or deleted.

Specifying set points

1. Press the SETP key; the entry prompt for the first dynamic set point appears.
2. Enter the desired weight value and confirm with ↵.
3. If additional dynamic set points are configured, the entry prompt appears for the next dynamic set point.
4. Enter the desired weight value and confirm with ↵.
5. Repeat the procedure until all set points have been entered.

Deleting set points

➔ Press the SETP key and delete the value with the (c) .

4.7   **Multiplicative tare function**
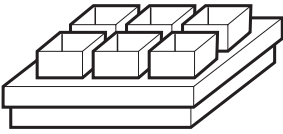
The multiplicative tare function is particularly suitable when pallets with identical containers are filled. If the number of containers and tare of the individual container are known, the weighing terminal calculates the total tare.
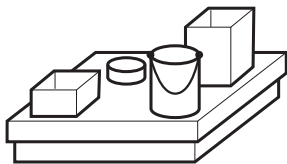
1. Press MUL-T key.

2. Enter known tare weight of individual container and confirm with ↵.

3. Enter number of containers and confirm with ↵.
    When the weighing platform is relieved, the total tare value is shown in the display with a negative sign.

Note
The weight unit for entering the tare weight can be selected with the cursor keys < and >.

4.8   **Additive tare function**

With the additive tare function you can subtract the tare of additional containers with a know tare weight for related weighings, e.g. if containers with different weights are filled on one pallet.

1. Place container on scale and press ADD-T key.

2. Enter known tare weight and confirm with ↵.
    The total net weight appears in the weight display.

Note
The weight unit for entering the tare weight can be selected with the cursor keys < or >.

4.9   **Sandwich tare**
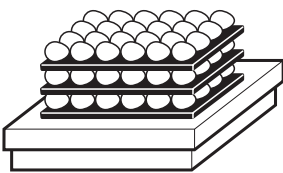
With the sandwich tare function you can detect additional tare weights for related weighings without loosing the total gross and total net.

Example
In production or shipping boxes are laid between individual layers in the transport container. The weight of these boxes can be subtracted with this function.

1. Press ITARE key.

2. Place sandwich tare, e.g. box, on scale and confirm with ↵.
    The net weight is retained.

4.10 Totalizing

Totalizing is only possible at the IND690-Base without additional software.
The following function keys are available for totalizing:

PLUS	MAN	CANC	SUM	TARG	ITEM
Totalize the items	Totalize manual weight values	Remove the last item from the total	Display and print out the total	Enter the target value for the total	Enter a start and end value for the item counter

4.10.1 Course

1. Place an item on the scale.
   If the weight exceeds the minimum deflection specified in mastermode, the "+" sign flashes behind the concurrent total.

NO.: 0001
SUM: 1,000 kg+

1,000 kg

2. Press PLUS key.
   The item is added to the total and transferred to the printer/PC.

3. Totalize further items.
   The item counter (NO.) and the transaction number are both increased by 1.

4.10.2 Printing the total and finalising

1. Press the SUM key.
   The total is displayed and printed out.

2. In order to continue with totalizing, press the ↵ key.

   – or –

➜ To clear the sum, press the (c) key.
   The item counter is reset to the start value.

4.10.3 Manual entry

In order to add known weights to the total proceed as follows:

1. Unload the scale and press the MAN key.

2. Enter the weight and use the ↵ key to add to the total.

4.10.4   Totalizing to a target value

If a target value is entered, the TARGET REACHED message is displayed when this weight value is reached.

1. Press the TARG key.

2. Enter the target weight and confirm with ↵.

3. Totalize the items.

4. When the TARGET REACHED message is displayed, finalize the total.

4.10.5   Totalizing with an item counter

The start and end value of the item counter can be specified between 1 and 9999.

1. Press the ITEM key.

2. Enter the start value and confirm with ↵.

3. Enter the end value and confirm with ↵.

4. Totalize the items.

5. When the TARGET REACHED message is displayed, finalize the total.

4.10.6   Cancelling an item

The last added item can be removed from the total.

➔   Press the CANC key.
    The last item is removed from the total, the item counter is reduced by 1.

4.11   Display ID code and test weighing platform

Each time the weighing platform configuration is changed the ID code counter is increased by 1. On certified weighing platforms the displayed ID code must match the ID code on the ID code sticker, otherwise the calibration is no longer valid.

Display ID code

➔   Press ⟿0⟿ and hold until IDENTCODE = ... appears in the display.

Test weighing platform

➔   Press ⟿0⟿ again.
    The connected weighing platform is checked. The display shows CHECK SCALE and then SCALE IS OK after completing the test.

Note

If weighing platform is defective, display shows SCALE ERROR.

4.12   Identifications

The weighing terminal is equipped with 6 identification data memories for storing identification data Code A … Code F.

The memories have a name, e.g. Article No., and a content which identifies the current weighing, e.g. 1234567.

The memories are named in the master mode, and the names can be noted on the keyboard. When the CODE keys are pressed, the name appears in the display.

Identification data Code A … Code F can be entered or recalled for each weighing and are printed immediately.

4.12.1   Enter identification

An identification may contain a maximum of 30 characters.

Enter numerical identification

1. Press one of the keys CODE A … CODE F.

2. Enter identification data Code A … Code F via the numeric keypad and confirm with ↵.

Enter alphanumeric identification

1. Press one of the keys CODE A … CODE F.
    The functions keys are given the following assignment:

ABCDE	**FGHIJ**	**KLMNO**	**PQRST**	**UVWXY**	**Z/-()**
Selection of letters A to E	Selection of letters F to J	Selection of letters K to O	Selection of letters P to T	Selection of letters U to Y	Selection of letter Z or a special character

2. Select desired group of letters, e.g. press KLMNO key.

3. Select desired letter.
    The display changes again to the above selection.

4. Repeat entry in steps 2 and 3 for additional characters.

Notes

*   Letters and numbers can be combined as desired.

*   It is possible to switch between upper case and lower case with the cursor keys ∧ and ∨ . The following special characters are then also available with the lower case letters: *, $, %, &.

Recall fixed text memory

The IND690 weighing terminal is equipped with 999 memories for fixed texts which can be programmed in the master mode and used as identifications.

1. Enter memory number: 1 … 999.

2. Press a key CODE A … CODE F.
    The saved fixed text is now assigned to the selected identification Code A … Code F.

Other entry possibilities
Identifications can also be entered with a barcode or RFID reader, see section 4.15, or with an external keypad, see section 4.16.

4.12.2 Clear identifications

➜ Press desired key CODE A … CODE F and clear memory content with $\boxed{c}$.

4.13 Recall information

On the weighing terminal memory contents and system information can be recalled.

1. Press INFO key.
   Then the following function key assignment appears:

DELT	TARE	TEXT	ALIBI	DATE	VERS
Display DeltaTrac values	Display tare weight	Display fixed texts and name of keys CODE A … CODE F	Recall content of alibi memory, see section 4.18. This selection only appears when Alibi-Memory-690 is installed.	Display date and time	Display version numbers of installed software modules

W&M	ERROR	COM	AB	DNGLE	
Display checksum of the software relevant to calibration. The correct checksum is documented in the calibration approval.	Fault / Event memory display	Calling up the settings of the interfaces	Display designation and contents of application blocks including sub-blocks To access directly first enter the number of the desired application block.	Display of production date, number and type of the hardware dongle	

2. Select desired information.
   The information is displayed for the set DISPLAY DURATION, then the weighing terminal changes to the weighing mode again.

Notes

- When several values are displayed, the IND690-Base automatically changes to the next value after the set DISPLAY DURATION.

- With (c) it is possible to switch to the next value or back to the weighing mode.

- When the GA46 printer is connected, the version numbers of the installed software modules are automatically printed.

- After COM has been pressed, the settings of all 9 interfaces are displayed consecutively, for example
  COM1:   RS232
  MODE: DEFAULT
  SETTING: 9600, N, 8, 1
  STATUS: ACTIVE

4.13.1   Recall memory

1. Press INFO key.

2. Enter number of memory and press DELT, TARA or TEXT key depending on desired memory.

Recall name of CODE A … CODE F keys

1. Press INFO key.

2. Press one of the keys CODE A … CODE F.
   The display shows the current Code.

4.13.2   Calling up information on the installed interface modules
Information on the installed interface modules can be called up with the following key combinations:
INFO 50   Type and software version of the installed WLAN module
INFO 51   Status of the WLAN module
INFO 60   Type and software version of the installed Bluetooth module
INFO 61   Status of the Bluetooth module

4.13.3   Recall application-specific information
See operating instructions of the relevant application software.

4.14   Print or transfer data

If a printer or computer is connected, weighing results can be printed out or transferred to the computer.

In the master mode you can set the following for this purpose:

• Data to be printed or transferred,

• Manual or automatic data transfer,

• Key which triggers printing or data transfer.

Factory setting

• Manual triggering with ↵.

• The content of the display is transferred or printed.

4.15   Enter values with barcode or RFID reader

If you have connected a barcode or RFID reader to the weighing terminal, you can make all required entries, such as identifications or target specifications, easily with the barcode or RFID reader.

4.15.1   Read in any desired entries with the barcode or RFID reader

Example   **Read in identification Code A**

1. Press CODE A key; the weighing terminal expects the entry of Code A.

2. Enter identification Code A with the barcode or RFID reader.
    The identification read in appears in the display.

3. Confirm barcode entry with ↵.

4.15.2   Read in a frequently used entry directly with the barcode or RFID reader

If your working procedure repeatedly requires the same entry, you can configure the barcode or RFID reader in the master mode (see page 63) so that no additional keys need to be pressed on the weighing terminal.

Example   **Barcodes are automatically read in as Code A**

If the working procedure requires the entry of Code A:

➜   Enter identification Code A with barcode reader.
    The information read in appears in the display and is automatically processed by the weighing terminal as Code A.

4.16   Working with external keypad

If the weighing terminal is equipped with the interface PS2-690, an external keyboard can be connected so that alphanumerical values can be entered conveniently.
In addition to the alpha and numerical keys, the following additional scale functions can also be operated with the external AK-MFII keypad.

Function for IND690-Base	External keypad	Function for IND690-Base	External keypad
Function key F1	F1	CODE A key	Shift F1
Function key F2	F2	CODE B key	Shift F2
Function key F3	F3	CODE C key	Shift F3
Function key F4	F4	CODE D key	Shift F4
Function key F5	F5	CODE E key	Shift F5
Function key F6	F6	CODE F key	Shift F6
⚖ key	F9	⚖ key	Shift F9
→0← key	F10	→0← key	Shift F10
→T← key	F11	→T← key	Shift F11
PT key	F12	PT key	Shift F12

Note

The language of your external keyboard can be set in the master mode block LAYOUT EXT. KEYBOARD, see page 68.

4.17   Working with a second display

An ID1 Plus, ID3s, ID7 or another IND690 weighing terminal can be connected to the IND690 weighing terminal as a second display.

Conditions

- Interface CL 20mA-690 installed in passive operating mode (factory setting).
- AUTO-DIR setting selected in master mode (see page 56).
- Weighing terminal is connected as second display with cable 00 504 511.

Operation possibilities on second display
The following functions are also possible on the second display:

- Set to zero
- Taring

IND690 as second display
With IND690 as a second display, the weight value fills the entire display (BIG WEIGHT DISPLAY ON).

4.18   Recall data from Alibi memory

With the AlibiMemory-690 memory module you can fulfill your recording obligations in certified operation without having to archive paper.
AlibiMemory-690 automatically assigns every weighing operation a consecutive data record number that also appears on the printout, saves the net and tare value, the date and the time and also the scale number, tare source, MinWeigh and, if necessary, additional ID codes.
Immediately after the following actions, entries are made in the alibi memory:

- Interface commands "S" and "SX"
- Interface command "SR" as soon as a stable weight value has been determined
- Pressing ↵
- Automatic transfer key printout when a certain weight value is reached (AutoPrint)

The AlibiMemory-690 operates according to the principle of a ring memory: When the capacity limit of 675500 data records is reached, the oldest data record is deleted and overwritten with data from the latest weighing.
By entering suitable search criteria you can quickly access the data of a very specific weighing.

4.18.1   Initiate

➜ Press INFO, ALIBI key sequence.
The function keys change to the following assignment:

FIND	>>...		PRINT	-> Num	END
Enter search criteria	Search for next matching data record starting with oldest		Print displayed data record	Search for data record with known data record number	Exit Info Alibi and return to normal mode

4.18.2   Fast search with entry of data record number

1. Press ->Num key.

2. Enter number of data record to be searched for and confirm with ↵.
AlibiMemory-690 now searches for the desired data record.

Notes

• The search may take up to 10 seconds.

• If no data record with the entered number is found, the message NO MATCHING DATA RECORD appears.

4.18.3   Search with other search criteria

➜ Press FIND key.
The function keys are given the following assignment:

DATE	TIME	NET	TARE	START	END
Enter date as search criterion	Enter time as search criterion	Enter net value as search criterion	Enter tare value as search criterion	Start search with entered search criteria	Terminate search

All offered search criteria can be combined with each other.
The entered search criteria are shown in the display in clear text.
This enables you to search for a find a specific weighing.

Enter date

➜ Press DATE key and enter complete date in DD.MM.YY form.

Enter time

➜ Press TIME key and enter desired time in one of following formats.

Format HH   all weighings between HH.00.00 and HH.59.59 are found
Format HH.MM   all weighings between HH.MM.00 and HH.MM.59 are found
Format HH.MM.SS   only the weighing at the time HH.MM.SS is found

Enter net/tare value

1. Press NET or TARE key.

2. Enter weight value and confirm with ↵.
   The function key assignment changes back again for selection of the search criteria.

Note

The weight unit for entering the weight values can be selected with the cursor keys < or >.

Start search

➜ Press START key.
   AlibiMemory-690 searches for the oldest data record which meets the entered search criteria.

Notes

• The search may take up to 10 seconds.

• If no data record with the entered values is found, the message NO MATCHING DATE RECORD appears.

• If no search criterion has been entered, the oldest data record is displayed.

4.18.4   Displaying data records

Found data records are shown in the display on 2 pages. You can change between the two pages with the cursor keys < or >.

Example 1st page

D/Z:	02.04.98	09:25:51	1/2
NUM:	000987		
NET:	25.000 KG		⚖1
TARE:	100,346 KG	PT	

Example 2nd page

ARTICLE NO.   2/2
A: 123456789
ORDER NO.
B: 55555

Scroll forward/back

The key >>… enables you to scroll within the found data records.

Notes

• When, during scrolling with the key >>… all entries of the AlibiMemory-690 have been searched through, the message END OF FILE appears.

• If a weight value has fallen below the set minimum weight, the weight value is also shown in the alibi memory with the symbol 🔢 .

4.18.5   Printing records

1. Press the PRINT key.

2. Press the PRINT key in the next window.

3. Enter the number of the first record to be printed.

4. Enter the number of records to be printed.

5. Enter the output port (COM1 … COM9).
    The selected records are printed at the specified interface.

5   Settings in the master mode

5.1   Overview of the master mode

In the master mode you adapt the IND690-Base weighing terminal to meet your needs. Depending on the configuration, the master mode is divided into 4 or 5 master mode blocks, which are in turn divided into further blocks.
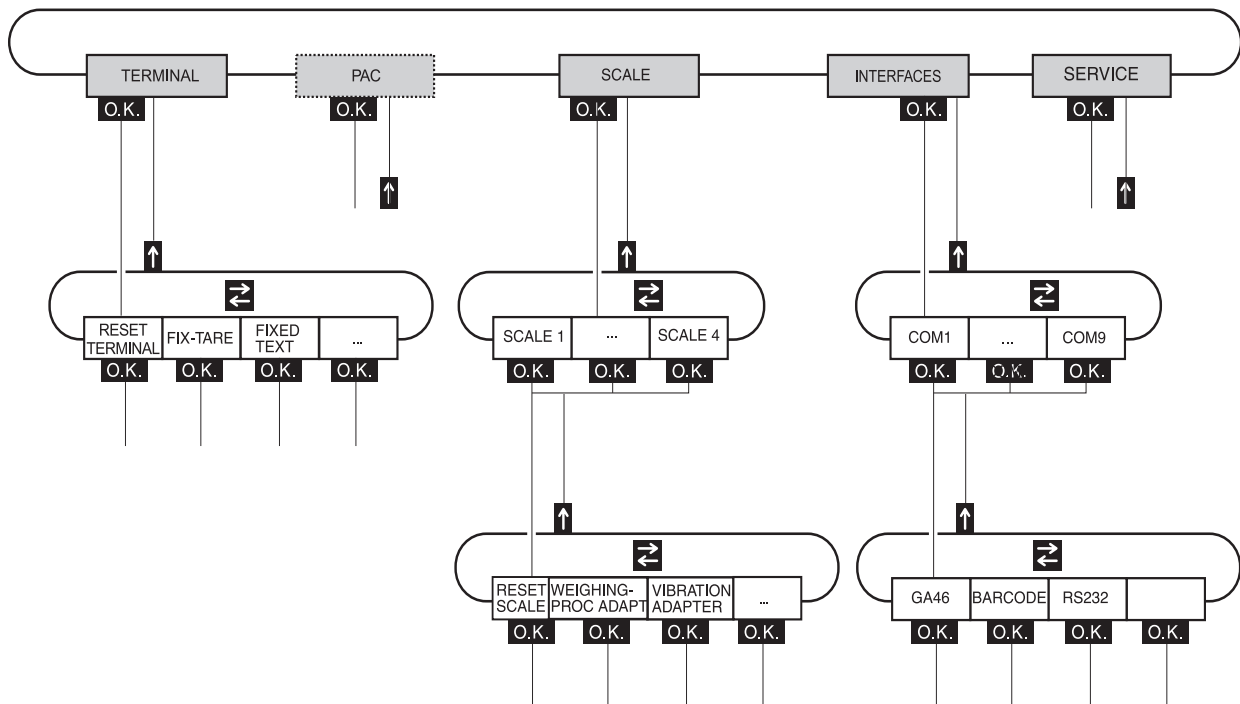
TERMINAL   For system settings, such as entering the date and time or loading permanent texts, see section 5.3.

PAC   To set application-specific parameters, see operating instructions of the respective application software.
APPLICATION is displayed instead at the IND690-Base, see Section 5.4.

SCALE   To select one of the connected weighing platforms. For each selected weighing platform the parameters are then set which concern the weight value, e.g. stability detector, unit, etc., see section 5.5.1.

INTERFACES   To select an interface. The communication parameters are then set for each interface, see section 5.6.

SERVICE   For configuring the weighing platform(s).
On IDNet weighing platforms only for METTLER TOLEDO service technicians.
On weighing platforms with an analog signal output, see service manual A/D converter Point ME-22004256.

5.2 Operating the master mode

5.2.1 Enter the master mode

1. Press MODE key.
   If the current function keys assignment does not contain MODE, press the cursor keys < or > as often as necessary until the MODE key appears.

2. Enter personal code if configured.
   The display shows the first master mode block TERMINAL.

5.2.2 Assignment of function keys in the master mode

Assignment on the top level
On the top level of the master mode the function keys are assigned as follows:

←	→		↑	**END**	**OK**
Change to previous block within a level	Change to next block within a level		Exit level and return to higher-level block	Exit the master mode and return to normal mode	Recall lower-level block or confirm selection

➜ Select the function by pressing the function key.

Example ➜ Press the END key to exit the master mode and return to the normal mode.

When the function keys are otherwise allocated

➜ Press the cursor keys < or > repeatedly until the function key assignment shown above appears.

Assignment in input masks
In input masks for several parameters, the function keys are assigned as follows:

↓↑	<	>	**F▶**	**EDIT**	↑
Select parameters	Setting parameters		Select function of function key F5: EDIT, STD, ADD, INS, etc.	Possible assignments: ADD INS EDIT DEL PRINT STD EDIT GOTO	Accept settings and return to higher-level block

5.2.3 Master mode operation with the navigation keys

Instead of the function keys, it is also possible to use the navigation keys to operate the master mode.

Function key   Navigation key
F1 (←)   <
F2 (→)   >
F4 (↑)   ∧
F6 (OK)   ↵

5.2.4 Orientation in the master mode

For improved orientation the display shows the last steps in the path of the current master mode block.

Example   The upper 3 lines of the display show the following path for selecting the DeltaTrac application FILLING:

Path ⎯

             MASTER MODE
             TERMINAL
              DELTATRAC

Current selection ⎯   FILLING
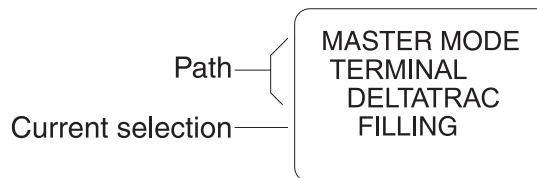
5.2.5 Entries in the master mode

The following basic rules apply to entries made in the master mode:

- Confirm (alpha)numeric entries with ↵.

- Alphanumeric entries with the IND690: see page 24.

- To accept the displayed value: Press ↵.

5.2.6 Emergency entrance into the master mode

If a personal code has been assigned for entering the master mode and you have forgotten your code, you can still enter the master mode:

➜   Enter the character sequence C, L, E, A, R as your personal code.

