Operating instructions

METTLER TOLEDO MultiRange
Application software IND690-Control

METTLER TOLEDO

35.8517 kg

IND690

35.8517 kg

IND690
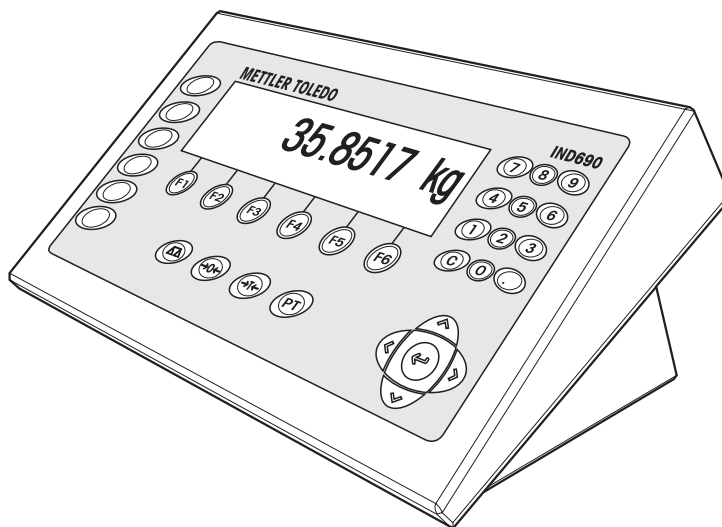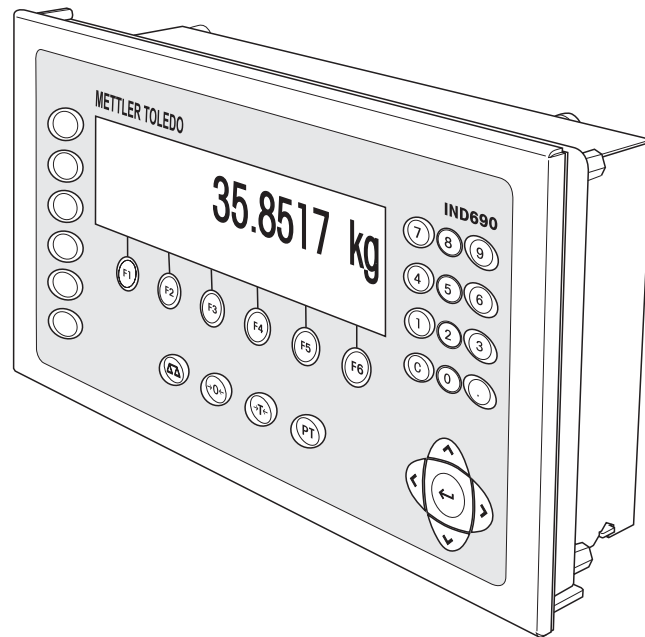
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Contents

1   Applications of IND690-Control

1.1   Documentation

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

These operating instructions describe the operation and configuration of the application software IND690-Control.

The basic information for working with the weighing terminal IND690-… can be found in the operating instructions IND690-Base.