5.3   TERMINAL master mode block

5.3.1   Overview of the TERMINAL master mode block

In the TERMINAL master mode block you enter the following system settings:

FIX-TARE	LOAD FIX-TARE	CLEAR ALL TARES			
FIXED TEXT	LOAD FIXED TEXT	CLEAR ALL TEXTS			
DELTA-FIX	LOAD DELTA-FIX	CLEAR ALL DELTAS			
DELTATRAC	TYPE	AUTOPRINT WITHIN TOL	PRINT ONLY WITHIN TOL		
LANGUAGE	DEUTSCH	ENGLISH	FRANCAIS	NEDERLANDS	ITALIANO	ESPANOL
KEYS A B C D	KEY A	KEY B	KEY C	KEY D	KEY E	KEY F
DATE / TIME	SET DATE AND TIME	FORMAT	SUMMER TIME		
PERSONAL CODE					
MASTER MODE START POS.	**NORMAL**	LAST POSITION			
SCREEN SAVER	**SCREEN SAVER ON**	SCREEN SAVER OFF			
BIG WEIGHT DISPLAY	**BIG WEIGHT DISPLAY ON**	BIG WEIGHT DISPLAY OFF			
CONTROL MODE	**X10 KEY**	CONTROL MODE ON			
DYNAMIC WEIGHING	**NO PRINT**	AUTO PRINT			
ID5 MODE	**ID5 MODE OFF**	ID5 MODE ON			
ID7 MODE	**ID7 MODE OFF**	ID7 MODE ON			
DISPLAY DURATION	ERROR MESSAGES	INFO MESSAGES			
MODE SCALES	SERIAL SCALE	PARALLEL SCALE			
ACOUSTIC SIGNAL	**ACOUSTIC SIGNAL ON**	ACOUSTIC SIGNAL OFF			
NO SCALE OPERATION	**STANDARD**	DEMO MODE	TERMINAL MODE		
STEALTH MODE	**STEALTH MODE OFF**	STEALTH MODE ON			
RESET TERMINAL					

Legend   • Blocks highlighted in **grey** are described in detail in the following.

    • Factory settings are printed in **bold print**.

5.3.2   Settings in the master mode block TERMINAL

FIXED TARE	Store tare values in the tare memory as a safeguard against power failure
LOAD FIXED TARE	1. Select memory number with GOTO: 1 ... 999.
	2. With ⇩⇧, change to WEIGHT, press EDIT and enter the tare weight in the unit displayed.
	3. With ⇩⇧, change to TEXT, press EDIT and enter the designation of the tare memory, max. 30 characters.
	4. To load additional tare weight constants, press ⇩⇧ and repeat steps 1 to 3.
DELETE ALL TARES	Delete all tare memories.
Notes	• With the cursor keys < or > you can scroll through the existing tare memories.
	• When entering the tare weight, it is possible to change the weight unit with the cursor keys < or >.

FIXED TEXT	Store texts in the text memory as a safeguard against power failure
	These texts can for example be assigned as identifications or can be additionally output when printing.
LOAD FIXED TEXTS	1. Select memory number with GOTO: 1 ... 999.
	2. With ⇩⇧, change to TEXT, press EDIT and enter the designation of the text memory, max. 30 characters.
	3. To load additional fixed texts, press ⇩⇧ and repeat steps 1 and 2.
DELETE ALL TEXTS	Delete all text memories.
Notes	• With the cursor keys < or > you can scroll through the existing text memories.
	• Fixed text No. 20 is displayed when switching on with a restart, see Page 11.

FIXED DELTA	Store target weight/tolerance combinations in DeltaTrac memories as a safeguard against power failure
LOAD FIXED DELTA	1. Select memory number with GOTO: 1 ... 999. 2. With ↓↑, change to TARGET, press EDIT and enter the target weight in the unit displayed. 3. With ↓↑, change to TOL.(−), press EDIT and enter the lower tolerance in the unit displayed. 4. With ↓↑, change to TOL.(+), press EDIT and enter the upper tolerance in the unit displayed. 5. To load additional DeltaTrac constants, press ↓↑ and repeat steps 1 to 4.
DELETE ALL DELTA	Delete all DeltaTrac memories.
Notes	• With the cursor keys < or > you can scroll through the existing DeltaTrac memories. • When entering the target weight and tolerances, it is possible to change the weight unit with the cursor keys < or >. • The terminal suggests symmetrical tolerances TOL. (+) and TOL. (−). However, different tolerances are also permissible.

DELTATRAC	Set DeltaTrac application
TYPE	Select DeltaTrac application
FILLING	Weigh in target weight within a tolerance range (factory setting)
CLASSIFYING	Evaluate the test samples as good, too light or too heavy based on the target weight and tolerance
CHECKWEIGHING	Determine difference between target and actual weight
AUTO PRINT WITHIN TOL	Automatic printout when actual weight lies within the specified tolerance
PRINT ONLY WITHIN TOL	Printout only when actual value lies within the specified tolerance
MIN. DELTA	Specify minimum target weight, adjustable from 10 ... 100 d, factory setting: 40 d

LANGUAGE	Select dialog language
	Possible settings: German, English, French, Dutch, Italian, Spanish

KEYS A B C D E F	Name identification keys CODE A ... CODE F
KEY A (B, C, D, E, F)	Identification data CODE A (CODE B, CODE C, CODE D, CODE E, CODE F)
TEXT	Naming the ID key
LENGTH	Max. 30 characters possible, factory setting: 20 characters
REQUEST FOR INPUT	Set request for input for the selected key Possible settings: OFF CODE A (CODE B, CODE C, CODE D, CODE E, CODE F) does not have to be entered RENEW A new identification must be entered for every weighing REUSE An identification can be used for several weighings

DATE / TIME	Enter date and time
SET DATE AND TIME	
DATE	Enter date in the displayed format
TIME	Enter time in the displayed format
FORMAT	
DATE	Select date format Possible settings: DD.MM.YY (factory setting), MM.DD.YY, YY.MM.DD, DD.MM.YYYY, MM.DD.YYYY, YYYY.MM.DD
SEP	Select separating character in date format Possible settings: "." (factory setting), ":", "/", "–"
TIME	Select time format Possible settings: HH:MM:SS 24 h (factory setting), HH:MM:SS 12 h, HH:MM 24 h, HH:MM 12 h
SEP	Select separating character in time format Possible settings: ":" (factory setting), "."

DATE / TIME	Enter date and time
SUMMER TIME	
SUMMER TIME OFF	No automatic changeover to summer time

SUMMER TIME ON	Configure automatic changeover to summer time
	Other settings, factory settings in brackets:
	START WEEKDAY (Sunday)
	              WEEK (4)
	              MONTH (MARCH)
	              TIME (2:00)
	END WEEKDAY (Sunday)
	              WEEK (4)
	              MONTH (October)
	              TIME (03:00:00)

PERSONAL CODE	Load or delete code for entering the master mode
CODE	Enter code with a maximum of 8 alphanumeric characters.
Comment	• If no code is entered, access to the master mode is unrestricted. • The personal code can be entered as ASCII characters (default), hexadecimal code (activation using the IDENT E key) or decimal code (activation with the IDENT F key).

MASTER MODE START POS.	Select start position for entering the master mode
NORMAL	Selection of the master mode blocks always begins with the TERMINAL block (factory setting).
LAST POSITION	When entering the master mode, the last block edited is displayed immediately.

SCREEN SAVER	Switch screen saver on or off
WAITING TIME	Enter time until screen saver is activated. Possible values: 1 … 60 minutes
Comment	To hold all display elements at the same luminosity, we recommend not switching off the screen saver.

BIG WEIGHT DISPLAY	Switch full-display indication of the weight on or off
	Factory setting: BIG WEIGHT DISPLAY ON

CONTROL MODE	Adjust control mode
X10 KEY	Activation of control mode with X10 key (factory setting).
CONTROL MODE ON	This setting is only possible with non-certified scales. The weighing terminal always operates with the higher resolution.

DYNAMIC WEIGHING	Set printing during dynamic weighing
NO PRINT	Results during dynamic weighing are not automatically printed out (factory setting).
AUTO PRINT	Each result during dynamic weighing is automatically printed. Dynamic weights are marked with "Result:" on the printout.

ID5 MODE ID7 MODE	Deactivating or activating downward compatibility with ID5 or ID7
	If ID5 MODE ON or if ID7 MODE ON is selected, the IND690 is operated with downward compatibility to the ID5 or ID7. This also applies to the other application pacs. For details please contact the METTLER TOLEDO customer service. Factory setting: ID5 MODE OFF, ID7 MODE OFF

DISPLAY DURATION	Set display duration for messages
ERROR MESSAGES	Set display duration for error messages; factory setting: 2 seconds
INFO MESSAGES	Set display duration for informational messages; factory setting: 3 seconds
STATUS MESSAGES	Set the display duration for status messages, factory setting: 3 seconds

MODE SCALES	Select between serial and parallel operating mode for the connected scales
SCALES SERIAL	Serial operation of the connected scales: Only the weight value of the current scale is displayed.
SCALES PARALLEL	Parallel operation of the connected scales: All weight values of the connected scales are displayed simultaneously.
SUM SCALE	A sum scale can be defined in parallel scale operation. 1. SUM SCALE: Select ACTIVATED. 2. With ↓↑, change to SCALE 1 and select YES with < or > if this scale is to be the sum scale. 3. Repeat the procedure for SCALE 2 - SCALE 4. Factory setting: SUM SCALE DEACTIVATED

ACOUSTIC SIGNAL	Signal tone On/Off
	Factory setting: SIGNAL ON

OPERATION WITHOUT SCALE	Set the behaviour when the weighing terminal is operated without a scale
	IND690 searches for connected weighing platforms while booting. If no scale is found, the following behaviour patterns are possible.
STANDARD	If no scale is found, the booting process stops and the message NO SCALES DETECTED is displayed (factory setting). To continue the booting process press the SCALE key. During operation a virtual scale is shown whose weight value can be changed and which otherwise behaves like a "real" scale.
DEMO	If no scale is found, the message NO SCALES DETECTED is displayed briefly. During operation a virtual scale is shown whose weight value can be changed and which otherwise behaves like a "real" scale.
TERMINAL	If no scale is found, the message NO SCALES DETECTED is displayed briefly. A scale is not displayed during operation, the message TERMINAL is shown. All the scale-specific functions, keys and application blocks are deactivated.

STEALTH MODE	Switch the scale on/off without weight display
	Under certain circumstances, such as high quality goods or top secret recipes, working without a weight display may be desirable. The DeltaTrac is then the only filling aid.
DELTATRAC	Select the display behaviour of the DeltaTrac optical weighing aid
STANDARD	"Normal" DeltaTrac, high resolution in the range of the target weight
LINEAR	The optical weighing aid behaves linearly to the weighed-in weight
STANDARD-I	The display behaviour of the DeltaTrac is inversely to that of the "normal" DeltaTrac
Comment	STEALTH MODE can only be activated at non-certifiable scales.

RESET TERMINAL	Reset all terminal functions to the factory setting	
	DELTATRAC	Filling
		Autoprint within tol: no
		Print only within tol: no
		Min.Delta = 40 d
	DATE/TIME	Format = DD.MM.YY / HH:MM:SS 24h
		Summertime: off
	MASTER MODE START POS.	Normal
	SCREENSAVER	ON
	BIG WEIGHT DISPLAY	On
	DYNAMIC WEIGHING	No printout
	CONTROL MODE	X 10 key
	ID5 MODE	Off
	ID7 MODE	Off
	DISPLAY DURATION	2 / 3 seconds
	MODE SCALES	Serial
	ACOUSTIC SIGNAL	on
	OPERATION WITHOUT SCALE	Standard
	STEALTH MODE	Off
Comment	The memories are not affected by this.	

5.4 APPLICATION master mode block

This block is only displayed at the IND690-Base.

TOTALIZING	Adapting the totalizing function
	If TOTALIZING ON is selected, the following setting options are displayed.
FUNCTION KEYS	Displaying/hiding the function keys permitted for totalizing
TARG	Display/hide the TARG key
MAN	Display/hide the MAN key
CANC	Display/hide the CANC (cancel) key
ITEM	Display/hide the ITEM (item counter) key
MINIMUM DEFLECTION	Entry of the minimum deflection that has to be exceeded so that the next item can be totalized. Possible settings: 1 … 999 d Factory setting: 10 d
TRANSACTION NUMBER	The transaction number is increased by 1 at every totalization. When the transaction number has reached 999 999, it begins again at 000 001. Nonetheless the transaction number in this block can be set to a specific value.
SQC FUNCTION	Recording of the mean value standard deviation, minimum and maximum Factory setting: SCQ FUNCTION OFF
RESET APPLICATION	Reset the TOTALIZING function to the factory setting

5.5 SCALE master mode block

The weighing platform is selected in the first block: SCALE 1 … SCALE 4 and SCALE Σ for IND690 or SCALE 1 … SCALE 3 and SCALE Σ for IND690xx and IND690-24V.

The SCALE master mode block depends on the connected weighing platform.
METTLER TOLEDO industrial scales   see Section 5.5.1
METTLER TOLEDO SICS scales   see Section 5.5.2
LabTec X-/XP-/XS scales   see Section 5.5.3
WM/WMH scales   see Section 5.5.4
Sum scale   see Section 5.5.5

5.5.1   SCALE master mode block for METTLER TOLEDO industrial scales

Overview

In the SCALE master mode block the following settings for the weight can be carried out:
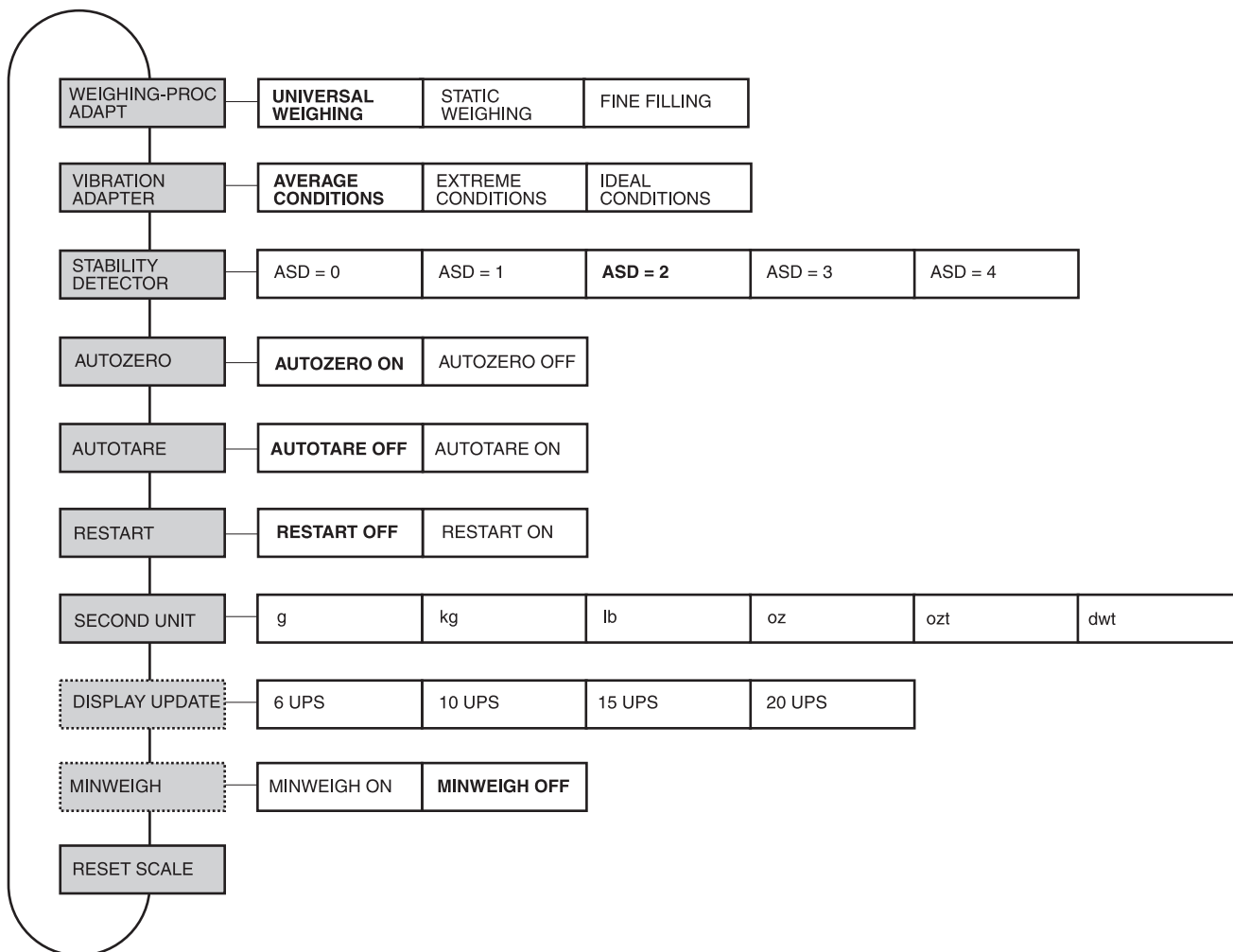
WEIGHING-PROC ADAPT	**UNIVERSAL WEIGHING**	STATIC WEIGHING	FINE FILLING			
VIBRATION ADAPTER	**AVERAGE CONDITIONS**	EXTREME CONDITIONS	IDEAL CONDITIONS			
STABILITY DETECTOR	ASD = 0	ASD = 1	**ASD = 2**	ASD = 3	ASD = 4	
AUTOZERO	**AUTOZERO ON**	AUTOZERO OFF				
AUTOTARE	**AUTOTARE OFF**	AUTOTARE ON				
RESTART	**RESTART OFF**	RESTART ON				
SECOND UNIT	g	kg	lb	oz	ozt	dwt
DISPLAY UPDATE	6 UPS	10 UPS	15 UPS	20 UPS		
MINWEIGH	MINWEIGH ON	**MINWEIGH OFF**				
RESET SCALE						

Legend

- Blocks highlighted in **grey** are described in detail in the following.
- Factory settings are printed in **bold print**.
- Blocks which only appear under certain conditions have a **dotted outline**.

Settings

WEIGHING-PROC ADAPT	Adapt weighing platform to weighing sample
UNIVERSAL WEIGHING	For solid bodies, coarse filling or checkweighing (factory setting).
STATIC WEIGHING	For solid bodies and weighing under extreme conditions, e.g. strong vibrations or weighing animals.
FINE FILLING	For liquid or powdered weighing samples.

VIBRATION ADAPTER	Adapt weighing platform to the vibration influences of the environment
AVERAGE CONDITIONS	Factory setting.
EXTREME CONDITIONS	The weighing platform operates more slowly, however is less sensitive, e.g. suitable with building vibrations and vibrations at the weighing location.
IDEAL CONDITIONS	The weighing platform operates very quickly, however is very sensitive, e.g. suitable with very calm and stabile weighing location.

STABILITY DETECTOR	Adapt automatic stability detector
	Possible settings: ASD = 0 Stability detector switched off (only possible with non-certified weighing platforms) ASD = 1 fast display good reproducibility ASD = 2 ▲ ▼ (factory setting) ASD = 3 ▲ ▼ ASD = 4 slow display very good reproducibility

AUTOZERO	Switch automatic zero-point correction on or off
	The automatic zero-point correction corrects the weight of minor dirt with the weighing platform unloaded. Factory setting: AUTOZERO ON
Comment	On certified weighing platforms the zero-point correction is always switched on.

AUTOTARE	Configuring automatic taring
AUTO SET TARE	Activate/deactivate automatic taring
OFF	No automatic taring, factory setting
ON	Taring when the weight threshold is exceeded
AUTO CLEAR TARE	Activate/deactivate automatic clearing of the tare
OFF	No automatic clearing of the tare weight, factory setting
ON	Delete the tare automatically when the weight drops below the weight threshold
THRESHOLD	Entry of the weight threshold at which taring or tare clearing is carried out. Possible settings: 1 d … 99 d, factory setting: 10 d

RESTART	Switch restart function on or off
	When RESTART ON is set, the zero point and tare value remain stored after the power supply is interrupted. When the weighing platform is switched on again, the terminal shows the current weight. Factory setting: RESTART OFF

SECOND UNIT	Select second weight unit		
	Possible units: g, kg, lb, oz, ozt, dwt		
	Unit	**Abbreviation**	**Conversion to g**
	Kilogram	kg	= 1000 g
	Pound	lb	≈ 453.59237 g
	Ounce	oz	≈ 28.349523125 g
	Troy Ounce	ozt	≈ 31.1034768 g
	Pennyweight	dwt	≈ 1.555173843 g
	Gram	g	= 1 g
Comment	On certified weighing platforms only the units permitted by certification appear.		

DISPLAY UPDATE	Set display speed of the weight display
	Select number of updates per second (UPS). Possible values: 6, 10, 15, 20 UPS
Comments	• This block only appears when the DISPLAY UPDATE function is supported by the connected weighing platform. • The possible settings are dependent on the connected weighing platform.

MINWEIGH	Configure minimum weighing-in quantity
MINWEIGH ON	In this setting, the blinking symbol ⌃ appears in the display when the weight on the scale falls below the stored minimum weight.

TYPE	Determining the minimum weight:
	CALCULATED The minimum,5 weight is calculated:
	          U_0 Measurement uncertainty when the load approaches 0.
	          TOL Required tolerance
	          SF Safety factor
	          MINWEIGH Calculated value based on the parameters entered above
	DIRECT Enter MINWEIGH value directly

MINWEIGH OFF	No monitoring of the minimum weighing-in quantity (factory setting)
Comment	MINWEIGH is only available if monitoring of the minimum weighing-in quantity is activated in service mode.

RESET SCALE	Reset weighing platform to factory setting
	WEIGHING-PROC ADAPT universal weighing VIBRATION ADAPTER average conditions STABILITY DETECTOR ASD = 2 AUTOZERO on AUTOTARE off RESTART off MINWEIGH off

5.5.2 SCALE master mode block at SICS scales

Only the following settings for the weight value can be carried out at METTLER TOLEDO SICS scales:

SCALE	Settings for the weighing value at SICS scales
AUTOTARE	
SECOND UNIT	For details see Section 5.5.1
MINWEIGH	

5.5.3   SCALE master mode block at LabTec X-/XP-/XS scales

The following settings for the weight value can be carried out at METTLER TOLEDO LabTec X-/XP-/XS scales:

SCALE	Settings for the weighing value at LabTec X-/XP-/XS scales
WEIGHING MODE	For details see below
CONDITIONS	
MEASURED VALUE ENABLE	
TEST WEIGHT	
TEST CALIBRATION	
AUTOZERO	For details see Section 5.5.1 Display update is set fixed to 10 UPS
AUTOTARE	
RESTART	
SECOND UNIT	
DISPLAY UPDATE	
MINWEIGH	

WEIGHING MODE	Adapt the weighing platform to the weighing sample
UNIVERSAL	For all the common weighing processes
FILLING	For liquid or powdered weighing sample
SENSOR MODE	Supplies a weighing signal that is filtered to different degrees depending on the setting of the ambient conditions. The filter behaves linearly (not adaptatively) with regard to time and is suitable for continuous measured value processing
CHECK WEIGHING	The scale only reacts to larger weight changes, the weighing result is very stable

CONDITIONS	Adapt the weighing platform to the conditions
STANDARD	Normal conditions, factory setting
RESTLESS	The scale operates slower, but is less sensitive. Suitable, for example, for building oscillations and vibrations at the weighing location
VERY RESTLESS	The scale operates very slowly, but is even less sensitive. Suitable, for example, for strong building oscillations and extreme vibrations at the weighing location
CALM	The scale operates very fast, but is very sensitive. Suitable, for example, for a very calm and stable weighing location

MEASURED VALUE ENABLE	Adapt the reproducibility	
VERY FAST	Rapid display	good reproducibility
FAST	▲	▼
RELIABLE + FAST	▲	▼ (factory setting)
RELIABLE	▲	▼
VERY RELIABLE	Slow display	excellent reproducibility

TEST WEIGHT	Test weight used to check the calibration
SET EXT CALIBRATION WEIGHT	Enter the weight value of the external calibration weight

TEST CALIBRATION	Settings used to check the calibration
CALIBRATION WEIGHT	
INTERNAL	Checking with the internal calibration weight
EXTERNAL	Checking with external calibration weights as entered under TEST WEIGHT External calibration weights are not possible at certified scales
Comment	For the course and starting refer to the LabTec X-/XP-/XS scales documentation

5.5.4 SCALE master mode block at WM/WMH scales

The following settings can be carried out at METTLER TOLEDO WM/WMH scales:

SCALE	Settings at WM/WMH scales
DIRECT TALK	For details, see the next page
REMOTE TALK	
TEST WEIGHT	For details see Section 5.5.3
TEST CALIBRATION	
AUTOZERO	For details see Section 5.5.1 Display Update can be configured using "Direct talk"
AUTOTARE	
RESTART	
SECOND UNIT	
DISPLAY UPDATE	
MINWEIGH	

DIRECT TALK	Direct communication between IND690 and WM/WMH scale
	When DIRECT TALK is activated, commands can be entered and sent to the WM/WMH scale by using the SEND function key.
	In weighing mode the following information is displayed:
	SEND sent command
	RCVD answer received from the WM/WMH scale
	The possible commands are described in the WM/WMH operating instructions.

REMOTE TALK	Configuration at the PC, display at the IND690
	When REMOTE TALK is activated, commands to the WM/WMH scale have to be processed on a PC.
	In weighing mode the following information is displayed:
	SENT sent command
	RECD answer received from the WM/WMH scale
	Start command: RTS_x, whereby x is the scale number
	End command: RTE
	The possible commands are described in the WM/WMH operating instructions.

5.5.5 SCALE master mode block Σ

SCALE Σ	Setting a sum scale
SCALE RESOLUTION	Select the scale resolution of the sum scale
METROLOGICAL	The sum scale resolution corresponds to the coarsest scale involved or the coarsest weighing range respectively
MATHEMATICAL	The weight values are totalized mathematically correctly
CALCULATION	Calculation basis for the total
NORMAL	The displayed weight values are added
HIGHRES	The high-resolution weight values are added

5.6   INTERFACE master mode block

Select the interface connection

➜ Select the interface connection in the first block:
     COM1 … COM9.

Select interface type

➜ Specify the interface type for the selected interface connection COM1 … COM9.

COM1 ... COM9	
NOT ASSIGNED	If the selected interface connection is not assigned.
GA46	For connecting the printer GA46/GA46-W. The data is exchanged via an RS232 interface. The other setting possibilities are described in the operating and installation instructions GA46.
BARCODE RFID	For connecting a barcode or RFID reader. The data is exchanged via an RS232 interface. For additional settings, see Section 5.6.2.
RS232	This requires an RS232 interface to be connected at the selected interface connection. For additional settings, see Section 5.6.1.
IDNET SCALE	Only for COM2 … COM5 (IND690) or for COM2 … COM4 (IND690xx, IND690-24V) This requires an interface IDNet-690 to be installed at the selected interface connection. For additional settings in the master mode block SCALE, see Section 5.5.
ANALOG SCALE	Only for COM2 … COM5 (IND690) or for COM2 … COM4 (IND690xx, IND690-24V) This requires an interface AnalogScale-690 to be installed at the selected interface connection. For additional settings in the master mode block SCALE, see Section 5.5.
SICS SCALE	Only for COM2 … COM5 (IND690) or for COM2 … COM4 (IND690xx, IND690-24V) This requires an interface SICS-Scale-690 to be installed at the selected interface connection. When SICS SCALE is selected, the following default settings are set: SICS mode, 9600 baud, 8 data bits, 1 stop bit, no parity. For additional settings, see Section 5.6.1.
ALIBI MEMORY	Only for COM2 … COM9. This requires an AlibiMemory-690 to be installed at the selected interface connection. For additional settings, see Section 5.6.3.
CL20MA	Only for COM2 … COM9. This requires an interface CL20mA-690 to be installed at the selected interface connection. For additional settings, see Section 5.6.1.

COM1 … COM9	
RS422 RS485	Only for COM2 … COM9. This requires an interface RS485/422-690 to be installed at the selected interface connection. For additional settings, see Section 5.6.1.
4 I/O	Only for COM5/COM6. This requires an interface 4 I/O-690 with a relay box 4-690 to be installed at the selected interface connection. For additional settings, see Section 5.6.4.
RELAY BOX 8	Only for COM2 … COM9. This requires an interface RS485/422-690 with a relay box 8-690 to be installed at the selected interface connection. For additional settings, see Section 5.6.4.
ARM100	Only for COM2 … COM9. This requires an interface RS485/422-690 with ARM100 to be installed at the selected interface connection. For additional settings, see Section 5.6.4.
ANALOG OUTPUT	Only for COM5/COM6. This requires an interface AnalogOut-690 to be installed at the selected interface connection. For additional settings, see Section 5.6.6.
ETHERNET	Only for COM2 … COM9. This requires an interface Ethernet-690 to be installed at the selected interface connection. For additional settings, see Section 5.6.7.
PROFIBUS-DP	Only for COM2 … COM9. This requires an interface ProfibusDP-690 to be installed at the selected interface connection. For additional settings, see Section 5.6.8.
WLAN	Only for COM2 … COM9. This requires an interface WLAN-690 to be installed at the selected interface connection. For additional settings, see Section 5.6.9.
BLUETOOTH	Only for COM2 … COM9. This requires an interface Bluetooth-690 to be installed at the selected interface connection. For additional settings, see Section 5.6.10.
BT-BLD DISPLAY	Only for COM2 … COM9. For direct connection of the "BLD Display" as a second display. This requires an interface Bluetooth-690 to be installed at the selected interface connection. For additional settings, see Section 5.6.10.

COM1 ... COM9	
BT-P42	Only for COM2 ... COM9. For direct connection of the "BT-P42" printer. This requires an interface Bluetooth-690 to be installed at the selected interface connection. For additional settings, see Section 5.6.10.
BT-BARCODE	Only for COM2 ... COM9. For connection of a Bluetooth barcode reader. This requires an interface Bluetooth-690 to be installed at the selected interface connection. For additional settings, see Section 5.6.10.
BT-SICS SCALE	Only for COM2 ... COM5 (IND690) or for COM2 ... COM4 (IND690xx, IND690-24V) This requires an interface Bluetooth-690 to be installed at the selected interface connection. When SICS SCALE is selected, the following default settings are set: SICS mode, 9600 baud, 8 data bits, 1 stop bit, no parity. For additional settings, see Section 5.6.10.
USB	Only for COM2 ... COM9. This requires an interface USB-690 to be installed at the selected interface connection. For additional settings, see Section 5.6.1.
KEYBOARD PS2	For connecting an external keyboard. Only for COM9. This requires an interface PS2-690 to be installed at COM9. For additional settings, see Section 5.6.5.

5.6.1   Settings in the master mode blocks RS232, RS422, RS485, CL20mA, USB

RS232, RS422, RS485, CL20mA, USB	
OPERATING MODE	This selection only appears with the RS485 master mode block.
1:1 CONNECTION	Weighing terminal and peripheral are directly connected.
BUS SLAVE	For operating the weighing terminal in a bus system. The following parameters are set automatically for the dialog: No handshake, no continuous transmission, no transfer string, fixed string framing $C_R L_F$. The PC is the master, the terminals act as slaves and only transmit when requested to do so by the master. The master must also wait until after sending out a command until the slave's answer is received. Each terminal must be assigned a unique address. Additional setting: ENTER TERMINAL ADDRESS. Possible addresses: 1 … 31
COMMUNICATION	Set communication parameters (factory settings are shown in bold print). All parameters are shown on a display page and can be set there; for function key assignment, see page 59.
BITS PER CHARACTER	Possible settings: 7 bits, **8 bits**
STOPBITS	Possible settings: **1 stop bit,** 2 stop bits
PARITY	Possible settings: Parity even, parity odd, parity space, parity mark, **no parity**
BAUDRATE	Possible settings: 150, 300, 600, 1200, 2400**,** 4800, **9600**, 19200, 38400, 57600 baud
MODE	Set operating mode. This selection does not appear when interface RS485/422-690 is operated in the BUS SLAVE operating mode.
STANDARD SETTING	Set operating mode to factory setting: MMR dialog mode, no handshake, no auto transmission (no continuous transmission), transfer string: Standard, string framing: $C_R L_F$
DIALOG MODE	For dialog between weighing terminal and computer. For other settings see next section.
PRINT MODE	To print weighing data, e.g. on a form printer. For other settings see page 58.

Set dialog mode

DIALOG MODE	Set dialog between weighing terminal and computer
MMR	For information on dialog mode with the MMR command set, see page 78. All parameters are shown on a display page and can be set there.
HANDSHAKE	Possible settings: • NO HANDSHAKE • CL HANDSHAKE – for additional information on the CL handshake, see page 128. • XON-XOFF PROTOCOL.
AUTOMATIC CONTINUOUS TRANSMISSION	This block does not appear with the RS485/422-690 interface. Possible settings: • NO AUTO TRANSMISSION. • AUTO SIR – after each measuring cycle a stabilized or dynamic weight is transmitted. • AUTO DIR – weight values are transmitted as with AUTO SIR and additionally, the special characters in the display are transmitted for a second display. Fixed communications parameters: 9600 baud, 7 data bits, 2 stop bits, parity even • AUTO SR – after each weight change which is greater than the set value, a motionless weight value and then a dynamic weight value are sent
TRANSFER STRING	This block does not appear with the RS485/422-690 interface. Possible settings: • STANDARD – gross, net, tare • OPTION 082/083 – gross, net, tare in GNT form, see operating instructions, Option 082. • USER-DEFINED – enter numbers of the application blocks which are to be transmitted or printed out.
STRING FRAMING	Possible settings (factory settings are printed in **bold print**): • CR **Yes**/No • LF **Yes**/No • <STX>---<ETX> Yes/**No** • BLOCK CHECK CHAR Yes/**No**
SICS	Dialog mode with Standard Interface Command Set (SICS), see page 91.
STANDARD	Standard setting: no handshake, no auto transmission.
HANDSHAKE	Possible settings as MMR, see above.
AUTOREPEAT	Possible settings as MMR, see above. AUTO-DIR not possible with SICS.

DIALOG MODE	Set dialog between weighing terminal and computer
TOLEDO CONTINUOUS	For the continuous transmission of net and tare values to METTLER TOLEDO devices, e.g. to a second display. For a description, see page 89. This block does not appear with the RS485/422-690 interface.
TRANSFER RATE	Set the data transfer rate Possible settings: 25%, 33%, 50%, 100% Factory setting: 100%
CHECKSUM ON	Checksum byte active, factory setting
CHECKSUM OFF	Checksum byte inactive, the transfer format is shortened by 1 character.
WEIGHT FORMAT	Possible settings: • Leading zeroes (factory setting) • Leading blanks
TOLEDO SHORT CONTINUOUS	For the continuous transmission of net values to METTLER TOLEDO devices, e.g. to a second display. For a description, see page 89. This block does not appear with the RS485/422-690 interface.
TRANSFER RATE	Set the data transfer rate Possible settings: 25%, 33%, 50%, 100% Factory setting: 100%
CHECKSUM ON	Checksum byte active, factory setting
CHECKSUM OFF	Checksum byte inactive, the transfer format is shortened by 1 character.
WEIGHT FORMAT	Possible settings: • Leading zeroes (factory setting) • Leading blanks
PE SEND CONTINUOUS	For connecting a PE balance as a reference balance, only with IND690-Count and Interface CL20mA-690.
SECOND DISPLAY	Used to connect an IND4xx terminal as a second display

Set print mode

PRINT MODE	Configure printout on an external printer
HANDSHAKE	Possible settings: • NO HANDSHAKE • XON-XOFF PROTOCOL
LINE LENGTH	Enter number of characters per line. Possible settings: 1 … 240 characters Factory setting: 40 characters
LINE FRAMING	Enter ASCII character for line framing. Possible settings: ASCII 0 … 255 Factory setting: ASCII 013 010 (C_RL_F)
REPORT TYPE	Assignment of one of two possible printout formats to the configured printer. Possible settings: • REPORT TYPE A e.g. for barcode printer • REPORT TYPE B e.g. for A4 printer

CONFIGURATION PRINTOUTS
 	
    TRANSFER KEY
    CODE A KEY
    …
    CODE F KEY
    DYNAMIC KEY
    PAC KEYS
	Configuration of the printouts assigned to the individual keys.
	For each offered key, the current configuration can be printed out with the key sequence CHANGE CONFIGURATION, F▶ (possibly several times) and PRINT.
	
	Configuration options:
	• CHANGE CONFIGURATION See next section
	• DEFAULT SETTING Key-specific, if existent
	• DELETE ALL All blocks of the data string are deleted
	• PAPER FEED Adjustment range: 0 … 9 lines
	• REPORT ON/OFF Switch key printout on/off
	• # OF COPIES Setting range: 1 … 9 copies
	    Factory setting: 1 copy
	
	Only for the **transfer key**:
	• PRINT INTERLOCK Prevents the same article from being weighed several times
	   ZERO LIMIT The weighing platform has to be unloaded at least under the zero limit before a new article can be weighed
	    Setting range: 1 … 99 d
	    Factory setting: 10 d
	   MIN. DEFLECTION The weighing platform has to be deflected by at least the minimum deflection before the new article is weighed
	    Setting range: 1 … 99 d
	    Factory setting: 30 d

PRINT MODE	Configure printout on an external printer
AUTOMATIC PRINTOUT	Switch automatic printout for transfer key on/off. When AUTO PRINTOUT ON is selected, a printout for the transfer key is automatically created for each weight change > x digits. Possible settings: 1 ... 255 digits (factory setting: 30 digits)
DECIMAL FORMAT	Decimal display
DOT (.)	Decimal point (factory setting)
COMMA (,)	Decimal comma
PRINT LIST	Print settings
COMPLETE LIST	Print a complete list of all the parameters
LIST AB	Print only application blocks
LIST SCALE	Print only the scale parameters
LIST INTERFACES	Print only the interface parameters
LIST KEY CONFIGURATIONS	Print only the key configurations

Change configuration

Function keys   The function keys are assigned in CHANGE CONFIGURATION as follows:

	<	>	F▶	ADD	↑
	Display previous entry	Display next entry	Select function of function key F5: ADD, INS etc.	ADD INS EDIT DEL PRINT	Return to next highest level; changes are not saved

The printout can be edited with function key F5:

ADD	Adds a new entry at the end of the printout.
INS	Inserts a new entry in front of the displayed entry.
EDIT	Changes into the EDIT mode for the displayed entry to edit the entry.
DEL	Deletes the displayed entry.
PRINT	Creates a key printout.

EDIT mode

Function keys The following function keys are available in the EDIT mode:

<–>	<	>	F▶	SAVE	↑
Select parameters	Set parameters, scroll back	Set parameters, scroll forward	Select function of function key F5: SAVE, EDIT	Confirm changes and return to higher level	Cancel EDIT mode and return to higher level; changes are not saved

Display page The setting of the parameters of an entry appears in a clear layout on a display page (example):

```
┌─────────────────────────────────────────────────────────┐
│ TRANSFER KEY          [EDIT]                      (2/7)   │
│ TYPE: AB                          STYLE: ══ ⊔ ──          │
│ CRLF: YES        FILL: NO          PAD: 01                │
│ DATA:                               011-013              │
└─────────────────────────────────────────────────────────┘
```
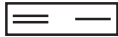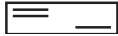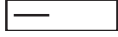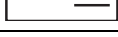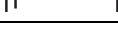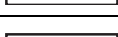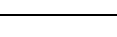
First display line Information for orientation in an entry
- Key name
- Mode: EDIT, INS or ADD
- Number of the display entry and total number of entries for the current printout.
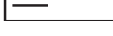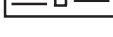
TYPE parameter Selection possibilities:

AB   Output content of an application block with or without designation

TEXT   Print out any desired text

CHRn   Insert n of any desired ASCII characters in the line, e.g. for tables; selection of character via DATA parameter

LINE   Blank line or separator line with any desired alphanumeric characters

DB   Accesses a database field. When a field is printed out, all entries of the field are listed.
The option DB is only available when the software application supports access to a database.
The offered database fields are application-specific.
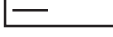
STYLE parameter		STYLE determines in which format the designation and content of the application block are printed; adjustment possibilities:

TYPE	STYLE	
AB DB	�1	Designation and content in grouped style
	▭	Designation and content in two lines, grouped style
	▭	Designation and content separated with extra blank spaces
	▭	Content alone, left-justified
	▭	Content alone, centred
	▭	Content alone, right-justified
TEXT	▭	Left-justified
	▭	Centred
	▭	Right-justified

CRLF parameter   Force line feed; the CRLF parameter is only available for:

- ▭ Text, left-justified

- ▭ Content alone, left-justified

- ▭ Designation and content separated with extra blank spaces

- Type CHRn
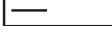
FILL parameter   Show content with leading blank spaces up to maximum available length; the FILL parameter is only available for:

- ▭ Designation and content separated with extra blank spaces

- ▭ Content alone, left-justified

- ▭ Content alone, centred

PAD parameter   Show designation and content separated with x blank spaces
Possible settings: 0 … 63 extra blank spaces.
The PAD parameter is only available for:

- ▭ Designation and content separated with extra blank spaces

- ▭ Content alone, left-justified

DATA/FIELD parameter Depending on the TYPE selected, DATA or FIELD is available.

TYPE	DATA/ FIELD	ENTRY
LINE	DATA	1 alphanumeric character Entry also possible as ASCII code, see below
AB	DATA	Number of application blocks to be output: xxx The application block can be further specified with the following keys: AB_EXT: _ For selecting read-only memories: xxx_yyy SUB-BLK: . For selecting a sub-block: xxx.z or xxx_yyy.z RANGE: - For entering a range: xxx-xxx or xxx_yyy-yyy
CHRn	DATA	1 alphanumeric character Entry also possible as ASCII code, see below
TEXT	DATA	Alphanumeric characters
DB	FIELD	Select database field

Entry of DATA parameter To enter data or select database fields, the EDIT mode must be active.

1. Press **F▶** key, repeat if necessary until the assignment of the F5 key changes to EDIT.
2. Press the EDIT key; an input mask appears.
3. Enter data in the format and with the keys offered.
4. Complete entry with ↵.

Enter ASCII code for LINE and CHRn parameters

1. Open the entry mask with the EDIT key.
2. Press IDENT F and enter the ASCII code numerically.
3. Complete the numeric entry with IDENT F.
4. Complete entry with ↵.

5.6.2 Set barcode or RFID reader

BARCODE, RFID	Set barcode or RFID reader
TYPE	
DL900/DL910/ DLL6000/LS3603/ GRYPHON BT100/ HERON-G D130/ FIRESCAN D131 …	Select barcode or RFID reader. When one of the barcode or RFID readers is selected, the communication and mode parameters for the selected barcode or RFID reader are automatically set.
OTHER	For other barcode or RFID readers: Settings in the sub-blocks COMMUNICATION and MODE as for the blocks RS232/ RS422/RS485/CL20mA/USB, see page 5.6.1. The PRINT MODE setting is not possible when using barcode or RFID readers!
DESTINATION BLOCK 000/00	Enter the number of the application block and of the subsequent block with which the barcode or RFID entry is to be described. When a target block is selected, barcode or RFID information can be read directly into this block without having to press a key beforehand, see page 27.
AUTOMATIC ENTRY	If AUTOMATIC ENTRY ON is selected, the received barcode or RFID code is shown in the display and is then accepted as the entry automatically. The display duration can be set in the TERMINAL master mode block, see page 41.
DISPLAY DATA	Only for RFID
UNTIL TIMEOUT	The read-in data are displayed for the duration of the set display duration.
UNTIL KEYPRESS	The read-in data are displayed until a key is pressed.