1.2   Introduction

The IND690-Control supports 5 different applications that are selected and set in the master mode: CHECKING, CLASSIFYING, WEIGHING, WEIGHING 1+1 and TARGET TOTALIZING. These applications can be run in the fully automatic or semi-automatic mode. The semi-automatic mode permits remote operation.
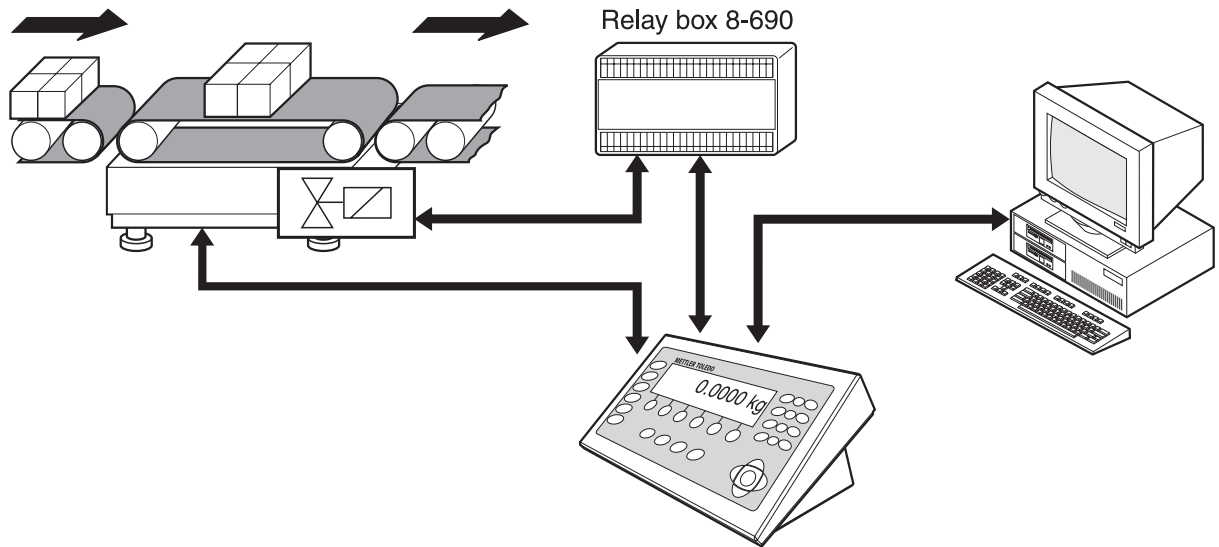
1.3   FULLY AUTOMATIC and SEMI-AUTOMATIC MODE

The fully automatic and semi-automatic modes differ in the manner in which the weighing sample is transported to and from the weighing platform: In the fully automatic mode via an automatic conveyor system, in the semi-automatic mode manually.

1.3.1   Fully automatic mode

The weighing samples are transported onto the conveyor belt of the weighing platform via a supply belt, weighed and transported away at predefined time intervals. The IND690-Control controls the conveyor system via the 8-690 relay box (for instructions on connecting the relay box, see section 6.1).

For the fully automatic mode, the setting FULLY AUTOMATIC MODE must be selected in the OPERATING MODE master mode block.

The conveyor system can be started and stopped as follows:

- manually via foot switch or hand switch,
- via interface commands, see application block 306 in section 3.

1.3.2   Semi-automatic mode

The weighing samples are transported manually onto the weighing platform, e.g. on a monorail-suspension weighing platform, weighed there and then transported away again manually. With a suspension monorail, blocking flaps on the transition to the weighing rail only permit one transport direction. The blocking flaps are controlled by the IND690-Control.

For the semi-automatic mode, the setting SEMI-AUTOMATIC MODE must be selected in the OPERATING MODE master mode block.
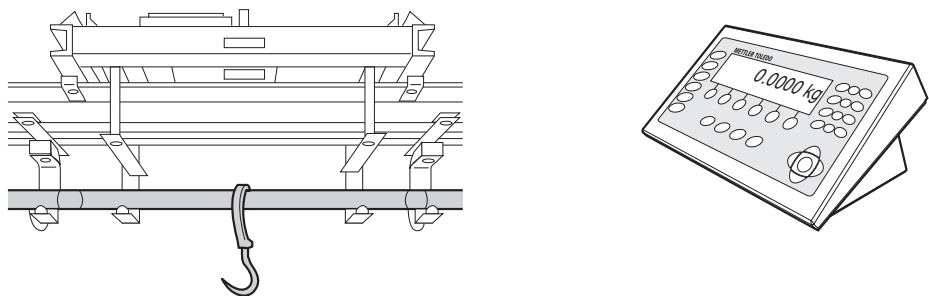
Remote operation   In the semi-automatic mode the IND690-Control can also be remote controlled with "electronic fingers", see section 1.9.