5.6.3   Setting AlibiMemory

ALIBI MEMORY	Configure contents of the entries of the alibi memory
ENTRY LENGTH	Use ↓↑ to select from various entries, the contents are shown in the display.
15 CHARACTERS	Gross, tare, date/time, scale number, MinWeigh, tare source; 15 characters Factory setting
35 CHARACTERS	Same as 1, additionally ID code A (20 characters)
45 CHARACTERS	Same as 1, additionally ID code A (30 characters)
55 CHARACTERS	Same as 1, additionally ID code A (20 characters) + ID code B (20 characters)
55 CHARACTERS	Same as 1, additionally ID code A (20 characters) + ID code C (20 characters)
55 CHARACTERS	Same as 1, additionally ID code A (20 characters) + ID code D (20 characters)
55 CHARACTERS	Same as 1, additionally ID code A (20 characters) + ID code E (20 characters)
55 CHARACTERS	Same as 1, additionally ID code A (20 characters) + ID code F (20 characters)
Note	If an alibi memory had already been initialised and the format is changed, all previous entries (in the old format) are deleted. For safety, a corresponding notice appears before initialisation.

5.6.4   Configure inputs/outputs

4 I/O / RELAY BOX 8 / ARM100	
INPUT	Operate inputs internally or externally.

INTERNALLY	Factory setting. Additional settings:
	CONFIGURE INPUTS Select the desired setting for every input.
	                      Factory setting for IND690-Base:
	
	                      Input 1 not in use
	                      Input 2 zero setting
	                      Input 3 taring
	                      Input 4 entry (ENTER key)
	                      Input 5 … 8 not in use
	                      Possible settings: see page 127
	Additional settings, only for 4 I/O:
	ON/OFF HIGH ACTIVE Factory setting, the weighing terminal is switched off when ON/OFF = 1. After the digital input has been activated, the display goes out, and the content of the text read-only memory 021, factory setting appears in the upper left corner: POWER OFF.
	ON/OFF LOW ACTIVE The weighing terminal is switched off when ON/OFF = 0.
	ON TIME Delayed switch-on: After the On signal has been activated, the weighing terminal still remains switched off for the configured period.
	                      Possible settings: 0 to 9 seconds
	Off TIME Delayed switch-off: After the Off signal has been activated, the weighing terminal still remains switched on for the configured period.
	                      Possible settings: 0 … 9 seconds
	Note: The input ON/OFF has priority over the keyboard, i.e. the weighing terminal can only be switched on again in the POWER OFF state via the ON/OFF input! In addition, entry into the master mode is permitted via the F6 key to be able to correct incorrect settings.

EXTERNALLY	Inputs are independent of the weighing functions. Read status of the inputs with the AR707 command, see page 121.

4 I/O / RELAY BOX 8 / ARM100	
OUTPUT	Operate outputs internally or externally.

INTERNALLY	Factory setting. Additional settings:
	CONFIGURE OUTPUTS Select the desired setting for every output.
	                         Factory setting for IDN690-Base:
	                         Output 1 Delta low
	                         Output 2 Delta ok
	                         Output 3 Delta high
	                         Output 4 Stable
	                         Output 5 Setpoint 1
	                         Output 6 Setpoint 2
	                         Output 7 Setpoint 3
	                         Output 8 Setpoint 4
	                         Possible settings: see page 127
	SETPOINT MODE With SETPOINT MODE ON 8 configurable fixed or dynamic set points are available, see page 67.
	                         To this purpose a setpoint has to be assigned to at least one output.

EXTERNALLY	Outputs are independent of the weighing functions. Set the outputs via the AW706… command, see page 120.
I/O TEST	Testing of the function and state of the inputs and outputs of one or two connected 8-690 relay box(es) If an input or output is set (high), the display indicates its number. If an input or output is not set (low), the display indicates –. **Set outputs** Switch over the outputs with the keys 1 to 8 of the numerical keypad. **Set inputs** Set inputs, e.g. by connecting a supply voltage (+24 V). **Two 8-ID7 relay boxes** Switch back and forth between the two 8-690 relay boxes with key 9 of the numerical keypad. **Exit I/O TEST** Exit the I/O test and the master mode with the 0 key of the numerical keypad.
Comments	• During the I/O tests only the keys (→0←), (→T←) and ↵ are active. • Serial interfaces can be used during the I/O test. • The possible functions for the inputs and outputs are listed in the Appendix, see Section 10.4.

SETPOINT MODE ON – defining set points
After SETPOINT MODE ON is selected, the following input mask appears for the setpoints 1 … 4 (Example):

SP1:	F↑	AO12	W1	1.2345 KG
SP2:	F↓	AO13	W2	0.5678 KG
SP3:	D↑	AO12	ALL	
SP4:	D↓	AO11	ALL	

4 parameters can be set for each set point:

a) Type of set point
F↑   fixed set point, ascending
F↓   fixed set point, descending
D↑   dynamic set point, ascending
D↓   dynamic set point, descending

Fixed set point	Set point value is specified in the master mode and cannot be changed in the weighing mode.
Dynamic set point	Set point value is specified in the weighing mode, see page 20.
Ascending	Digital output is set when the value of the application block concerned is greater than or equal to the set point value.
Decending	Digital output is set when the value of the application block concerned is less than or equal to the set point value.

b) Application block
Weight value to which the set point refers. All application blocks with a valid weight unit (kg, g, lb, oz, ozt, dwt, pc) are possible.
Factory setting: Application block 012, net weight

c) Scale
W1 … W4 or ALL for all scales

d) Set point value
With dynamic set points the weight value is entered in the normal mode, see page 20.

Configuring switching points 5 – 8
➜   With F4 >>, change to the input mask for switching points 5 – 8.
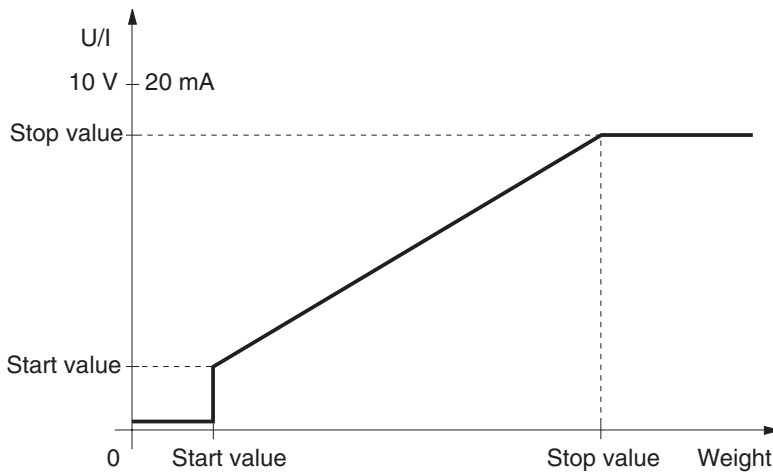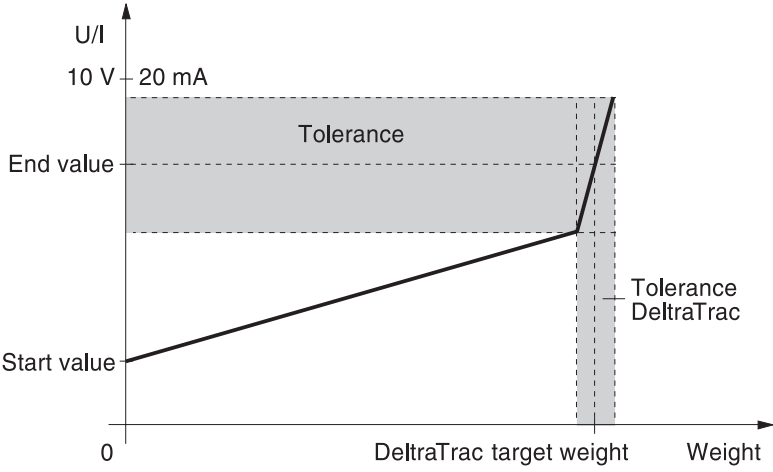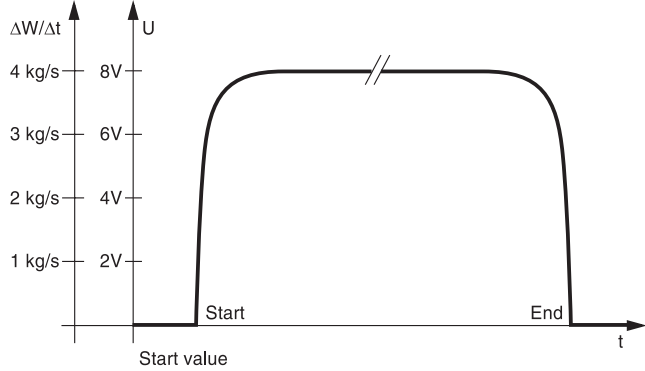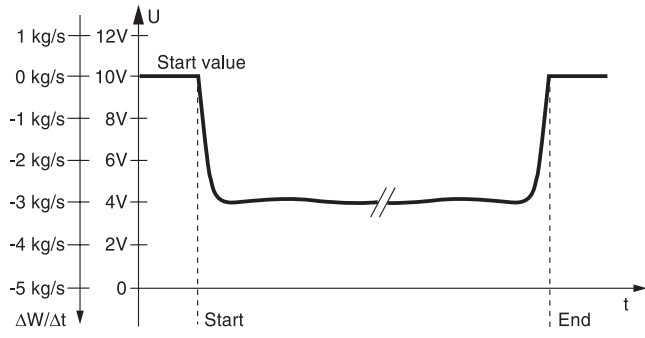
5.6.5   Configuring external keyboard

KEYBOARD PS2	Select keyboard layout of connected external keyboard
	Possible setting: English-USA, English-UK, German, French, Dutch, Italian, Spanish, Finnish, Russian

5.6.6   Configuring AnalogOut-690
The functionality of AnalogOut-690 is dependent on the version of your weighing terminal.

ANALOG OUTPUT	
SCALE	Select weighing platform from which the weight values are to be output at the interface AnalogOut-690. This block only appears when several weighing platforms are connected. Factory setting: All weighing platforms
ALL SCALES	Weight values can be output by all connected weighing platforms at the AnalogOut-690 interface. The assignment of a weighing platform to the AnalogOut-690 interface can be changed with or the command AW010...
SCALE 1 … SCALE 4	Only weight signals of the selected weighing platform can be output via the AnalogOut-690 interface
START-STOP MODE	When the selected weight value or the selected number of pieces is within the specified en start and stop values, a current/voltage signal in the specified range will be output at the AnalogOut-690 interface. For additional settings, see page 70.

ANALOG OUTPUT	
DELTATRAC MODE	In this operating mode the net weight value on the AnalogOut-690 interface is output in the factory setting, provided DeltaTrac is active. If no DeltaTrac target value is entered, 0 V / 0 mA are output. For additional settings, see page 70.
ΔW-ΔT MODE	In this operating mode flows are measured via the weight change per time in the supply or catch container. **Example 1:** Weighing in with a flow rate of 4 kg/sec. **Example 2:** Subtractive weighing with a flow rate of 3 kg/sec. starting value of the analog voltage signal: 10 V. In both cases a change in the flow rate of 1 kg/sec. results in a change in the analog voltage signal of 2 V. For additional settings, see page 71.

ANALOG OUTPUT	
DIRECTION	Configure the behaviour of the analog output.
ALL	The analog signal is sent irrespective of the preceding sign.
POSITIVE	The analog signal is only output at positive weight values. In the case of an underload or negative weight values the signal remains at "0" or the start value.
NEGATIVE	The analog signal is only output at negative weight values. In the case of positive weight values the signal remains at "0" or the start value. This setting is ideal for subtractive weighing from a container.

Parameter for Start-Stop mode

AB   Application block number for the weight value to be output at the AnalogOut-690 interface.
                       Factory setting: Application block 012, net weight

VALUE   Starting value of the analog output signal
                       Factory setting: 0 V
                       Possible settings: 0 V – 10 V or 0 mA – 20 mA
               Stop value of the analog output signal
                       Factory setting: 10 V
                       Possible settings: 0 V – 10 V or 0 mA – 20 mA

WEIGHT   Weight value at which the analog output is to start.
                       Factory setting: 0 g or 0 kg
               Weight value from which the maximum value of the analog signal is to be output.
                       Factory setting: Maximum load of weighing platform

Parameter for DeltaTrac mode

AB   Application block number for the weight value to be output at the AnalogOut-690 interface.
                       Factory setting: Application block 012, net weight

V/mA AT ZERO   Starting value of the analog output signal
                       Factory setting: 0 V
                       Possible settings: 0 V – 10 V or 0 mA – 20 mA

V/mA AT TARGET   Stop value of the analog output signal
                       Factory setting: 10 V
                       Possible settings: 0 V – 10 V or 0 mA – 20 mA

TOLERANCE   +/– deviation from stop value of analog signal when the target weight tolerance is reached
                       Factory setting: Tolerance = 0 V

Parameters for the ∆W-∆T MODE

AB	Application block number for the weight value to be output at the AnalogOut-690 interface.
	Factory setting: Application block 012, net weight
∆W-∆T	Value for the change in the analog output signal in the case of a weight change of one unit per second.
START VALUE	Starting value of the analog output signal
	Factory setting: 0 V
	Possible settings: 0 V – 10 V or 0 mA – 20 mA

5.6.7 Configuring Ethernet-690

The weighing terminal can only be operated on a network with a valid IP address, subnet mask and gateway address (if the weighing terminal is to route connections to another partial network). Ask your system administrator for these addresses.

ETHERNET	Configuring Ethernet-690
COMMUNICATION	For adaptation of the communication parameters between weighing terminal and the Ethernet module, see page 55.
MODE	For adaptation of the communication mode, see page 55.
IP ADDRESS	IP address entry
SUBNET MASK	Net mask entry
GATEWAY	Gateway address entry

Note

Additional information on the configuration of the Ethernet-690 network card and information on troubleshooting can be downloaded from the website of the manufacturer: www.WuT.de.

Checking Ethernet-690

Condition

You require a PC with Windows on which the protocol TCP/IP is installed. The PC must be operated in the same network segment as the weighing terminal with Ethernet-690.

Conducting test

With DOS entry window
1. Open DOS entry window.

2. Enter **TELNET xxx.xxx.xxx.xxx 8000** (xxx.xxx.xxx.xxx = IP address) and confirm with ↵.

   The PC reports the following in a Telnet window
   ```
   ************************
   *  Com-Server Highspeed  *
   ************************
   ```
   The message means that the Ethernet-690 network card is operable. The PC and the weighing terminal can communicate with each other via interface commands, see chapter 6.

3. Close Telnet window.

With browser
1. Start browser, e.g. Internet Explorer.

2. Enter **xxx.xxx.xxx.xxx** (xxx.xxx.xxx.xxx = IP address) and confirm with ↵.

   The PC reports a login window.

3. Enter password (factory setting: no password).
   The configuration menu of the Ethernet-690 network card appears.

5.6.8 Configuring ProfibusDP-690

PROFIBUS-DP	Configuring ProfibusDP-690
NODE ADDRESS	Select desired node address in range 001 to 126. Factory setting: 3
OPERATING MODE	Set type and word length of user data parameter VALUE.
	Consistent over valid module pair in GSD file
16-BIT-INTEGER / 2 WORDS	2 words 16-BIT-INTEGER 2(+2)W AI 16-BIT-INTEGER 2(+2)W AO
16-BIT-INTEGER / 4 WORDS	2 words 16-BIT-INTEGER 2(+2)W AI (use 2x) 16-BIT-INTEGER 2(+2)W AO (use 2x)
32-BIT-FLOATING- POINT	4 words 32-BIT-FLOATING-POINT 4W AI 32-BIT-FLOATING-POINT 4W AO
S/P MODE	Set type and use of setpoint.
UNIVERSAL	Each setpoint can be set and read independently of others.
CHECKWEIGHING	As soon as setpoints 1 and 2 are set, DeltaTrac CHECKWEIGHING will be activated with SP1 = setpoint and SP2 = tolerance (in %, in 16-bit integer mode with 2 decimal places). In read table current state BELOW (SP1), GOOD (SP2) or ABOVE (SP3) can be read off.

PROFIBUS-DP	Configuring ProfibusDP-690
FILLING	As soon as setpoints 1 and 2 are set, DeltaTrac CHECKWEIGHING will be activated with SP1 = setpoint and SP2 = tolerance (in %, in 16-bit integer mode with 2 decimal places). In addition, SP3 and SP4 can also be loaded as any desired setpoints. In read table current state GOOD (SP1), ABOVE (SP2), SP3 REACHED (SP3) or SP4 REACHED (SP4) can be read off.
I/P MODE	Set request for identification data in Input mode. After setting the user data command INPUT MODE in the write table, the selected request for input is automatically carried out and the entries are saved in the application blocks 094 to 099. The user data response INPUT MODE RUNNING remains set while the input mode is active.
A	Code A is requested.
A+B	Code B and Code A are always requested.
A+B+C	Code C, Code B and Code A are always requested.
A+B+C+D	Code D, Code C, Code B and Code A are always requested.
A+B+C+D+E	Code E, Code D, Code C, Code B and Code A are always requested.
A+B+C+D+E+F	Code F, Code E, Code D, Code C, Code B and Code A are always requested.
BYTE ORDER	Order of the bytes within a data word
NORMAL	Usual byte order (factory setting)
SWAPPED	The upper and lower byte of each data word are swapped
SIGN	Location of the sign in the 16-bit integer values Is only displayed if MODE = 16-BIT-INTEGER/x WORDS has been selected
SEPARATE BIT 16	The sign is transferred separately in Bit 16 (factory setting)
	Examples +2 0002 **0**000 0000 0000 0010 +1 0001 **0**000 0000 0000 0001 −1 8001 **1**000 0000 0000 0010 −2 8002 **1**000 0000 0000 0010
INTEGRATED IN INTEGER	The sign is transferred integrated in the integer
	Examples +2 0002 0000 0000 0000 0010 +1 0001 0000 0000 0000 0001 −1 FFFF 1111 1111 1111 1111 −2 FFFE 1111 1111 1111 1110

PROFIBUS-DP	Configuring ProfibusDP-690
EXP. AB AREA	Input of up to three expanded application blocks for constants which can be accessed when writing applications blocks. **Example** **Input enables access to** 021 application blocks 021_001 to 021_999 046 application blocks 046_001 to 046_999 071 application blocks 071_001 to 071_999
CONFIGURE INPUTS	Select the desired setting for every input. Factory setting for the IND690-Base: Input 1 not in use Input 2 zero setting Input 3 taring Input 4 entry (↵ key) Input 5 … 8 not in use Further settings: see page 129
CONFIGURE OUTPUTS	Select the desired setting for every output. Factory setting for the IND690-Base: Output 1 Delta low Output 2 Delta ok Output 3 Delta high Output 4 Stable Output 5 … 8 Setpoint 1 … 4 Further settings: see page 129
| TEST MODE | Activation of the information display. In line 3 and 4 write and read tables are displayed as follows:<br><br>```
        3   4              5     6