1.4   **CHECKING application**

The IND690-Control checks whether the weight of a weighing sample matches a specified target value with freely definable tolerances.

Prerequisite

The CHECKING application is set in the master mode.

1.4.1   **Function keys**

The function keys of the IND690-Control are assigned the following functions in the CHECKING application:

Fully automatic mode

LIMIT	SUM	ITEM
Specify target values	Display total sum	Set item counter

Semi-automatic mode

LIMIT	SUM	ITEM	CANCEL	MANUAL	PLUS
Specify target values	Display total sum	Set item counter	Cancel last weight value detected	Enter weight value manually	Add weight value to total sum

➜ Select the function by pressing the function key.

Example

➜ Press the ITEM key.
   Then manually enter the start and stop value of the item counter via the keypad.

When the function keys are otherwise allocated

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

CAUTION

Danger of injury when pressing buttons which start and stop the conveyor system or control the flaps!

➜ Before pressing these keys, make sure that no one is in the area of moving system parts.

1.4.2 Specifying target values

Entering numerically
1. Press LIMIT key.
2. Enter target value TARG and confirm with ENTER.
3. Enter upper tolerance TOL+ and confirm with ENTER.
4. Enter lower tolerance TOL– and confirm with ENTER.
5. Specify time after which the conveyor belt is switched off if no stationary weight value could be determined:
   Enter TIMER 1 and confirm with ENTER.
6. Specify relief threshold between 2 weighings:
   Enter ZERO LIMIT and confirm with ENTER.

Notes
- The entry can be corrected one character at a time with the CLEAR key.
- When PASSWORD BLOCK ON is set in the master mode, a personal code must be entered after pressing the LIMIT key.
- The weight unit for entering the target values can be selected with the FUNCTION CHANGE key.

Copying constants
➜ Enter number of target-value memory and press LIMIT key.
   The stored target values are displayed.

Note
When PASSWORD BLOCK ON is set in the master mode, a personal code must be entered after pressing the LIMIT key.

1.4.3 Checking in fully automatic mode

1. Specify target values, see section 1.4.2.
2. Press external START key.

   – The first item is transported onto the weighing platform by the conveyor belt.
   – The display shows the following weight classes.

Class	Weight range	Display
GOOD	Weight value within the tolerances	WITHIN TOLERANCE
TOO LOW	Weight value below tolerance limits	WEIGHT TOO LOW
TOO HIGH	Weight value above tolerance limits	WEIGHT TOO HIGH

   – The weight value is automatically printed.
   – The weighing platform is relieved and the next item is transported onto the weighing platform.

Notes

- The weight values must be greater than the zero limit set in the master mode, see section 2.2.

- The weighing platform must be unloaded below the zero limit between 2 weighings.

Totalizing   The weight values of several items can automatically be totalized. An item counter can also be set. When the item counter reaches its end value, the conveyor belt stops the system automatically.

Prerequisite

AUTO TOTALIZING ON must be set in the master mode.

1. To set the item counter:
    – Press ITEM key.
    – Enter start value and confirm with ENTER.
    – Enter stop value and confirm with ENTER.
    – Start and stop value of item counter are automatically printed.

2. Press external START key.

    – Weighing sample is automatically transported onto weighing platform and weighed.
    – Weight value and number of current item are displayed and automatically printed.
    – Weight value is added to weight sum.
    – Weighing sample is automatically transported away from weighing platform.
    – When item counter has reached its end value, display shows END VALUE REACHED and conveyor system stops automatically.

3. Press SUM key.

    – Total sum is displayed and sum printout is printed.

4. To temporarily save the total sum, press ENTER key.
    – or –
    To delete the total sum, press the CLEAR key.

Notes

When TOLERANCE CHECK ON is set in the master mode,

- only weight values of the class GOOD are totalized.

- the conveyor system stops in the case of weight values outside the tolerances.
  If the weight value is improved by adding to or deducting from the weighing sample so that it lies within the tolerance limits, the conveyor system continues to feed.

1.4.4 Checking in semi-automatic mode

1. Specify target values, see section 1.4.2.

2. Place item on weighing platform.

   – Press PLUS key.
   Display shows weight class:

Class	Weight range	Display
GOOD	Weight value within tolerances	WITHIN TOLERANCE
TOO LOW	Weight value below tolerances	WEIGHT TOO LOW
TOO HIGH	Weight value above tolerances	WEIGHT TOO HIGH

3. Weight value is automatically printed and added to weight sum.

4. Unload weighing platform.

Notes

• The weight values must be greater than the zero limit set in the master mode, see section 2.2.

• The weighing platform must be unloaded below the zero limit between 2 weighings.

Totalizing   An item counter can also be set in addition to totalizing.

1. To set the item counter:
   – Press ITEM key.
   – Enter start value and confirm with ENTER.
   – Enter stop value and confirm with ENTER.
   – Start and stop value of item counter are automatically printed.

2. Transport weighing sample onto weighing platform.

3. Press PLUS key.

   – Weight value and number of current item are displayed and automatically printed.
   – Weight value is added to weight sum.

4. Transport weighing sample off of weighing platform.
   When item counter has reached its end value, display shows END VALUE REACHED.

5. Press SUM key.

   – Total sum is displayed and sum printout is printed.

6. To temporarily save the weight sum, press ENTER key.
   – or –
   To delete the weight sum, press the CLEAR key.

Note
If TOLERANCE CHECK ON is set in the master mode, only weight values of the GOOD class are totalized.

Adding known weight value to sum

1. Press MANUAL key.

2. Add known weight value to sum and confirm with ENTER.

   – Weight value is added to sum.
   – Weight value and number of current item are displayed and automatically printed.

Note

With the CHANGE FUNCTION key the weight unit for entering known weight values can be selected.

Cancelling item

The last item weighed can be cancelled.

1. Leave item on weighing rail or place on rail again.

2. Press CANCEL key.

   – Weight value of item is deleted.
   – Weight value and number of cancelled item are displayed and automatically printed.

Date	21/11/97
Time	17-05-31
Target	0.500 kg
Toler. (+)	0.250 kg
Toler. (−)	0.250 kg
TIMER	3.0
ZERO LIMIT	10
# ALL	9.155 kg
# GOOD	3.380 kg
# TOO LARGE	5.275 kg
# TOO SMALL	0.500 kg
n ALL	16
n ALL	100 % *
n GOOD	6
n GOOD	37.5 % *
n TOO LARGE	5
n TOO LARGE	31.3 % *
n TOO SMALL	5
n TOO SMALL	31.3 % *
X_GOOD	0.563 kg *
X_ALL	0.572 kg *
S_GOOD	0.0510 kg *
S_ALL	0.3920 kg *
MAX	1.095 kg *
MIN	0.100 kg *

Sum print-out

The IND690-Control determines the weighing value and the number of items for all classes. If the SQC FUNCTION ON is set in the master mode, the following variables are also determined and printed out:

• Share in percent in all classes

• Mean value of the class GOOD (X_GOOD)

• Mean value of all classes (X_ALL)

• Standard deviation of the class GOOD (S_GOOD)

• Standard deviation of all classes (S_ALL)

• Maximum weight value (MAX)

• Minimum weight value (MIN)

* Only appears when SQC FUNCTION ON is set in the master mode.

1.4.5 Displaying application-specific information

Information can be displayed with the following key combinations:

Fully automatic mode

INFO, LIMIT	Display current weighing parameters.
INFO, SUM	Display current total sum.
INFO, ITEM	Display item counter.