         TEST MODE                   0.999 kg
         Id   Val    5432109876543210   I/Os
 2 ──── 00   0000   0000000010000000   00   00
 1 ──── 00   03E7   0100000000000000   08   00
                    CANCEL
```<br><br>**1** Read table<br>**2** Write table<br>**3** Operating mode (internal)<br>**4** Value (hexadecimal)<br>**5** Command/response bits<br>**6** Inputs/outputs (hexadecimal) |

5.6.9 Configuring WLAN-690

The weighing terminal can only be operated in a wireless network with a valid IP address, subnet mask etc. Ask your system administrator for these parameters.

WLAN	Configuring WLAN-690
INFO	Displays the type and software version of the WLAN module. Same function as the key sequence "INFO 50" in the operating mode.
STATUS	Displays the current status of the WLAN module: Radio channel used, data rate of connection, transmission and reception quality, MAC address of the currently connected access point. Same function as the key sequence "INFO 51" in the operating mode.
COMMUNICATION	For adaptation of the communication parameters between weighing terminal and the WLAN module, see page 55.
MODE	For adaptation of the communication mode, see page 55.
IP ADDRESS	IP address entry
PORT NUMBER	Port number entry
GATEWAY	Gateway address entry
SUBNET MASK	Net mask entry
SSID	Entry of wireless-network name (ServiceSetIdentifier).
WEP-KEY	WEP key entry, with 5 characters (64 bit key) or 13 characters (128 bit key).
WPA-PSK	WPA-PSK key entry, with 16 characters (128 bit key). Note: It may take up to 50 seconds to proceed the key.
AUTHORIZATION	Activating/deactivating the authorization in accordance with the setting at the AccessPoint. If the authorization is activated at the AccessPoint, the authorization also has to be activated at the IND690.
PORT TYPE	Set WLAN architecture: Ad hoc or infrastructure
AUTO CONNECT	Input of the IP address and port number of a partner to which establishing of a connection is tried cyclically – if a connection does not exist.
Comment	SSID, WEP-key and WPA_PSK-key can be entered in different ways: ASCII characters direct entry Hexadecimal code start entry with IDENT E Decimal code start entry with IDENT F

5.6.10 Configuring Bluetooth-690/BT-BLD Display/BT-P42/BT-SICS

BLUETOOTH/BT-BLD/ BT-P42/BT-SICS	Configure Bluetooth-690/BT-BLD Display/BT-P42/BT-SICS
INFO	Displays the type, software version and manufacturer of the Bluetooth module. Same function as the key sequence "INFO 60" in the operating mode.
STATUS	Displays the current status of the Bluetooth module: own Bluetooth address, own Bluetooth name, user service/COM port and name of the Bluetooth module to which there is currently a connection. Same function as the key sequence "INFO 61" in the operating mode.
MODE	Adaptation of the communication mode, see Page 55.
PASSKEY	Switching the passkey interrogation on/off and entering the passkey, if switched on. Enter the passkey "Mettler-Toledo" at the BT-BLD display and the BT-P42. All the communication parameters are then set automatically for the connected device
CONNECT	All reachable Bluetooth modules are displayed. The connection to one of these modules can then be made or an existing connection can be broken.
Comment	Passkey can be entered in different ways: ASCII characters direct entry Hexadecimal code start entry with IDENT E Decimal code start entry with IDENT F

6 Interface description

6.1 General

To exchange data with a computer, the weighing terminal is equipped with an RS232 interface. Up to 8 additional interfaces are available as an option.

The interfaces operate independently of each other, can be used simultaneously and can be adjusted individually, see section 5.6.

To operate the serial interfaces in the **dialog mode**, one of the following METTLER TOLEDO command sets must be selected in the master mode:

- MMR command set, see section 6.2.

- METTLER TOLEDO Continuous mode, see section 6.3.

- METTLER TOLEDO SICS command set, see section 6.4.

Note

In order to avoid data loss, do not operate the interfaces in unsolicited mode. In particular if the handshake is deactivated, ensure that the host waits for a response after every command before a new command is sent.

6.2 MMR command set

6.2.1 Syntax and formats of communication

Commands and responses for transmitting weights have the following formats:

Command format when transmitting weight formats

Identification	_	Weight value	_	Unit	Framing
Character sequence for specification of command (1 … 4 characters)		1 … 8 digits, number of digits variable		1 … 3 characters, number of characters variable	Definable in master mode, factory setting: C$_R$L$_F$

Response format when transmitting weight formats

Identification	_	Weight value	_	Unit	Framing
Character sequence for specification of response (2 … 3 characters)		10 digits, right-justified, filled out with blank spaces		3 characters, left-justified, filled out with blank spaces	definable in master mode, factory setting: C$_R$L$_F$

Example

Command Tare specification   `T _ 1 3 . 2 9 5 _ k g`

Response Tare specification   `T B H _ _ _ _ _ _ 1 3 . 2 9 5 _ k g _`

Data formats

- The following symbols are used in the following command description:

  $\overline{\text{Weight value}}$ 10 characters with sign and decimal point, right-justified (with preceding blank spaces)

  $\overline{\text{Unit}}$ 3 characters, left-justified (with following blank spaces)

  $\overline{\text{Text\_n}}$ maximum of n characters, left-justified

- The string framing is mandatory, however it is **not** contained in the following command description!

- Enter commands as ASCII characters. The following ASCII characters are available: 20 hex/32 deci … 7F hex/127 deci, see page 126.

BUS SLAVE operating mode (RS485)

In the BUS SLAVE operating mode each command and each response begins with a code for the terminal address.

Terminal address 1 … 9   Code "1" … "9"   (31H … 39H)

Terminal address 10 … 31   Code "a" … "v"   (61H … 76H)

Example

Command to terminal 3:   `3 S`

Response from terminal 3: `3 S _ _ _ _ _ _ 1 2 . 7 6 5 _ k g _`

6.2.2   Command overview

Command	Meaning	Page
R0 / R1	Switch keypad on/off	80
KD / KE	Switch individual key on/off	80
Z	Set weight display to zero after weighing platform stabilization	80
U_…	Change over terminal to a different weight unit	80
T	Tare	81
T_…	Specify tare weight	81
DY_…	Specify DeltaTrac target value	82
S	Transmit in case of weighing platform stabilization	82
SI	Transmit independent of weighing platform stabilization	82
SIR	Transmit repeatedly independent of weighing platform stabilization	83
SR	Transmit stabilized weight values repeatedly depending on a weight change	83
SR_…	Transmit repeatedly depending on weighing platform stabilization with specification of an excursion value	83
SX	Transmit data record after weighing platform stabilization	84
SXI	Transmit data record independent of weighing platform stabilization	84
SXIR	Transmit data record repeatedly independent of weighing platform stabilization	84
ARNo.	Read information of application block	85
AWNo._…	Write to application block	85
D_…	Write to display	85
P_…	Print alphanumeric characters or barcodes on the GA46	86
DS	Trigger acoustic signal	86
ID	Interrogate terminal identification	86
W_…	Actuating digital outputs	87

6.2.3 Command description

Switch keypad on or off

Command	R␣0	Switch on keypad
	R␣1	Switch off keypad
Response	R␣B	Keypad switched on or off
Comments	• Factory setting: Keypad switched on.	
	• When the keypad is switched off, the terminal cannot be operated manually.	

Switch individual key on or off

Command	K␣E␣_␣x␣x	Switch on key with key number xx
	K␣D␣_␣x␣x	Switch off key with key number xx
Response	K␣B	Key switched on or off
Comments	• Factory setting: Keys switched on.	
	• See table in the Appendix for key numbers.	

Set zero

Command	Z	Set gross weight display to zero after weighing platform stabilization, effect as when →0← is pressed.
Response	Z␣B	Weighing platform set to zero
	Z␣-	Command cannot be executed: Zero-set range dropped below
	Z␣+	Command cannot be executed: Zero-set range exceeded
Comments	• Setting to zero is not possible when the weighing platform stabilizes in the zero-set range.	
	• With some weighing platform types setting to zero deletes a saved tare weight. This is indicated with the message TA, see section 6.2.4.	

Changing over to different weight unit

Command	U␣_␣Unit	Change over weight display to different weight unit
	U	Change over weight display to first weight unit
Response	U␣B	Weight display changed over to different weight unit
Comment	Possible units: g, kg, lb, ozt, oz, dwt	

Tare

Command	$\boxed{\text{T}}$	Tare weighing platform:
		After the weighing platform stabilizes, the current weight value is saved as the tare weight and the weight display is set to zero with the weight placed on the platform.
		Effect as when $\overset{\rightarrow T \leftarrow}{\bigcirc}$ is pressed.
	$\boxed{\text{T}}\ \boxed{\_}\ \boxed{\text{Tare weight (weight value)}}\ \boxed{\_}\ \boxed{\text{Unit}}$	
		Specify tare weight:
		The content of the tare memory is overwritten with the specified tare weight and the net weight is displayed.
		Effect as when $\boxed{\text{PT}}$, 0 … 9, ↵ sequence is pressed.
	$\boxed{\text{T}\,\_}$	Delete tare weight.
Response	$\boxed{\text{T}\,\text{B}\,\_}\ \boxed{\_}\ \boxed{\text{Tare weight (weight value)}}\ \boxed{\_}\ \boxed{\text{Unit}}$ Weighing platform is tared
	$\boxed{\text{T}\,\text{B}\,\text{H}}\ \boxed{\_}\ \boxed{\text{Tare weight (weight value)}}\ \boxed{\_}\ \boxed{\text{Unit}}$ Weighing platform is tared with specified weight
	$\boxed{\text{T}\,\text{-}}$ Command cannot be executed: Tare range dropped below
	$\boxed{\text{T}\,\text{+}}$ Command cannot be executed: Tare range exceeded
Comments	• Taring is only possible when the weighing platform stabilizes within the tare range.
	• The tare weight is always transmitted in the first weight unit.
	• Each taring command overwrites the content of the tare memory with the new tare weight.
	• Taring with an unloaded weighing platform deletes the tare memory. On some weighing platform types a zero set is carried out in the unloaded state. This is displayed with the message ZA, see section 6.2.4.
	• On not certified weighing systems the tare weight is automatically rounded to the current increment.
	• On certified weighing systems: Tare range for MultiRange only in first increment range.
Example	Command: $\boxed{\text{T}}$
	Response: $\boxed{\text{T}\,\text{B}\,\_}\ \boxed{\_}\ \boxed{\_\,\_\,\_\,\_\,1\,2\,.\,6\,5\,0}\ \boxed{\_}\ \boxed{\text{k}\,\text{g}\,\_}$

Specify DeltaTrac target value

Command	`D͵Y` `_` `Target weight (weight value)` `_` `Unit` `_` `Lower tolerance` `_` `Unit` `_`
	`Upper tolerance` `_` `Unit`
	Specify DeltaTrac target value
	`D͵Y` Delete DeltaTrac target value

Response	`D͵B` DeltaTrac target value loaded/deleted
Comments	• Observe limit values, see page 18 • Also possible: `A͵W͵0͵2͵0͵...`, see page 116
Example	Command: `D͵Y` `_` `4͵.͵5` `_` `k͵g` `_` `5` `_` `%` `_` `4` `_` `%` Response: `D͵B`

Transmit content of display

Command	`S` Transmit a stabilized weight when weighing platform is stabilized. `S͵I` Transmit a stabilized or dynamic weight independent of weighing platform stabilization.
Response	`S͵_` `_` `Weight value` `_` `Unit` Stabilized weight value transmitted `S͵D` `_` `Weight value` `_` `Unit` Dynamic weight value transmitted `S͵I` Invalid weight `S͵I͵-` Weighing platform in underload range `S͵I͵+` Weighing platform in overload range

Transmit content of display repeatedly

Command	`S̩I̩R` Transmit stabilized or dynamic weight values after each measuring cycle independent of weighing platform stabilization. `S̩R` Transmit the next stabilized weight value after a weight change (e.g. different item) and one dynamic and the next stabilized weight value after each deflection > 30 d. `S̩R`␣`Deflection weight (weight value)`␣`Unit` Transmit the next stabilized weight value and, depending on the specified deflection, a dynamic weight value after a weight change greater than the specified deflection value.
Response	`S̩␣`␣`Weight value`␣`Unit` Transmit stabilized weight value repeatedly `S̩D`␣`Weight value`␣`Unit` Transmit dynamic weight value repeatedly
Comment	Stop command with `S`, `S̩I` command or by interrupting the interface

Example	Command: `S̩R`␣`1̩4̩0`␣`k̩g`
	Responses: `S̩␣`␣`␣␣␣␣2̩0̩0̩.̩0̩0`␣`k̩g` 1st item
	                `S̩D`␣`␣␣␣␣3̩4̩5̩.̩8̩5`␣`k̩g`
	                `S̩␣`␣`␣␣␣␣4̩1̩0̩.̩5̩0`␣`k̩g` 2nd item

Transmit data record

Command	$\boxed{S\,X}$	Transmit a data record with stabilized weight values after weighing platform stabilization. Effect as if ↵ is pressed.
	$\boxed{S\,X\,I}$	Transmit a data record with stabilized or dynamic weight values independent of weighing platform stabilization.
	$\boxed{S\,X\,I\,R}$	Transmit data records with stabilized or dynamic weight values repeatedly independent of weighing platform stabilization.
Response	$\boxed{S\,X}\_\_\boxed{\text{Application block}}\_\_\boxed{\text{Application block}}...\;]$ $\quad\quad\;\;\mid\quad\quad\quad\quad\mid$ $\quad\quad\boxed{A}\boxed{\text{No.}}\_\boxed{\text{Data record}}$ Data record with stabilized weight values transmitted $\boxed{S\,X\,D}\_\boxed{\text{Application block}}\_\_\boxed{\text{Application block}}...\;]$ $\quad\quad\;\;\mid\quad\quad\quad\quad\mid$ $\quad\quad\boxed{A}\boxed{\text{No.}}\_\boxed{\text{Data record}}$ Data record with dynamic weight values transmitted $\boxed{S\,X\,I}$ Invalid value $\boxed{S\,X\,I\,-}$ Weighing platform in underload range $\boxed{S\,X\,I\,+}$ Weighing platform in overload range		
Comments	• Number of application block: three-digit with leading zeros. • The content of the corresponding application block is contained in data record, see chapter 7. Standard data record consists of 3 blocks: $\boxed{S\,X}\_\_\boxed{A\,0\,1\,1}\_\boxed{\text{Gross weight (weight value)}}\_\boxed{\text{Unit}}\_\_$ $\boxed{A\,0\,1\,2}\_\boxed{\text{Net weight (weight value)}}\_\boxed{\text{Unit}}\_\_$ $\boxed{A\,0\,1\,3}\_\boxed{\text{Tare weight (weight value)}}\_\boxed{\text{Unit}}$ The continuous transmission of data records started with the $\boxed{S\,X\,I\,R}$ command can be stopped with the $\boxed{S\,X}$ or $\boxed{S\,X\,I}$ command.		
Example	Command: $\boxed{S\,X\,I}$ Response: Standard data record $\boxed{S\,X\,D}\boxed{A\,0\,1\,1}\_\_\_\_\_2\,3\,.\,6\,5\,0\_\boxed{k\,g\,}$ $\_\boxed{A\,0\,1\,2}\_\_\_\_\_2\,1\,.\,6\,5\,0\_\boxed{k\,g\,}$ $\_\boxed{A\,0\,1\,3}_____2\,.\,0\,0\,0\_\boxed{k\,g\,}$		

Read application block

Command	`A‚R‚No.`	Read content of application block
Response	`A‚B‚_‚Information`	Content of application block transmitted
Comments	• Transmitted information is dependent on application block, see chapter 7. • Number of application block must be entered as 3 digits with preceding zeros.	

Write to application block

Command	`A‚W‚No.‚_‚Information`
	`A‚W‚No.`
	`A‚W‚No.‚_`
		Write to application block
		Reset application block
		Delete application block

Response	`A‚B`	Written to application block
Comments	• Information to be entered is dependent on target block, see chapter 7. • Deleting and resetting have same effect.	

Write to display

Command	`D‚_‚Text_20`
	`D‚_`
	`D`
		Write to display
		Switch display to dark
		Set display to normal status

Response	`D‚B`	Written to display
Comments	• Character stock: ASCII characters 20 hex/32 deci … 7F hex/127 deci, see page 126. • Watch upper and lower case.	

Alphanumeric printout on GA46 printer

Command	`P` `_` `Text_48`	Print text as per setting
	`P` `_` `$` `!` `1` `Text_48`	Print text in small type
	`P` `_` `$` `!` `2` `Text_48`	Print text in normal type
	`P` `_` `$` `!` `3` `Text_48`	Print text in large type
	`P` `_` `$` `!` `A` `Text_48`	Print text in small type and bold print
	`P` `_` `$` `!` `B` `Text_48`	Print text in normal type and bold print
	`P` `_` `$` `!` `C` `Text_48`	Print text in large type and bold print
	`P` `_`	Print blank line
Response	`P` `B`	Alphanumeric characters printed
Comments	• Character stock: ASCII characters 20 hex/32 deci … 7F hex/127 deci, see page 126. • Text is printed in last selected type size. • Watch upper and lower case.	

Barcode printout on GA46 printer

Command	`P` `_` `$` `#` `1` `Text_20, barcode-specific`	Print Code 39
	`P` `_` `$` `#` `2` `Text_8, barcode-specific`	Print EAN 8
	`P` `_` `$` `#` `3` `Text_13, barcode-specific`	Print EAN 13
	`P` `_` `$` `#` `4` `Text_20, barcode-specific`	Print EAN 128
	`P` `_` `$` `#` `5` `Text_20, barcode-specific`	Print Code 2 of 5
	`P` `_` `$` `#` `6` `Text_20, barcode-specific`	Print Code 2 of 5 interleaved
	`P` `_` `$` `#` `7` `Text_20, barcode-specific`	Print Code 128
	`P` `_` `$` `#` `8` `Text_20, barcode-specific`	Print EAN 128
	`P` `_`	Print blank line
Response	`P` `B`	Barcode printed
Comments	• Character stock: ASCII characters 20 hex/32 deci … 7F hex/127 deci, see page 126. • With Code 39, 3 barcodes can be printed next to each other. Separating characters: $$ or H_T (ASCII character 09 hex/9 deci). Arrangement of barcodes: Barcode 2, Barcode 1, Barcode 3.	

Acoustic signal

Command	`D` `S`	Generate short acoustic signal (beep tone) in terminal
Response	`D` `B`	Acoustic signal generated in terminal

Identification

Command	`I` `D`	Interrogate identification of terminal
Response	`I` `D` `7` `_` `Program number of Pac`	

Actuating digital outputs

Command	`W` `_` `Status` Switch individual digital outputs on or off
	`W` `_` `Status 1` `_` `Time 1` `_` `Status 2` `_` `Time 2` `_` `...` `Status 4` `_` `Time 4` `_` `Status 5`
	Trigger time sequence of status changes of digital outputs
	`W` `,` `W` `_` Reset all outputs to logical 0
	Status: Each output is assigned a value. The total of the values of those outputs which are to be closed is indicated as the "Status".
	Digital output 1 1
	Digital output 2 2
	Digital output 3 4
	Digital output 4 8
	Digital output 5 16
	Digital output 6 32
	Digital output 7 64
	Digital output 8 128
	All outputs open 0
	All outputs closed 255
	Time: 1 ... 99999 ms
Response	`W` `B` Digital outputs set
Comments	• Max. 5 statuses "Status" and 4 intervals "Time" are possible. After sequence has been run, digital outputs freeze in last status "Status".
	• A break in the port has no effect on the outputs.
	• If terminal receives a new W command before time sequence has been run, ongoing sequence will be aborted immediately.
	• If limits for "Status" and "Time" are not adhered to, error message EL appears on 4 I/O-690 interface or 8-690 relay box.
Examples	Command: `W` `_` `5`
	Digital outputs 1 and 3 are closed, all others opened
	Command: `W` `_` `1` `_` `1,0,0,0` `_` `3,2` `_` `5,0,0,0` `_` `3,3` `_` `5,0,0` `_` `0`
	triggers following sequence:

6.2.4 Terminal messages – only with RS232, RS422, CL20mA and USB

In the dialog mode the weighing terminal transmits an acknowledgement to the computer each time a key is pressed.

When this pressing of a key is replaced with an interface command, the acknowledgement only differs in the second character in the response format which is part of the command:

Function	Key	Acknowledgement
Set zero		`Z‗A`
Tare		`T‗A` … (see command T)
Specify tare weight		`T‗A‗H` … (see command T_ …)
Change over unit		`U‗A‗_‗Unit`
Transmit data record in case of weighing platform stabilization		`S‗T‗_‗_` … (see command SX)
Switch over weighing platform		`S‗A‗_‗_‗n` n = weighing platform 1 … 3
Dynamic weighing		`A‗A‗0‗1‗6‗_‗Weight value‗_‗Unit`
Identification A … F	A … F	`K‗x‗_‗Identification` x = A, B, C, D, E, F 20 characters, right-justified
Function keys	F1 … F6	`K‗F‗_‗x` x = I, J, K, L, M, N

6.2.5 Fault messages

Fault messages always consist of 2 characters and a string frame.
The string frame can be defined in the master mode (section 5.6.2).

`E‗T` **Transmission error**
The terminal transmits a transmission error for errors in the received bit sequence, e.g. parity errors, missing stop bit.

`E‗S` **Syntax error**
The terminal transmits a syntax error when the received characters cannot be processed, e.g. command does not exist.

`E‗L` **Logic error**
The terminal transmits a logic error when a command cannot be executed, e.g. when an attempt is made to write to a write-protected application block.

6.3   METTLER TOLEDO continuous mode

These operating modes are suitable for continuous data transmission in real time from the weighing terminal to METTLER TOLEDO devices, e.g. to a second display.

The data are even transmitted when the weighing platform is moving or the gross weight = 0.

Commands can also be sent to the weighing terminal, permitting remote control of certain keys on the terminal.

There are 2 different continuous modes:

* Continuous mode – net and tare values are continuously transmitted.

* Short continuous mode – only net values are continuously transmitted.

6.3.1   Data output from IND690

Output format   Weight values are always transmitted in the following format:

STX	SB1	SB2	SB3	DF1	DF2	CR	CHK

STX   ASCII characters 02 hex/2 deci, character for "start of text"
            is required by some printers

SB...   For status bytes, see below

DF1   Data field with 6 digits for the weight value transmitted without a decimal point and unit
            When counting is active in the IND690-Count:
            6 digits for the quantity, no leading zeroes

DF2   Data field with 6 digits for the tare weight;
            is not transmitted in the short continuous mode
            When counting is active in the IND690-Count:
            6 zeroes, not transferred in Short Continuous mode

CR   Carriage return (ASCII character 0D hex/13 deci)

CHK   Checksum (2-part complement of binary sum of 7 lower bits of all previously transmitted characters, including STX and CR)

Status byte SB1

Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	1	Rounding / Increment		Decimal position		

Bit 4	Bit 3	Rounding/ Increment
0	1	1
1	0	2
1	1	5

Bit 2	Bit 1	Bit 0	Decimal position
0	0	0	XXXX00
0	0	1	XXXXX0
0	1	0	XXXXXX
0	1	1	XXXXX.X
1	0	0	XXXX.XX
1	0	1	XXX.XXX
1	1	0	XX.XXXX
1	1	1	X.XXXXX

Status byte SB2

Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	1	0 lb	0 Stabiliza-tion	0 Normal status	0 Positive sign	0 Gross value
		1 kg	1 Movement	1 Underload/ overload	1 Negative sign	1 Net value

Status byte SB3

Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	1	0	0 Basic state 1 Print request	Weight value		

Bit 2	Bit 1	Bit 0	Weight value
0	0	0	kg / lb (SB2 Bit 4)
0	0	1	g
0	1	0	t
0	1	1	oz
1	0	0	ozt
1	0	1	dwt
1	1	0	ton
1	1	1	free unit

6.3.2 Commands to IND690

Individual command characters can be transmitted to the IND690 in the text format. One function each on the terminal is assigned to these command characters.

After a command character is received, the following functions are executed:

Com-mand	Function	Note
C	Delete tare	for every application software
P	Print or send transfer string	
T	Taring	
Z	Setting to zero	
Tx.xxx	Specify tare value	
Sxxxx	Specify reference quantity	only for IND690-Count
Sx.xxx	Specify reference weight	
Ax.xxx	Specify reference piece weight	

6.4 METTLER TOLEDO SICS command set

6.4.1 Communication syntax and formats

Command format when transmitting weight values

Identification	_	Weight value	_	Unit	Framing
String of characters for specification of command (1 … 4 characters)		1 … 10 characters		1 … 3 characters, number of characters variable	$C_R L_F$

Response format when transmitting weight values

Identification	_	Status	_	Weight value	_	Unit	Framing
String of characters for specification of response (1 … 2 char.)		1 char.		10 char., right-justified, filled in with blank char.		3 char., left-justified, filled in with blank char.	$C_R L_F$

Example

Tare specification command `T A _ 1 3 . 2 9 5 _ k g`
Tare specification response `T A _ A _ _ _ _ _ 1 3 . 2 9 5 _ k g _`

Data formats

- The following symbols are used in the command description:

  `Weight value`   10 numbers with sign and decimal point, right-justified (with preceding blank spaces)

  `Unit`   3 characters, left-justified (with following blank spaces)

  `"Text_n"`   maximum of n characters, left-justified

- The string framing is mandatory, however it is **not** listed in the following command description!

- Enter commands as upper-case letters.

- Text to be entered must always be placed in quotation marks.

6.4.2 Command overview

Command	Meaning	Page
Level 0		
I0	Transmit list of all available SICS commands	93
I1	Transmit SICS level and SICS versions	93
I2	Transmit scale data (terminal, platform)	93
I3	Transmit scale software version (program number)	94
I4	Transmit serial number	94
S, SI, SIR	Transmit display contents	94
Z	Set to zero	95
ZI	Set to zero immediately	95
@	Reset	95
Level 1		
D	Write display	95
DW	Weight display	95
K	Keyboard monitoring	96
SR	Transmit stable weight values repeatedly depending on a weight change	97
T	Taring	97
TI	Tare immediately	98
TA	Specify tare weight	98
TAC	Delete tare weight	99
Level 2		
SX, SXI, SXIR	Transmit data record	99
R0, R1	Switch keyboard on or off	100
U	Change over to different weight unit	100
DS	Acoustic signal	100
Level 3		
AR	Read application block	100
AW	Write application block	101
DY	Specify DeltaTrack target value	101
P	Print text or barcode	102
W	Actuating digital outputs	103

6.4.3 Command description

Transmit SICS commands

Command	`I 0` Transmit SICS commands

Response	`I 0 _ B _ 0 _ "I0"`
	 `I 0 _ B _ 0 _ "I1"`
	 …
	 `I 0 _ B _ 1 _ "D"`
	 …
	 `I 0 _ B _ 2 _ "SX"`
	 …
	 `I 0 _ B _ 3 _ "AR"`
	 …

Transmit SICS levels and SICS versions

Command	`I 1` Transmit SICS levels and SICS versions
Response	`I 1 _ A _ "x1" _ "x2" _ "x3" _ "x4" _ "x5"` x1 = 0123 Scale with SICS levels 0, 1, 2 and 3 x2 Version or implemented SICS0 commands x3 Version or implemented SICS1 commands x4 Version or implemented SICS2 commands x5 Version or implemented SICS3 commands `I 1 _ I` Command understood, cannot be executed at this time
Comments	• On the SICS level only fully implemented levels are executed. • With the SICS version all levels are specified.

Transmit scale data

Command	`I 2` Transmit data from weighing terminal and weighing platform(s)
Response	`I 2 _ A _ "text"`
Example	`I 2 _ A _ "IND690-Count IZ05 15.000 kg IZ10 32.000 kg"`

Transmit scale software version

Command	`I 3`	Transmit software version from weighing terminal and weighing platform(s)
Response	`I 3` _ `A` _ `"text"`	
Example	`I 3` _ `A` _ `"IP63-0-0100I IZ05-0-0301 IZ10-0-0221"`	

Transmit serial number

Command	`I 4`	Transmit serial number of weighing terminal
Response	`I 4` _ `A` _ `"text"`	
Example	`I 4` _ `A` _ `"1234567"`	
Comment	The response to I4 appears automatically following switch-on and after the Reset command (@).	

Transmit display contents

Command	`S`	Transmit a stable weight value when the weighing platform is at a standstill.
	`S I`	Transmit a stable or a dynamic weight value, regardless of whether the weighing platform is at a standstill.
	`S I R`	Transmit a stable or a dynamic weight value after each measuring cycle, regardless of whether the weighing platform is at a standstill.
Response	`S` _ `S` _ `Weight value` _ `Unit` Stable weight value transmitted	
	`S` _ `D` _ `Weight value` _ `Unit` Dynamic weight value transmitted	
	`S` _ `I` Invalid value	
	`S` _ `-` Weighing platform in underload range	
	`S` _ `+` Weighing platform in overload range	
Comment	Stop `S I R` command with `S`, `S I`, `S R`, @ command or disconnect port.	

Set to zero

Command	`Z`	Set gross weight display to zero after weighing platform comes to a standstill, effect as when 〈→0←〉 is pressed
	`Z`|`I`	Set the gross weight display immediately to zero independently of a standstill
Response	`Z`|_|`A`	Weighing platform set to zero
	`Z`|_|`I`	Command cannot be executed: e.g. standstill not achieved or another command is currently being executed
	`Z`|_|`-`	Command cannot be executed: Zero-set range dropped below
	`Z`|_|`+`	Command cannot be executed: Zero-set range exceeded

Reset

Command	`@`	Reset weighing terminal to the state maintained after Power On
Response	`I`‚`4`|_|`A`|_|`"text"`	Serial number
Comments	• All running applications and functions are cancelled.
	• The tare memory is reset to zero.

Write display

Command	`D`|_|`"Text_20"`	Write display
	`D`|_|`""`	Darken display
Response	`D`|_|`A`	Display written; the complete text appears left-justified in the display, marked with a symbol, e.g. with *
	`D`|_|`A`	Display written; the end of the text appears left-justified in the display with the beginning cut off, marked with a symbol, e.g. with *
	`D`|_|`I`	Command cannot be executed
	`D`|_|`L`	Command understood, parameters defective
Comment	A symbol in the display, e.g. *, indicates that an invalid weight value is displayed.

Weight display

Command	`D`‚`W`	Switch over main display into the weight mode
Response	`D`‚`W`|_|`A`	The main display shows the current weight value
	`D`‚`W`|_|`I`	Command understood, but cannot be executed

Keyboard monitoring

Command	$\boxed{K \_ 1}$	When a key is pressed, execute the function, but do not transmit anything (factory setting)
	$\boxed{K \_ 1}$	When a key is pressed, do not execute the function and do not transmit anything
	$\boxed{K \_ 3}$	When a key is pressed, do not execute the function, but transmit the key code $\boxed{K \_ C \_ x}$ or, when the key is pressed longer, transmit $\boxed{K \_ R \_ x}$ and $\boxed{K \_ C \_ x}$
	$\boxed{K \_ 4}$	When a key is pressed, execute the function and transmit the function code $\boxed{K \_ A \_ x}$
		If the function cannot be executed immediately, the function code for the start of the function $\boxed{K \_ B \_ x}$ or $\boxed{K \_ A \_ x}$ for the end of the function is transmitted.
Response	$\boxed{K \_ A}$	Command understood or function successfully executed
	$\boxed{K \_ I}$	Command understood, but currently cannot be executed, e.g. no keyboard present
	$\boxed{K \_ L}$	Command understood, parameters defective
	Key codes	
	$\boxed{K \_ R \_ x}$	Key x was pressed briefly and released again immediately
	$\boxed{K \_ C \_ x}$	Key x was pressed for approx. 2 sec.
	See table in the Appendix for key codes	
Comments	• The factory setting is active after switch-on, after the Reset command and after exiting the master mode.	
	• Only one K command is ever active at one time.	

Transmit stable weight values repeatedly depending on a weight change

Command	`S R _` `Excursion weight (weight value)` `_` `Unit`
	After a weight change greater than the specified excursion weight, transmit alternately the next stable weight value and a dynamic weight value depending on the specified excursion.
	`S R` If no excursion weight is entered, the weight change must be at least 12.5 % of the last stable weight value, however at least 30 d.
Response	`S _ S _` `Weight value` `_` `Unit` Current stable weight value transmitted
	Weight change
	`S _ D _` `Weight value` `_` `Unit` Dynamic weight value transmitted
	`S _ I` Command cannot be executed
	`S _ L` Command understood, parameters defective
	`S _ -` Weighing platform in underload range
	`S _ +` Weighing platform in overload range
Comment	Stop command with command `S`, `S I`, `S I R`, @ or disconnect the port.
Example	Command: `S R _ 1 4 0 _ k g`
	Responses: `S _ S _ _ _ _ _ 2 0 0 . 0 0 _ k g` 1st item
	`S _ D _ _ _ _ _ 3 4 5 . 8 5 _ k g`
	`S _ S _ _ _ _ _ 4 1 0 . 5 0 _ k g` 2nd item

Taring

Command	`T` Tare weighing platform:
	After the weighing platform comes to a standstill, the current weight value is saved as a tare weight and the weight display set to zero with the weight on the platform.
	Effect as when TARE key is pressed.
Response	`T _ S _` `Tare weight (weight value)` `_` `Unit` Weighing platform tared, stable tare value
	`T _ I` Taring not carried out
	`T _ -` Command cannot be executed: Tare range dropped below
	`T _ +` Command cannot be executed: Tare range exceeded
Comments	• Each taring command overwrites the contents of the tare memory with the new tare weight.
	• Taring with unloaded weighing platform clears the tare memory. On some weighing platform models, setting to zero is carried out in the unloaded state.
	• On non-certified weighing systems the tare weight is automatically rounded off to the current increment.
	• On certified weighing systems: Tare range with MultiRange only in first increment range.

Tare immediately

Command	`T‚I`	Tare weighing platform immediately.
Response	`T‚I`_`S`_`Tare weight (weight value)`_`Unit`	Weighing platform tared, stable tare value
	`T‚I`_`D`_`Tare weight (weight value)`_`Unit`	Weighing platform tared, dynamic tare value
	`T‚I`_`I`	Taring not carried out
	`T‚I`_`L`	Command cannot be executed
	`T‚I`_`-`	Command cannot be executed: Tare range dropped below
	`T‚I`_`+`	Command cannot be executed: Tare range exceeded
Comments	• Each taring command overwrites the contents of the tare memory with the new tare weight. • Following a dynamic tare value, a stable weight value can be specified. However, this value is not exact.	

Specify tare weight

Command	`T‚A`_`Tare weight (weight value)`_`Unit`	Specify tare weight: The contents of the tare memory are overwritten with the specified tare weight and the net weight is displayed. Effect as when the key sequence (PT), 0 ... 9, ↵ is pressed.
Response	`T‚A`_`A`_`Tare weight (weight value)`_`Unit`	Weighing platform tared with the specified value
	`T‚A`_`I`	Command not carried out
	`T‚A`_`L`	Command understood, parameters defective
	`T`_`-`	Command cannot be executed: Tare range dropped below
	`T`_`+`	Command cannot be executed: Tare range exceeded
Comments	• The contents of the tare memory are overwritten with the specified tare value. • On non-certified weighing systems the tare weight is automatically rounded off to the current increment. • On certified weighing systems: Tare range with MultiRange only in first increment range.	
Example	Command: `T‚A`_`1‚2‚.‚6‚5‚0`_`k‚g` Response: `T‚A`_`A`_`_‚_‚_‚_‚1‚2‚.‚6‚5‚0`_`k‚g‚`_	

Delete tare weight

Command	`T A C`	Delete tare weight.
Response	`T A C _ A` `T A C _ I`	Weighing platform tared with the specified weight Command not carried out

Transmit data record

Command	`S X`	After the weighing platform comes to a standstill, transmit a data record with stable weight values. Effect as when ↵ is pressed.
	`S X I`	Transmit a data record with stable or dynamic weight values, regardless of whether the weighing platform is at a standstill.
	`S X I R`	Repeatedly transmit a data record with stable or dynamic weight values, regardless of whether the weighing platform is at a standstill.

Response	`S X _ S _ │Application block│ _ _ │Application block│ ... │`
	  │ │
	  `│A│No.│_│Data record│`
	Data record with stable weight values transmitted
	
	`S X _ D _ │Application block│ _ _ │Application block│ ... │`
	  │ │
	  `│A│No.│_│Data record│`
	Data record with dynamic weight values transmitted
	
	`S X _ I` Command cannot be executed
	`S X _ -` Weighing platform in underload range
	`S X _ +` Weighing platform in overload range

Comments	• Number of application blocks: three-place with preceding zeros.
	• The contents of the corresponding application block is contained in the data record, see chapter 7. The standard data record consists of 3 blocks:
	`S X _ S _ A 0 1 1 _ │Gross weight (weight value)│ _ │Unit│ _ _ │`
	`A 0 1 2 _ │Net weight (weight value)│ _ │Unit│ _ _ │`
	`A 0 1 3 _ │Tare weight (weight value)│ _ │Unit│`
	The continuous transmission of data records started with the `S X I R` command can be stopped with the commands `S X` or `S X I`.

Example	Command: `S X I`
	Response: Default data record
	`S X _ D _ A 0 1 1 _ _ _ _ _ 2 3 . 6 5 0 _ k g _ │`
	`_ _ A 0 1 2 _ _ _ _ _ 2 1 . 6 5 0 _ k g _ │`
	`_ _ A 0 1 3 _ _ _ _ _ _ 2 . 0 0 0 _ k g _ │`

Switch keyboard on or off

Command	R,0	Switch on keyboard
	R,1	Switch off keyboard
Response	R,0 _ A	Keyboard switched on
	R,1 _ A	Keyboard switched off
Comments	• Factory setting: Keyboard switched on.	
	• When the keyboard is switched off, the terminal cannot be manually operated.	

Changing over to different weight unit

Command	U _ Unit	Change over weight display to different weight unit
	U	Change over weight display to the first weight unit
Response	U _ A	Weight display switched over to another weight unit
	U _ I	Impermissible weight unit
Comment	Possible units: g, kg, lb, ozt, oz, dwt	

Acoustic signal

| Command | D,S | Generate short acoustic signal (beep) in the terminal |
| Response | D,S _ A | Acoustic signal generated in the terminal |

Read application block

Command	A,R _ No.	Read contents of the application block
Response	A,R _ A _ Information	Contents of the application block transmitted
Comments	• The transmitted information is dependent on the application block, see chapter 7.	
	• The number of the application block must be entered as a three-place number with preceding zeros.	

Write application block

Command	`A,W _ No. _ Information`	Write application block
	`A,W _ No.`	Reset application block
	`A,W _ No. _`	Delete application block
Response	`A,W _ A`	Application block written
	`A,W _ I`	Application block not present
	`A,W _ L`	Application block cannot be written
Comments	• The information to be entered is dependent on the target block, see chapter 7.	
	• Deleting and resetting have the same effect.	

Specify DeltaTrac target value

Command	`D,Y _ Target weight (weight value) _ Unit _ Lower tolerance _ Unit _`	
	`Upper tolerance _ Unit`	
	Specify DeltaTrac target value	
	`D,Y`	Delete DeltaTrac target value
Response	`D,Y _ A` DeltaTrac target value loaded/deleted	
Comments	• Observe limit values, see page 18	
	• Also possible: `A,W _ 0,2,0,...`, see page 116	
Example	Command: `D,Y _ 4 . 5 _ k,g _ 5 _ %`	
	Response: `D,Y _ A`	

Print text or barcode with GA46 printer

Command		
	`P` `_` `Text_48`	Print text as per setting
	`P` `_` `$` `!` `1` `Text_48`	Print text in small print
	`P` `_` `$` `!` `2` `Text_48`	Print text in normal print
	`P` `_` `$` `!` `3` `Text_48`	Print text in large print
	`P` `_` `$` `!` `A` `Text_48`	Print text in small type and bold print
	`P` `_` `$` `!` `B` `Text_48`	Print text in normal type and bold print
	`P` `_` `$` `!` `C` `Text_48`	Print text in large type and bold print
	`P` `_` `$` `#` `1` `Text_20, barcode-specific`	Print code 39
	`P` `_` `$` `#` `2` `Text_8, barcode-specific`	Print EAN 8
	`P` `_` `$` `#` `3` `Text_13, barcode-specific`	Print EAN 13
	`P` `_` `$` `#` `4` `Text_20, barcode-specific`	Print code 128
	`P` `_` `$` `#` `5` `Text_20, barcode-specific`	Print code 2 of 5
	`P` `_` `$` `#` `6` `Text_20, barcode-specific`	Print code 2 of 5 interleaved
	`P` `_` `$` `#` `7` `Text_20, barcode-specific`	Print code 128
	`P` `_` `$` `#` `8` `Text_20, barcode-specific`	Print EAN 128
	`P` `_`	Print blank line
Response	`P` `_` `A`	Alphanumeric characters printed
	`P` `_` `L`	no GA46 present
Comments	• Character stock: ASCII character 20 hex/32 dec … 7F hex/127 dec, see page 126.	
	• Printing is carried out in the font size last selected.	
	• Watch upper and lower case.	

Actuating digital outputs

Command		
	`W _ Status`	Switch individual digital outputs on or off
	`W _ Status 1 _ Time 1 _ Status 2 _ Time 2 _ ... Status 4 _ Time 4 _ Status 5`	
		Trigger time sequence of status changes of digital outputs
	`W ,` `W _`	Reset all outputs to logical 0
	Status:	Each output is assigned a value. The total of the values of those outputs which are to be closed is indicated as the "Status".
		Digital output 1 1
		Digital output 2 2
		Digital output 3 4
		Digital output 4 8
		Digital output 5 16
		Digital output 6 32
		Digital output 7 64
		Digital output 8 128
		All outputs open 0
		All outputs closed 255
	Time:	1 ... 99999 ms

Response		
	`W _ A`	Digital outputs set

Comments	
	• Max. 5 statuses "Status" and 4 intervals "Time" are possible. After sequence has been run, digital outputs freeze in last status "Status".
	• A break in the port has no effect on the outputs.
	• If terminal receives a new W command before time sequence has been run, ongoing sequence will be aborted immediately.
	• If the limits for "Status" and "Time" are not adhered to when operating the interface types 4 I/O or relay box 8, the fault message EL appears.

Examples	
	Command: `W _ 5`
	Digital outputs 1 and 3 are closed, all others opened
	Command: `W _ 1 _ 1,0,0,0 _ 3,2 _ 5,0,0,0 _ 3,3 _ 5,0,0 _ 0`
	triggers following sequence:

6.4.4 Error messages

Error messages always consist of 2 characters and a string limit.
The string limit can be defined in the master mode (section 5.6.1).

| E | T | **Transmission error**
The terminal transmits a transmission error for errors in the received bit sequence, e.g. parity error, missing stop bit.

| E | S | **Syntax error**
The terminal transmits a syntax error when it cannot process the received characters, e.g. command not present.

| E | L | **Logic error**
The terminal transmits a logic error, when a command cannot be executed, e.g. when an attempt is made to write an non-writeable application block.

6.5 Profibus DP communication with a PLC

6.5.1 Overview

The ProfibusDP-690 is designed for operation as a slave on the Profibus DP. This provides the following possibilities with a master PLC also connected to the Profibus DP:

- Access to the weight values of the weighing platform connected to the weighing terminal
- Operation of the weighing platforms connected to the weighing terminal (zero-set, taring, setting specified tare values, etc.)