Semi-automatic mode

INFO, LIMIT	Display current weighing parameters.
INFO, SUM	Display current total sum.
INFO, ITEM	Display item counter.
INFO, CANCEL	Display cancelled item.
INFO, MANUAL	Display manually entered weight values.
INFO, PLUS	Display totalized items.

Note

If several pieces of information are recalled with one key, the display changes automatically after the set DISPLAY DURATION. You can also switch back and forth between these pieces of information with the CLEAR key.

1.5 CLASSIFYING application

The IND690-Control divides the weighing samples into 8 different weight classes.

Prerequisite

The CLASSIFYING application is set in the master mode.

1.5.1 Function keys

The function keys of the IND690-Control are assigned the following functions in the CLASSIFYING application:

Fully automatic mode

LIMIT	SUM	ITEM
Specify limits of weight classes	Display total sum	Set item counter

Semi-automatic mode

LIMIT	SUM	ITEM	CANCEL	MANUAL	PLUS
Specify limits of weight classes	Display total sum	Set item counter	Cancel last weight value detected	Enter weight value manually	Add weight value to total sum

➡ Select the function by pressing the function key.

Example

➡ Press the ITEM key.
Then manually enter the start and stop value of the item counter via the keypad.

When the function keys are otherwise allocated

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

CAUTION

Danger of injury when pressing buttons which start and stop the conveyor system or control the flaps!

➡ Before pressing these keys, make sure that no one is in the area of moving system parts.

1.5.2 Specifying limits

Entering numerically

1. Press LIMIT key.

2. Enter LIMIT 1 … LIMIT 7 consecutively and confirm with ENTER.
   For LIMIT 1 … LIMIT 7 the following must apply:
   LIMIT 1< LIMIT 2 ≤ … ≤ LIMIT 7 ≤ maximum load.

3. Specify time after which the conveyor belt switches off if no stationary weight value could be determined:
   Enter TIMER 1 and confirm with ENTER.

4. Specify relief threshold between 2 weighings:
   Enter ZERO LIMIT and confirm with ENTER.

Notes

- The entry can be corrected one character at a time with the CLEAR key.

- When PASSWORD BLOCK ON is set in the master mode, a personal code must be entered after pressing the LIMIT key.

- The weight unit for entering the limits can be selected with the FUNCTION CHANGE key.

Copying constants

➜ Enter number of limit memory and press LIMIT key. The stored limits are displayed.

Note

When PASSWORD BLOCK ON is set in the master mode, a personal code must be entered after pressing the LIMIT key.

1.5.3 Classifying in fully automatic mode

1. Specify limits, see section 1.5.2.

2. Press external START key.

   – The first item is transported onto the weighing platform by the conveyor belt.
   – The display shows the current weight classes:

Class	Weight range	Display
1	Zero limit ≤ Weight value < Limit 1	LOW LIMIT 1
2	Limit 1 ≤ Weight value < Limit 2	CLASS 2
3	Limit 2 ≤ Weight value < Limit 3	CLASS 3
4	Limit 3 ≤ Weight value < Limit 4	CLASS 4
5	Limit 4 ≤ Weight value < Limit 5	CLASS 5
6	Limit 5 ≤ Weight value < Limit 6	CLASS 6
7	Limit 6 ≤ Weight value < Limit 7	CLASS 7
8	Limit 7 ≤ Weight value < Maximum load	HIGH LIMIT 7

   – The weight value is automatically printed.
   – The weighing platform is relaxed and the next item is transported onto the weighing platform.

Notes

- The weight values must be greater than the zero limit set in the master mode, see section 2.2.

- The weighing platform must be unloaded below the zero limit between 2 weighings.

Totalizing   The weight values of several items can automatically be totalized. An item counter can also be set. When the item counter reaches its end value, the conveyor system stops automatically.

Prerequisite

AUTO TOTALIZING ON is set in the master mode.

1. To set the item counter:

   – Press ITEM key.
   – Enter start value and confirm with ENTER.
   – Enter stop value and confirm with ENTER.
   – Start and stop value of item counter are automatically printed.

2. Press external START key.

   – Weighing sample is automatically transported onto weighing platform and weighed.
   – Weight value and number of current item are displayed and automatically printed.
   – Weight value is added to weight sum.
   – Weighing sample is automatically transported away from weighing platform.
   – When item counter has reached its end value, display shows END VALUE REACHED and conveyor system stops automatically.

3. Press SUM key.
   Weight sum is displayed. Sum printout is printed.

4. To temporarily save the sum, press ENTER key.
   – or –
   To delete the sum, press CLEAR key.

1.5.4   Classifying in semi-automatic mode

1. Specify limits, see section 1.5.2.

2. Place item on weighing platform.

3. Press PLUS key.
   Display shows weight class, see table above.
   Weight value is automatically printed and added to weight sum.

4. Unload weighing platform.

Notes

- The weight values must be greater than the zero limit set in the master mode, see section 2.2.

- The weighing platform must be unloaded below the zero limit between 2 weighings.

Totalizing   An item counter can also be set in addition to totalizing.

1. To set the item counter:
   – Press ITEM key.
   – Enter start value and confirm with ENTER.
   – Enter stop value and confirm with ENTER.
   – Start and stop value of item counter are automatically printed.

2. Transport weighing sample onto weighing platform.

3. Press PLUS key.

   – Weight value and number of current item are displayed and automatically printed.
   – Weight value is added to weight sum.

4. Transport weighing sample off of weighing platform.
   When item counter has reached its end value, display shows END VALUE REACHED.

5. Press SUM key.

    – Weight sum is displayed and automatically printed.
    – Total number of items is displayed and automatically printed.

6. To temporarily save the weight sum, press ENTER key.
    – or –
    To delete the weight sum, press CLEAR key.

Adding known weight value to sum

1. Press MANUAL key.

2. Add known weight value to sum and confirm with ENTER.

    – Weight value is added to sum.
    – Weight value and number of current item are displayed and automatically printed.

Note

With the CHANGE FUNCTION key the weight unit for entering known weight values can be selected.

Cancelling item

The last item weighed can be cancelled.

1. Leave item on weighing rail or place on rail again.

2. Press CANCEL key.

    – Weight value of item is deleted.
    – Weight value and number of cancelled item are displayed and automatically printed.

Sum print-out

The IND690-Control determines the weight value and the item number for all classes. If SQC FUNCTION ON is set in the master mode, the share in percentage of the individual classes is determined and printed.

```
Date           21/11/97
Time           17-05-47

Limit 1        0.500 kg
Limit 2        1.000 kg
Limit 3        1.500 kg
Limit 4        2.000 kg
Limit 5        2.500 kg
Limit 6        3.000 kg
Limit 7        3.500 kg
TIMER               3.0
ZERO LIMIT           10

Net          61.960 kg
# C1          1.600 kg
# C2          9.475 kg

# C8         15.720 kg
n                   31
n C1                 4
n C1            12.9 %   *
n C2                 5
n C2            16.1 %   *

n C8                 4
n C8            12.9 %   *
```

* Only appears when SQC FUNCTION ON is set in the master mode.

1.5.5   Recalling application-specific information

Information can be recalled with the following key combinations:

Fully automatic mode

INFO, LIMIT	Display current weighing parameters.
INFO, SUM	Display current total sum.
INFO, ITEM	Display item counter.

Semi-automatic mode

INFO, LIMIT	Display current weighing parameters.
INFO, SUM	Display current total sum.
INFO, ITEM	Display item counter.
INFO, CANCEL	Display cancelled item.
INFO, MANUAL	Display manually entered weight values.
INFO, PLUS	Display totalized items.

Note

If several pieces of information are recalled with one key, the display changes automatically after the set DISPLAY DURATION. You can also switch back and forth between these pieces of information with the CLEAR key.