- Triggering key presses, transmitting data strings or display of texts

6.5.2   Data formats

All user data are transmitted in a compressed, up to 4-word long format.

Write table   Format for transmitting user data from the PLC to the ProfibusDP-690.

Read table   Format for the transmission of user data from ProfibusDP-690 to the PLC.

Structure of the write and read table

The write and read table are similarly structured and contain the following sections:

• Value (16-bit integer or 32-bit floating point) for the transmission of weight values, application block numbers, etc.

• Commands or the corresponding responses with a total of 16 bits

• Control of 16 digital I/Os

6.5.3   Handshake

As certain commands can not always be executed immediately by the scale, e.g. taring with a restless weighing platform, 3 handshake bits of the PLC allow clear monitoring of the success of its commands:

1. The PLC starts a command by setting the corresponding command bit and also toggles COMMAND VALID in the write table. All other command bits are 0.

2. The weighing terminal responds with the current data of the read table. If it was possible to completely process the command, the COMMAND EXECUTED bit is toggled. Otherwise COMMAND EXECUTED remains unchanged.

3. The PLC recognises whether it can transmit the next command or must repeat the last one from COMMAND EXECUTED and transmits the write table to the weighing terminal.

4. The weighing terminal recognises from the status change of the COMMAND VALID bit that it should carry out the next command. In addition, the weighing terminal also detects whether the last command has been executed or is still running. If the PLC attempts to start new commands before the previous one has been confirmed by the weighing terminal with a status change of COMMAND VALID, the weighing terminal ignores this new command.

6.5.4 Commands and responses

All commands available to the PLC and the corresponding responses are shown in the following two tables.

Data direction PLC -> IND690   Write table
Data direction IND690 -> PLC   Read table

Write table

16-Bit Integer 2 Words	Word 0		Word 1		
16-Bit Integer 4 Words	**Word 0**		**Word 1**	**Word 2**	**Word 3**
32-Bit Floating Point		**Word 0** / **Word 1**	**Word 2**	**Word 3**	
Bit	**Value** 16-Bit	**Value** 32-Bit Floating Point	**Command**	**16 Digital I/O**	**AB data**
0		Mantissa	Command valid Toggle-bit for all commands	Setting of IND690 outputs or Displaying or evaluating inputs of external I/O module	Data for writing an application block Tolerance specifications are handled in % if the sign is set to 1.
1			Bits 1/2/3: Selection of read-table value, read/write AB 0/0/0 = Display 1/0/0 = Net 0/0/1 = Key No. 1/0/1 = Read AB 0/1/0 = Gross 1/1/0 = Tare 0/1/1 = Write AB 1/1/1 = Not in use		
2					
3					
4			Bits 4/5/6: Selection of write-table value 0/0/0 = Empty 1/0/0 = Tare specification 0/0/1 = Setpoint 1 1/0/1 = Setpoint 2 0/1/0 = Key No. 1/1/0 = Fixed Text No. 0/1/1 = Setpoint 3 1/1/1 = Setpoint 4		
5					
6					
7		Mantissa	Taring		
8			Delete tare		
9			Set to zero		
10			ENTER key		
11		Exponent	Input mode		
12			Switch keyboard on/off		
13			Bits 13/14/15: Selection of weighing platform 0/0/0 = None 1/1/0 = Scale 3 1/0/0 = Scale 1 0/0/1 = Scale 4 0/1/0 = Scale 2 1/0/1= Sum scale		
14					
15	Sign	Sign			Sign

Read table

16-Bit Integer 2 words	Word 0		Word 1		
16-Bit Integer 4 words	**Word 0**		**Word 1**	**Word 2**	**Word 3**
32-Bit Floating Point		**Word 0** **Word 1**	**Word 2**	**Word 3**	
Bit	**Value** 16-Bit	**Value** 32-Bit Floating Point	**Command**	**16 Digital I/O**	**Not in Use**
0		Mantissa	Command executed Toggle-bit for all commands	Showing or reading of IND690 inputs or Displaying or setting outputs of external I/O module	
1			Error command		
2			Movement		
3			Net		
4			Error scale (overload/underload…)		
5			Key(s) was/were pressed		
6			Input mode active		
7		Mantissa	Setpoint 1 reached		
8			Setpoint 2 reached		
9			Setpoint 3 reached		
10			Setpoint 4 reached		
11		Exponent	1 = keyboard blocked, 0 = keyboard unblocked		
12			Second unit 0 = first unit, 1 = second unit		
13			Bits 13/14/15: Current weighing platform 0/0/0 = None 1/1/0 = Scale 3 1/0/0 = Scale 1 0/0/1 = Scale 4 0/1/0 = Scale 2 1/0/1= Sum scale		
14					
15	Sign	Sign			

Notes on commands

If the command requires parameters, they will be transmitted either as an integer value or as a floating point value depending on the operating mode set.

Exception: The commands READ/WRITE APPLICATION BLOCK and PRESS KEY always expect integer values as parameters.

Read commands

- The read commands Display value, Net, Gross, Tare, Key and Application block overwrite the cyclically transmitted display values with the required data. The data are transmitted as 16-bit integers or 32-bit floating points. As soon as the COMMAND EXECUTED bit is toggled, these values must be evaluated immediately by the PLC, as in the next cycle the value in the read table is overwritten again with the current weight value.

- The response to the READ KEY NUMBER command (write table bits 1/2/3 = 0/0/1) is transmitted in the Word 0 (16-bit integer) or in Word 1 (32-bit floating point). The low byte contains the keyboard code, the high byte the function key code.

  The weighing terminal can store a maximum of 10 keys for being called via the READ KEY NUMBER command. If they are not called, the oldest key actuations are overwritten.

  After reading out the last stored key, the KEY WAS PRESSED bit is reset. The key memory is cleared after the device is switched on and after the master mode is exited.

Key numbers

Number	Function key
00	Standard keys of IND690-Base
02	Extended tare keys of ID690-Base
51	Standard keys of Pac
52 …	Extended keys of Pac Only when the Pac is equipped with more than one function key page, i.e. more than 6 function keys

Reading and writing application blocks

- When writing an application block, the desired data are simultaneously transferred with Word 3. For this reason, writing application blocks is only possible in 16-bit integer/4-word mode.

- Only application blocks with the formats "numeric" or "weight value" can be read or written. When writing, certain tolerance (sub-)blocks (e.g. with DeltaTrac) can be intentionally written with the format "percent" by setting the sign to "1".

- If a non-existent block or an alphanumeric block is selected, the IND690 responds with ERROR COMMAND.

  The requested data are supplied in the 16-bit integer mode in the same format as the weight value, and in the 32-bit floating point mode floating point values are always transmitted.

The **application block number** in the write table must be entered as a value (Word 0 in 16-bit integer mode, Word 1 in 32-bit floating point mode) in the following format for the READ APPLICATION BLOCK and WRITE APPLICATION BLOCK commands:

"Basic" application block

	Sub-block no.				Exp.		Application block number									
Bit	**15**	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**
Example	**S**	**S**	**S**	**S**	**E**	**E**	**A**	**A**	**A**	**A**	**A**	**A**	**A**	**A**	**A**	**A**
AB 10	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
AB 20, sub-block 2	0	0	1	0	0	0	0	0	0	0	0	1	0	1	0	0

Expanded application block

Condition
One or more expanded application blocks are selected in master mode.

Example
Application block 21 is selected as the 1st expanded application block,
application block 46 is selected as the 2nd expanded application block.

	Sub-block no.				Exp.		Index of the expanded AB									
Bit	**15**	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**
Example	**S**	**S**	**S**	**S**	**E**	**E**	**A**	**A**	**A**	**A**	**A**	**A**	**A**	**A**	**A**	**A**
AB 21_007	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	1
AB 46_005, SB 1	0	0	0	1	1	0	0	0	0	0	0	0	0	1	0	1

Input of tolerances in %
If the sign (bit 15) in Word 3 is set to 1, tolerance specifications can be written accurately down to one decimal place in %.
This rule applies in the same way for Word 0 (16-bit integer) and Word 1 (32-bit floating point) when reading.

Example	**Decimal**	**Binary**															
		15	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**
100.0 %	−1000	1	0	0	0	0	0	1	1	1	1	1	0	1	0	0	0
1 %	−10	1	0	0	1	1	0	0	0	0	0	0	0	1	0	1	0
0.1 %	−1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

Write commands
- The write command PRESS KEY requires the low byte keyboard code and the high byte function key code as parameters.
- The function key code is based on the active function keys and must be correctly specified for each PRESS KEY command. A function key change can also automatically be forced by changing the function key code, e.g. from REF 10 (3301 hex) to X10 (0004 hex).
- The setpoints loaded via the WRITE SETPOINT X commands (e.g. Setpoint 1: write table bits 4/5/6 = 0/0/1) are deleted after switch-on and each time the master mode is run. The Tolerance parameter in the setpoint modes Checking and Filling must be specified in the 16-bit integer mode with 2 decimal places, e.g. 1025 for 10.25 %.

6.5.5 Digital I/Os

The operating mode of an I/O interface (4 I/O-690 or a relay box 8-690) installed on the IND690 is dependent on where the I/Os are located (directly on the IND690 or externally on the Profibus) and on the parameters CONTROL INPUTS, CONTROL OUTPUTS.

	Outputs	**Inputs**
No I/Os on IND690	The weighing terminal controls external outputs via the read table.	The weighing terminal reads external inputs from the write table and executes predefined actions.
I/Os on IND690 (4 I/O-690 or 8-690 relay box), inputs and outputs configured to CONTROL INTERNAL	The weighing terminal controls internal outputs and displays these in the read table.	The weighing terminal reads internal inputs and executes predefined actions; the PLC has no access.
I/Os on IND690 (4 I/O-690 or 8-690 relay box), inputs and outputs configured to CONTROL EXTERNAL	The PLC controls the outputs of the weighing terminal via the write table.	The weighing terminal reads internal inputs and displays these in the read table.

6.5.6 Messages in display

The following messages may appear briefly in the display:

Message	Meaning
PROFIBUS NOT ACTIVE!	• Initialisation processes are still running on Profibus DP. • The weighing terminal is not yet connected to the Profibus DP.
PROFIBUS ACTIVE	• Readiness restored, e.g. after switch-on, exiting master mode or following a bus interruption.
PROFIBUS – ERROR BCC RX PROFIBUS – ERROR BCC TX	• Weighing terminal or field bus module have detected a BCC error.
PROFIBUS – ERROR DATA RX PROFIBUS – ERROR DATA TX	• Communication error weighing terminal <–> Field bus module: e.g. not ETX, Uart error, etc.
PROFIBUS – TIMEOUT IND690	• Communication error weighing terminal <–> Field bus module: The weighing terminal does not respond within the defined time.
PROFIBUS – ERROR CONF.	• The field bus module has not received the configuration data properly.

6.5.7 GSD file

The GSD file required for communication with the ProfibusDP-690 is available from METTLER TOLEDO Service or can be downloaded from the Profibus GSD Library at **http://www.profibus.com**.

6.5.8 Profibus DP-690 demo kit

For a demonstration and test of all commands with a normal PC, ask METTLER TOLEDO Customer Service for the ProfibusDP-690 demo kit.

7 Application blocks

Application blocks are internal information memories in which weighing data, calculated quantities, configuration data or character sequences entered with the keypad are stored. The content of the application blocks can be read out or written to with a computer.

When the GA46 printer is connected, the assignment of the application blocks can be printed out, see operating instructions for the GA46 printer.

7.1 Syntax and formats

The syntax and formats are dependent on the command set selected in the dialog mode, see page 56.

7.1.1 Read application block

Read
| A | R | No. |

| A | R | _ | No. |

MMR command set

SICS command set

The weighing terminal receives the command from the computer to read out the content of the "No." application block. Possible formats for "No." are:

xxx	Entire application block
xxx.zz	Sub-block of an application block
xxx_yyy	Read-only memory
xxx_yyy.zz	Sub-block of a read-only memory

This read command is **not** contained in the following description of the application blocks.

Response
| A | B | _ | Information |

| A | R | _ | A | _Information |

MMR command set

SICS command set

As a response the weighing terminal transmits the content of the "No." application block to the computer.

This response is contained in the following description of the application blocks in the MMR version.

Example

Command MMR | A | R | 0 | 2 | 1 | _ | 0 | 0 | 1 |

Command SICS | A | R | _ | 0 | 2 | 1 | _ | 0 | 0 | 1 |

Read out tare memory 1.

Response MMR | A | B | _ | _ | _ | _ | _ | _ | _ | 1 | 0 | . | 5 | _ | k | g | _ |

Response SICS | A | R | _ | A | _ | _ | _ | _ | _ | _ | 1 | 0 | . | 5 | _ | k | g | _ |

Note

If an application block is not in use, the weighing terminal transmits the corresponding number of blank spaces in place of the data.

For example, when Tare Memory 1 is not in use, the weighing terminal transmits the following response:

`A┐B|_|_┐_┐_┐_┐_┐_┐_┐_┐_┐_|_┐_┐_|` (MMR) resp.

`A┐W|_|A|_┐_┐_┐_┐_┐_┐_┐_┐_┐_┐_|_┐_┐_|` (SICS)

7.1.2   Write to application block

Write   `A┐W|No.|_|Information`   MMR command set

`A┐W|_|No.|_|Information`   SICS command set

The weighing terminal receives the command from the computer to write to the "No." application block.

This command is contained in the following description of the application blocks in the MMR version.

Response   `A┐B`   MMR command set

`A┐W|_|A`   SICS command set

The weighing terminal transmits a confirmation to the computer.

This response is **not** contained in the following description of the application blocks.

Example   Command MMR

Command SICS

`A┐W|0┐2┐1┐_┐0┐0┐1|_|1┐2┐.┐0|_|k┐g┐_`

`A┐W|_|0┐2┐1┐_┐0┐0┐1|_|1┐2┐.┐0|_|k┐g┐_`

Write to tare memory 1.

Response MMR   `A┐B`

Response SICS   `A┐W|_|A`

Notes

- Only those application blocks can be written to for which the corresponding AW command is listed in the following description.

- An application block can consist of one or more sub-blocks, and the numbering of the sub-blocks begins with 1.

- The sub-blocks of an application block can each contain a maximum of 20 characters.

- The sub-blocks are separated with $$ or H$_T$ (ASCII character 09 hex/9 deci):

  `A┐W|No.|_|Sub-block 1|$┐$|Sub-block 2|$┐$|...|Sub-block n` (MMR) resp.

  `A┐W|_|No.|_|Sub-block 1|$┐$|Sub-block 2|$┐$|...|Sub-block n` (SICS)

- Extensive application blocks are displayed so that each sub-block begins in a new line.

- To write to individual sub-blocks, enter the corresponding number of $ characters. If only sub-block 1 is written to, the $ characters are eliminated, e.g. sub-block 3 written to: `A┐W|No.|_|$┐$|$┐$|Sub-block 3` (MMR) resp.

  `A┐W|_|No.|_|$┐$|$┐$|Sub-block 3` (SICS).

7.1.3 Data formats

- In the following description of the application blocks the following data formats are used:

Weight value	10 digits with sign and decimal point, right-justified (with preceding blank space)
Unit	3 characters, left-justified (with following blank spaces)
Number_n	Number, n digits, right-justified (with preceding blank spaces)
Text_n	maximum of n characters If the SICS command set is used, "Text" must always be placed in inverted commas.

- Conclude commands and responses with the string frame $C_R L_F$
  (ASCII characters C_R = 0D hex/13 deci, L_F = 0A hex/10 deci).
  The string frame is **not** contained in the following description.

7.1.4 Read and write application blocks with the SICS command set

In the following description, the application blocks are shown in the syntax for the MMR command set. When used with the SICS command set, please observe the following SICS conventions, also see sections 7.1.1 to 7.1.3 :

- A blank space must be entered between AR or AW and the application block number: E.g. | A | R | _ | No. |

- The command identification is repeated in the response and a blank space and the character A added:
  | A | R | _ | A | _ | Information | application block transmitted and
  | A | W | _ | A | application block written.

- Texts entered or transmitted are always in inverted commas.

Example **Read application block for CODE A**
Command: | A | R | _ | 0 | 9 | 4 |
Response: | A | R | _ | A | _ | "Article" |

Write application block for CODE A
Command: | A | W | _ | 0 | 9 | 4 | _ | "Article" |
Response: | A | W | _ | A |]

7.2   List of the application blocks

No.	Content	Format	
001	Terminal type	Response:	`A,B _ Mettler-Toledo_IND690`
002	Program number	Response:	`A,B _ IP60-0-0xxxx _`
004	Serial number	Response:	`A,B _` `Identification (Text_20)` `_,_`
			`SN Terminal (Number_7)` `_,_`
			`SN Scale 1 (Number_14)` `_,_`
			`SN Scale 2 (Number_14)` `_,_`
			`SN Scale 3 (Number_14)` `_,_`
			`SN Scale 4 (Number_14)` `_,_`
			`SN Mainboard (Number_24)`
		Write:	`A,W 0,0,4 _` `Identification (Text_20)`
005	Keyboard	Response:	`A,W _` `Keyboard`
		Write:	`A,W 0,0,5 _ $ $` `Text`
		Note:	Only possible as long as input active on IND690. The text is then written into the input field
006	Electronic finger	Response:	`A,B _` `Keys` `_,_` `key number`
		Write:	`A,W 0,0,6 _ $ $ 2,4`
		Note:	See table in the Appendix for key numbers

007 007.01 007.02	Current gross weight (2nd weight unit)	Response:	`A,B _` `Weight value` `_` `Unit`
			 `A,B _` `Weight value`
			 `A,B _` `Unit`

008 008.01 008.02	Current net weight (2nd weight unit)	Response:	`A,B _` `Weight value` `_` `Unit`
			 `A,B _` `Weight value`
			 `A,B _` `Unit`

009 009.01 009.02	Current tare weight (2nd weight unit)	Response:	`A,B _` `Weight value` `_` `Unit`
			 `A,B _` `Weight value`
			 `A,B _` `Unit`

		Write:	`A,W 0,0,9 _` `Weight value` `_` `Unit`
010	Current weighing platform	Response:	`A,B _` `Number_2`
		Write:	`A,W 0,1,0 _` `Number_2` Switch over weighing platform

011 011.01 011.02	Current gross weight (1st weight unit)	Response:	`A,B _` `Weight value` `_` `Unit`
			 `A,B _` `Weight value`
			 `A,B _` `Unit`

012 012-01 012-02	Current net weight (1st weight unit)	Response:	`A,B _` `Weight value` `_` `Unit`
			 `A,B _` `Weight value`
			 `A,B _` `Unit`

No.	Content	Format

013
013.01
013.02
	Current tare weight (1st weight unit)	Response: `A,B _ Weight value _ Unit`
		`A,B _ Weight value`
		`A,B _ Unit`
		Write: `A,W 0,1,3 _ Weight value _ Unit`

014	Content of display	Response: `A,B _ Display` Display = Text_20 or weight value
015	Date	Response: `A,B _ Date` Write: `A,W 0,1,5 _ Date` Comment: The date is sent in the format selected in the master mode.
016	Dynamic weighing	Response: `A,B _ Weight value _ Unit` Write: `A,W 0,1,6 _ No. of cycles` Start weighing cycle Comment: No. of cycles = 1 … 255
018	Difference target/ actual weight	Response: `A,B _ Weight value _ Unit`
019	Date and time	Response: `A,B _ Date _ Time` Write: `A,W 0,1,9 _ Date $ $ Time` Comment: Date and time are sent in the format selected in the master mode.

020	Current DeltaTrac	Response: `A,B _ Target weight (weight value) _ Unit _ _`
		`lower tolerance (weight value) _ Unit _ _`
		`upper tolerance (weight value) _ Unit`
		Write: `A,W 0,x,x _ Target weight (weight value) _ Unit $ $`
		`lower tolerance (weight value) _ Unit $ $`
		`upper tolerance (weight value) _ Unit`
		Comment: xx = 20

021_001 … 021_999	Tare memory 1 … 999	Response: `A,B _ Weight value _ Unit _ _ Name (Text_30)` Write: `A,W 0,x,x,_,x,x,x _ Weight value _ Unit $ $` `Name (Text_30)` Comment: xx_xxx = 21_001 … 21_999
021 … 045	Tare memory 1 … 25	Response: equal to 021_001 Write: equal to 020_001 Comment: xx_xxx = 21 … 45 The contents of the tare memories 1 … 25 are identical to the contents of the tare memories 021_001 … 021_025.
046_001 … 046_999	DeltaTrac memory 1 … 999	Response: equal to 020 Write: equal to 020 Comment: xx = 46_001 … 46_999

No.	Content	Format	
046 … 070	DeltaTrac memory 1 … 25	Response: Write: Comment:	equal to 020 equal to 020 xx = 46 … 70 The contents of the DeltaTrac memories 1 … 25 are identical to the contents of the DeltaTrac memories 046_001 … 046_025.

071_001
…
071_999
	Text memory
	1 … 999
		Response:
		Write:
		Comment:
			`A,B _ Text_30`
			`A,W 0,x,x,_,x,x,x _ Text_30`
			xx = 71_001 … 71_999

071 … 090	Text memory 1 … 20	Response: Write: Comment:	equal to 071_001 equal to 071_001 xx_xxx = 71 … 90 The contents of the text memories 1 … 20 are identical to the contents of the text memories 071_001 … 071_020.

091	Barcode EAN 28,
	EAN 128
		Response:
		
		EAN 28:
		
		EAN 128 01:
		
		EAN 128 310:
		
		EAN 128 330:
			`A,B _ EAN 28 _ _ EAN 128 01 _ _ EAN 128 310 _ _`
			`EAN 128 330`
			`2,8 Article Check digit Weight`
			Article: 4-digit article No. from memory Code A
			Check digit: 1-digit, calculated by IND690-Base for the weight
			Weight: 5-digit positive weight value with 3 decimal places between 00.000 kg - 99.999 kg
			`0,1 Article` or
			`0,1 Article Check digit` or
			`0,1,0 Article Check digit` or
			`0,1,0 Article`
			Article: Article No. from memory Code A, max. 14 digits
			Check digit: 1-digit, calculated by IND690-Base
			Length: total of max. 16 digits
			`0,1,9 Article Check digit 3,1,0,x Weight` or
			`0,1,9 Article 3,1,0,x Weight`
			Article: Article No. from memory Code A max. 12 or 13 digits
			Check digit: 1-digit calculated by IND690-Base
			x: 0 … 6, decimal places of weight value
			Weight: 6-digit net weight value
			`3,3,0,x Weight`
			x: 0 … 6, decimal places of weight value
			Weight: 6-digit gross weight value

No.	Content	Format		
092	Barcode EAN 29	Response: Comment:	`A B _ 2 9 Article Check digit Weight` Article: 4-digit article no. from memory Code A Check digit: 1-digit no., calculated from IND690-Base for the weight Weight: 5-digit positive weight value with 3 places to right of point between 00.000 kg … 99.999 kg	
093	Barcode EAN 29 A	Response: Comment:	`A B _ 2 9 Article Weight` Article: 5-digit article no. from memory Code A Weight: 5-digit positive weight value with 3 places to right of point between 00.000 kg … 99.999 kg	

094 …
099
	Identification data
	Code A … Code F
		Response:
		Write:
		Comment:
			`A B _ Name (text_20) _ _ Identification (text_30)`
			`A W 0 x x _ Name (text_20) $ $ Identification (text_30)`
			xx = 94 … 99	

101 …
109
	Status
	COM1 … COM9
		Response:
		
		Write*:
		Note:
			`A B _ HW (Text_21 _ _ Mode (Text_21 _ _`
			`Status (Text_21 _ _ Settings (Text_31)`
			`A W 1 0 x _ Transmit buffer COMx`
			x = 1 … 9
			The information entered is sent directly via the selected interface.
			The max. data length of a transmit buffer is 246 characters.	

110	Scales ID	Response:
		
		Note:
			`A B _ Scale No. Scale 1 (Number_2) _ _`
			`Scale No. Scale 2 (Number_2) _ _`
			`Scale No. Scale 3 (Number_2) _ _`
			`Scale No. Scale 4 (Number_2) _ _`
			`Scale No. Sum scale (Number_2)`
			This block only contains data if the setting PARALLEL SCALES is selected under the SCALES MODE.
			When a sum scale is configured, the scale number 05 is output in the last sub-block. If no sum scale is configured, the last sub-block is empty.	

111_001 … 111_005	Gross weight, scales 1 … 4, sum scale	Response: Note:	`A B _ Weight value _ Unit` This block only contains data if the setting PARALLEL SCALES is selected under the SCALES MODE.	
112_001 … 112_005	Net weight, scales 1 … 4, sum scale	Response: Note:	`A B _ Weight value _ Unit` This block only contains data if the setting PARALLEL SCALES is selected under the SCALES MODE.	

113_001
…
113_005
	Tare weight, scales 1 … 4, sum scale	Response:
		Write:
		Note:
			`A B _ Weight value _ Unit`
			`A W 1 1 3 _ 0 0 x Weight value _ Unit`
			x = 1 … 5
			This block only contains data if the setting PARALLEL SCALES is selected under the SCALES MODE.	

115	Status terminal	Response:	`A B _ Status`	

No.	Content	Format
116	Fault/event memory	**Response:** `A,B _ Type (Number_2) _,_ Quantity (Number-2)`
117_001 … 117_005	Gross weight, (2nd weight unit) scales 1 … 4, sum scale	**Response:** `A,B _ Weight value _ Unit` **Note:** This block only contains data if the setting PARALLEL SCALES is selected under the SCALES MODE.
118_001 … 118_005	Net weight, (2nd weight unit) scales 1 … 4, sum scale	**Response:** `A,B _ Weight value _ Unit` **Note:** This block only contains data if the setting PARALLEL SCALES is selected under the SCALES MODE.
119_001 … 119_005	Tare weight, (2nd weight unit) scales 1 … 4, sum scale	**Response:** `A,B _ Weight value _ Unit` **Write:** `A,W,1,1,3 _ 0,0,x Weight value _ Unit` **Note:** x = 1 … 5 This block only contains data if the setting PARALLEL SCALES is selected under the SCALES MODE.
120	Disabling / Enabling keys	**Response:** `A,B _ x,x,x,… (37 places)` **Write:** `A,W,1,2,0 _ x,x,x,… (37 places)` **Note:** x = 1: Key enabled x = 0: Key disabled The position of the numerals corresponds to the table in section 10.2 , beginning with 0. The setting is retained when the weighing terminal is switched off. **Example:** `A,W,1,2,0 _` `0000000000000001000000000000000111100` : All keys disabled except for F6 and the cursor keys.
181 … 184	Parameters for scale 1 … 4	**Response:** `A,B _ Scale parameters` **Note:** For service information purposes the internal scale parameters can be read out/printed; the structure and content are scale-dependent.
185	Parameters for sum scale	**Response:** `A,B _ Sum scale parameters`

199	Number of last Alibi entry	**Response:** `A,B _ Number_6 _,_ Date _,_ Time _,_`
		`Gross (Weight value) _,_`
		`Net (Weight value _,_`
		`Tare (Weight value)`
		Note: Date and time as in application block 019.

201	Application	**Response:** `A,B _ IND690 ,_ TOTALIZING`
202	Version application	**Response:** `A,B _ IP60_1_0105`

205 205.01 205.02	Start and end value for the item counter	**Response:** `A,B _ Start value (Number 4) _ End value (Number 4)`
		`A,B _ Start value (Number 4)`
		`A,B _ End value (Number 4)`

No.	Content	Format
206	Item counter	Response: `A͵B _ Item (Number 4)`
207	Transaction number	Response: `A͵B _ Transaction number (Number 6)`
208	Last process	Response: `A͵B _ Process (Number 1)` Remark: Last process carried out 1 = Totalizing 2 = Manual input 4 = Cancelled

211
211.01
211.02
	Sum gross	Response: `A͵B _ Weight value _ Unit`
		`A͵B _ Weight value`
		`A͵B _ Unit`

212
212.01
212.02
	Sum net	Response: `A͵B _ Weight value _ Unit`
		`A͵B _ Weight value`
		`A͵B _ Unit`

213
213.1
213.2
	Sum tare	Response: `A͵B _ Weight value _ Unit`
		`A͵B _ Weight value`
		`A͵B _ Unit`

214
214.01
214.02
	Last gross	Response: `A͵B _ Weight value _ Unit`
		`A͵B _ Weight value`
		`A͵B _ Unit`

215
215.01
215.02
	Last net	Response: `A͵B _ Weight value _ Unit`
		`A͵B _ Weight value`
		`A͵B _ Unit`

216
216.01
216.02
	Last tare	Response: `A͵B _ Weight value _ Unit`
		`A͵B _ Weight value`
		`A͵B _ Unit`

217	Mean value	Response: `A͵B _ Weight value _ Unit`
218	Standard deviation	Response: `A͵B _ Weight value _ Unit`
219	Minimum x_{min}	Response: `A͵B _ Weight value _ Unit`
220	Maximum x_{max}	Response: `A͵B _ Weight value _ Unit`
701	Description of application	Response: `A͵B _ ID690-Interfaces`
702	Program designation	Response: `A͵B _ IK07-0-0300`
706, 708, 710, 712, 714, 716, 718, 720	Dig. outputs 1 … 8	Response: `A͵B _ 8-digit binary value` Write: `A͵W 7͵x͵x _ 8-digit binary value` Note: xx = 06, 08, 10, 12, 14, 16, 18, 20 8-digit binary value: Bit8, Bit7 … Bit1 Bit8 = Output 8 … Bit1 = Output 1

No.	Content	Format	
707, 709, 711, 713, 715, 717, 719, 721	Dig. inputs 1 … 8	Response: Note:	`A B _ 8-digit binary value` 8-digit binary value: Bit8, Bit7 … Bit1 Bit8 = Input 8 … Bit1 = Input 1

722, 723	COM5 analog output, COM6 analog output	Response:	**Start-Stop mode**
			 `A B _ A Application block for COM5 (Number_3) _ _`
			 `Start value (weight value) _ Unit _ _`
			 `Stop value (weight value) _ Unit _ _`
			 `Start value voltage/current _ Unit _ _`
			 `Stop value voltage/current _ Unit` *
			 DeltaTrac mode
			 `A B _ A Application block for COM5 (Number_3) _ _`
			 `Start value voltage/current _ Unit _ _`
			 `Stop value voltage/current _ Unit _ _`
			 `Tolerance voltage/current _ Unit` *
			 ΔW-ΔT mode
			 `A B _ A Application block for COM5 (Number_3) _ _`
			 `Start value voltage/current _ Unit _ _`
			 `Delta voltage/current _ Weight unit/sec` *

		Write:	**Start-Stop mode**
			 `A W 7 x x _ A Application block for COM5 (Number_3) $ $`
			 `Start value (weight value) _ Unit $ $`
			 `Stop value (weight value) _ Unit $ $`
			 `Start value voltage/current _ Unit $ $`
			 `Stop value voltage/current _ Unit` *
			 DeltaTrac mode
			 `A W 7 x x _ A Application block for COM5 (Number_3) $ $`
			 `Start value voltage/current _ Unit $ $`
			 `Stop value voltage/current _ Unit $ $`
			 `Tolerance voltage/current _ Unit` *
			 ΔW-ΔT mode
			 `A W 7 x x _ A Application block for COM5 (Number_3) $ $`
			 `Start value voltage/current _ Unit $ $`
			 `Delta voltage/current _ Weight unit/s` *

		Note:	xx = 22: COM5 xx = 23: COM6

724 … 731	Set point 1	Response:	`A B _ Set point (Text_2) _ _`
			 `A x x x _ y y y . z z _ _`
			 `Scale (Text_3) _ _`
			 `Set point value (weight value)`

		Write:	`A W 7 2 x _ Set point type (Text_2) $ $`
			 `A x x x _ y y y . z z $ $`
			 `Scale (Text_3) $ $`
			 `Set point value (weight value)`

		Note:	xx = 24 … 31 Set point type: F↑, F↓, D↑, D↓ Scale: W1, W2, W3, ALL

8 What to do if …?

Error / Display	Possible causes	Remedy
Display is dark	• No mains voltage	➜ Check mains
	• Terminal switched off	➜ Switch on terminal
	• Power cord not connected	➜ Plug in power plug
	• Brief malfunction	➜ Switch terminal off and on again
	• Switch-off time too short in storage battery operation at the IND690-24V	➜ Switch off power for 10 seconds
	• Storage battery level too low at the IND690-24V	➜ Charge storage battery
	• Operating-mode selector switch for storage battery operation/mains operation set incorrectly at the IND690-24V	➜ Set operating-mode selector switch to desired operating mode
Underload	• Load plate not in place	➜ Apply load plate
	• Preload not applied	➜ Apply preload
	• Weighing range dropped below	➜ Set zero
Overload	• Weighing range exceeded	➜ Relieve weighing platform
	• Weighing platform locked	➜ Release lock
Weight display unstable	• Agitated set-up location	➜ Adjust vibration adapter
	• Draft	➜ Avoid drafts
	• Contact between load plate and/or weighing sample and surroundings	➜ Eliminate contact
	• Power malfunction	➜ Check mains
Wrong weight display	• Wrong setting to zero of weighing platform	➜ Relieve weighing platform, set to zero and repeat weighing
	• Wrong tare weight	➜ Delete tare or enter right tare value
	• Contact between load plate and/or weighing sample and surroundings	➜ Eliminate contact
	• Weighing platform tilted	➜ Level weighing platform
	• Wrong weighing platform selected	➜ Select right weighing platform
A whistle sound is emitted in the IND690-24V	• Storage battery level too low	➜ Charge storage battery or switch over to 24 VDC mains operation
WRONG CODE	• Wrong personal code	➜ Enter right personal code

Error / Display	Possible causes	Remedy
SCALE NO. ERROR	• Error in weighing cell	➜ Repeat test ➜ If the message appears again: contact METTLER TOLEDO Customer Service
OUT OF RANGE	• Zero set range exceeded • Gross weight negative • Taring range exceeded • Entered value outside permissible range	➜ Relieve weighing platform ➜ Relieve weighing platform and set to zero ➜ Relieve weighing platform and set to zero ➜ Enter permissible value
NOT ALLOWED	• Weighing platform does not exist • Print with negative weight value	➜ Connect weighing platform ➜ Relieve weighing platform, set to zero and repeat weighing
NOT EXISTENT	• Recalled memory not assigned	➜ Recall other memory
NO DATA TRANSFER	• Weighing platform does not transmit data to the terminal	➜ Switch terminal off and on again ➜ If the message appears again: contact METTLER TOLEDO Customer Service
INTERF. COM X – BREAK	• Break in receiving cable of specified interface	➜ Check cable and connectors ➜ Check external devices (on/off)
TRANSMIT BUFFER FULL	• No transmission • Too many key messages and baud rate too low	➜ Check handshake ➜ Increase baud rate
KEY BUFFER FULL	• Data string currently being edited contains too many blocks	➜ Remove blocks from data string
ERROR BARCODE	• The specified application block contains no data • Wrong sub-block selected, e.g. sub-block 0	➜ Select application block which contains data ➜ Select permissible sub-block
NO BLOCK	• Entered application block does not exist	➜ Enter different application block
BUFFER IS FULL	• Data string of transfer key contains more than 10 application blocks	➜ Change configuration of transfer key
DISPLAY MODE	• Weighing cell defective	➜ Contact METTLER TOLEDO Customer Service

Error / Display	Possible causes	Remedy
NO ANALOG OUTPUT	• Resolution or maximum load of the selected weighing bridge was changed	→ Reconfigure Interface AnalogOut-690 in master mode
SCALE NUMBER DOUBLED	• 2 weighing platforms with same scale number connected	→ Contact METTLER TOLEDO Customer Service

9 Technical data and accessories

Weighing functions	
Tare compensation	At the press of a button or automatically, up to maximum load (subtractive)
Tare target value	• For single-range scales over entire weighing range (subtractive) • For multi-range scales depending on national calibration regulations • 999 stored tare memories, protected against power failure
Tare indicator	NET lights up with saved tare weight
DeltaTrac	• Analog display of dynamic measured values • With optical marks for target value and tolerances • Asymmetric tolerances possible • 3 selectable applications • 999 DeltaTrac memories, protected against power failure
Setting to zero	Automatic or manual
Gross changeover	Display of weight value can be changed over to gross weight at press of a button
Unit changeover	Unit can be changed over to weight units kg, g, lb, oz, ozt, dwt in dependence on national calibration regulations at press of a button
Stabilization detector	4-step, with motion indicator
Weighing process adapter	3-step adjustment to weighing sample
Vibration adapter	3-step adjustment to ambient conditions
MinWeigh	• Weight values below the minimum weighing-in quantity are identified with ⚖ • Minimum weighing-in quantity fixed or calculated
Identification data	• 6 memories for 30 alphanumeric characters, can be recalled with keys A to F • Each memory can be assigned a fixed name which can be written in the marking field next to the corresponding key • 999 memories for frequently used identification data
Info function	Displays of current weighing data, identification data and memories at the press of a button
Date and time	• For printout or output via the data interface • Quartz-controlled, 12 or 24-hour display, automatic calendar function, Europe, USA or free format, safe against power failure • Automatic summer time switchover

10 Appendix

10.1 ASCII table

hex	deci	ASCII US	hex	deci	ASCII US	hex	deci	ASCII US	hex	deci	ASCII US	hex	deci	ASCII US
00	0	NUL	34	52	4	68	104	h	9C	156	£	D0	208	⊥
01	1	SOH	35	53	5	69	105	i	9D	157	¥	D1	209	⊤
02	2	STX	36	54	6	6A	106	j	9E	158	₧	D2	210	⊥
03	3	ETX	37	55	7	6B	107	k	9F	159	ƒ	D3	211	⊥
04	4	EOT	38	56	8	6C	108	l	A0	160	á	D4	212	⊢
05	5	ENQ	39	57	9	6D	109	m	A1	161	í	D5	213	⊢
06	6	ACK	3A	58	:	6E	110	n	A2	162	ó	D6	214	⊤
07	7	BEL	3B	59	;	6F	111	o	A3	163	ú	D7	215	╫
08	8	BS	3C	60	<	70	112	p	A4	164	ñ	D8	216	╪
09	9	HT	3D	61	=	71	113	q	A5	165	Ñ	D9	217	┘
0A	10	LF	3E	62	>	72	114	r	A6	166	ª	DA	218	┌
0B	11	VT	3F	63	?	73	115	s	A7	167	°	DB	219	█
0C	12	FF	40	64	@	74	116	t	A8	168	¿	DC	220	▄
0D	13	CR	41	65	A	75	117	u	A9	169	⌐	DD	221	▌
0E	14	SO	42	66	B	76	118	v	AA	170	¬	DE	222	▐
0F	15	SI	43	67	C	77	119	w	AB	171		DF	223	▀
10	16	DLE	44	68	D	78	120	x	AC	172		E0	224	α
11	17	DC1	45	69	E	79	121	y	AD	173	¡	E1	225	ß
12	18	DC2	46	70	F	7A	122	z	AE	174	«	E2	226	Γ
13	19	DC3	47	71	G	7B	123	{	AF	175	»	E3	227	π
14	20	DC4	48	72	H	7C	124	l	B0	176	░	E4	228	Σ
15	21	NAK	49	73	I	7D	125	}	B1	177	▒	E5	229	σ
16	22	SYN	4A	74	J	7E	126	~	B2	178	▓	E6	230	µ
17	23	ETB	4B	75	K	7F	127	⇧	B3	179	│	E7	231	τ
18	24	CAN	4C	76	L	80	128	reserved	B4	180	┤	E8	232	Φ
19	25	EM	4D	77	M	81	129	ü	B5	181	╡	E9	233	Θ
1A	26	SUB	4E	78	N	82	130	é	B6	182	╢	EA	234	Ω
1B	27	ESC	4F	79	O	83	131	â	B7	183	╖	EB	235	δ
1C	28	FS	50	80	P	84	132	ä	B8	184	╕	EC	236	∞
1D	29	GS	51	81	Q	85	133	à	B9	185	╣	ED	237	ø
1E	30	RS	52	82	R	86	134	å	BA	186	║	EE	238	ε
1F	31	US	53	83	S	87	135	ç	BB	187	╗	EF	239	∩
20	32	SP	54	84	T	88	136	ê	BC	188	╝	F0	240	≡
21	33	!	55	85	U	89	137	ë	BD	189	╜	F1	241	±
22	34	"	56	86	V	8A	138	è	BE	190	╛	F2	242	≥
23	35	#	57	87	W	8B	139	ï	BF	191	┐	F3	243	≤
24	36	$	58	88	X	8C	140	î	C0	192	└	F4	244	⌠
25	37	%	59	89	Y	8D	141	ì	C1	193	┴	F5	245	⌡
26	38	&	5A	90	Z	8E	142	Ä	C2	194	┬	F6	246	÷
27	39	´	5B	91	[	8F	143	Å	C3	195	├	F7	247	≈
28	40	(	5C	92	\	90	144	É	C4	196	─	F8	248	°
29	41	)	5D	93	]	91	145	æ	C5	197	┼	F9	249	•
2A	42	*	5E	94	^	92	146	Æ	C6	198	╞	FA	250	·
2B	43	+	5F	95	_	93	147	ô	C7	199	╟	FB	251	√
2C	44	,	60	96	`	94	148	ö	C8	200	╚	FC	252	ⁿ
2D	45	-	61	97	a	95	149	ò	C9	201	╔	FD	253	²
2E	46	.	62	98	b	96	150	û	CA	202	╩	FE	254	▪
2F	47	/	63	99	c	97	151	ù	CB	203	╦	FF	255	
30	48	0	64	100	d	98	152	ÿ	CC	204	╠			
31	49	1	65	101	e	99	153	Ö	CD	205	═			
32	50	2	66	102	f	9A	154	Ü	CE	206	╬			
33	51	3	67	103	g	9B	155	¢	CF	207	╧			

10.2   **Key codes**

All keys of the IND690 are assigned to numbers so that the keys may be addressed via interfaces.

Key	Number	Key	Number
Key 0	0	Key 🔄	19
Key 1	1	Key →0←	20
…	…	Key →T←	21
Key 9	9	Key PT	22
Decimal point key	10	Key C	23
Function key F1	11	Key ↵	24
Function key F2	12	CODE A key	25
Function key F3	13	CODE B key	26
Function key F4	14	CODE C key	27
Function key F5	15	CODE D key	28
Function key F6	16	CODE E key	29
		CODE F key	30
		Cursor key <	31
		Cursor key >	32
		Cursor key ∧	33
		Cursor key ∨	34

10.3   **Notes on CL handshake**

With the CL handshake 3 types of interface control are possible:
Handshake in receiving direction, in transmitting direction and in both directions.
After switch-on and after each interruption, the IND690 attempts to establish the handshake in both directions.

CL handshake in receiving direction

This type of CL handshake is suitable for data transmission from the IND690 to the computer.

1. The weighing terminal transmits SYN after switch-on.

2. The computer transmits the character ACK after switch-on or after receiving SYN.

3. The weighing terminal then sends the response to a command or to a key actuation after each ACK.

CL handshake in transmission direction

This type of CL handshake is suitable for data transmission from the computer to the IND690.

1. The weighing terminal transmits SYN after switch-on.

2. The computer transmits the character SYN after switch-on or after receiving SYN.

3. The weighing terminal acknowledges the receipt of SYN again with SYN and signals its readiness to receive with ACK.

4. Then the computer can transmit a command after each ACK.

CL handshake in both directions

1. The weighing terminal transmits SYN after switch-on.

2. The computer transmits the character SYN after switch-on or after receiving SYN.

3. The weighing terminal acknowledges the receipt of SYN again with SYN and signals its readiness to receive with ACK.

4. The computer signals its readiness to receive with ACK.

5. During operation the weighing terminal receives data and transmits ACK when it is ready to receive data again.
The computer receives data and transmits ACK when it is ready to receive data again.

10.4 Selection possibilities for the assignment of the digital inputs and outputs

Digital inputs	Assignment	Function
	ON/OFF	switch terminal on or off
	ZERO SET	like (→0←)
	TARE SET	like (→T←)
	ENTER	like ↵
	CLEAR	like (C)
	SCALE	like (⚖)
	SCALE 1 ... SCALE 5	switch over to Scale 1 ... 5
	KBD LOCK	lock/unlock keyboard
	F1 .... F6	like key F1 ... F6
	NOT USED	no function stored

Digital outputs	Assignment	Function
	DELTA BELOW	DeltaTrac below tolerance
	DELTA GOOD	DeltaTrac within tolerance
	DELTA ABOVE	DeltaTrac above tolerance
	STABLE	scale stationary, no movement
	SETPOINT 1 ... SETPOINT 8	Setpoint 1 ... 8 reached or exceeded
	SCALE 1 ... SCALE 5	current scale is Scale 1 ... 5
	GA46 P O	Out of paper GA46
	CMD	toggles after a command triggered via an input has been executed
	RESULT	result of the command execution 0 = correct, 1 = incorrect
	NET	net weight is displayed
	NOT USED	no function stored

10.5 Disposal

In conformance with the European Directive 2002/96 EC on Waste Electrical and Electronic Equipment (WEEE) this device may not be disposed of with domestic waste. This also applies to countries outside the EU, per their specific requirements.

→ Please dispose of this product in accordance with local regulations at the collecting point specified for electrical and electronic equipment.

If you have any questions, please contact the responsible authority or the distributor from which you purchased this device.

Should this device be passed on to other parties (for private or professional use), the content of this regulation must also be related.

Thank you for your contribution to environmental protection.

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nefton

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