1.6   WEIGHING application

The IND690-Control automatically determines the weight value of the weighing sample.

Prerequisite

The WEIGHING application is set in the master mode.

1.6.1   Function keys

The function keys of the IND690-Control are assigned the following functions in the WEIGHING application:

Fully automatic mode

LIMIT	SUM	ITEM
Specify weighing parameters	Display total sum	Set item counter

Semi-automatic mode

	SUM	ITEM	CANCEL	MANUAL	PLUS
	Display total sum	Set item counter	Cancel last weight value detected	Enter weight value manually	Add weight value to total sum

➜ Select the function by pressing the function key.

Example

➜ Press the ITEM key.
Then manually enter the start and stop values of the item counter via the keypad.

When the function keys are otherwise allocated

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

CAUTION

Danger of injury when pressing buttons which start and stop the conveyor system or control the flaps!

➜ Before pressing these keys, make sure that no one is in the area of moving system parts.

1.6.2 Specifying weighing parameters

1. Press LIMIT key.

2. Specify time after which conveyor belt is switched off if it was not possible to determine a stabile weight value:
   Enter TIMER 1 and confirm with ENTER.

3. Specify relief threshold between two weighings:
   Enter ZERO LIMIT and confirm with ENTER.

Notes

- The weighing parameters are only specified in the fully automatic mode.

- The entry can be corrected character by character with the CLEAR key.

- If PASSWORD BLOCK ON is set in the master mode, a password must be entered after pressing the LIMIT key.

- With the CHANGE FUNCTION key the weight unit for entering the ZERO LIMIT can be selected.

- No key printout is possible for the LIMIT key.

1.6.3 Weighing in fully automatic mode

➜ Press external START key.

– Weighing sample is automatically transported onto weighing platform.
– Weight value is displayed and automatically printed.
– Weighing sample is automatically transported away from weighing platform.

Notes

- The weight values must be greater than the zero limit set in the master mode, see section 2.2.

- The weighing platform must be unloaded below the zero limit between two weighings.

Totalizing   The weight values of several items can automatically be totalized. An item counter can also be set. When the item counter reaches its end value, the conveyor system stops automatically.

Prerequisite

AUTO TOTALIZING ON is set in the master mode.

1. To set the item counter:
   – Press ITEM key.
   – Enter start value and confirm with ENTER.
   – Enter stop value and confirm with ENTER.
   – Start and stop values of item counter are automatically printed.

2. Press external START key.

   – Weighing sample is automatically transported onto weighing platform and weighed.
   – Weight value and number of current item are displayed and automatically printed.
   – Weight value is added to weight sum.
   – Weighing sample is automatically transported away from weighing platform.
   – When item counter has reached its end value, display shows END VALUE REACHED and conveyor system stops automatically.

3. Press SUM key.
   Total sum is displayed and sum printout is printed.

4. To temporarily save the total sum, press ENTER key.
   – or –
   To delete the total sum, press the CLEAR key.

1.6.4 Weighing in semi-automatic mode

1. Transport weighing sample onto weighing rail.

2. Press ENTER key.
   Weight value is displayed and automatically printed.

3. Transport weighing sample off of weighing rail.

Notes

- The weight values must be greater than the zero limit set in the master mode, see section 2.2.

- The weighing platform must be unloaded below the zero limit between two weighings.

Totalizing   The weight values of several items can automatically be totalized. An item counter can also be set.

1. To set the item counter:

   – Press ITEM key.
   – Enter start value and confirm with ENTER.
   – Enter stop value and confirm with ENTER.
   – Start and stop value of item counter are automatically printed.

2. Transport weighing sample onto weighing platform.

3. Press PLUS key.

   – Weight value and number of current item are displayed and automatically printed.
   – Weight value is added to weight sum.

4. Transport weighing sample off of weighing platform.
    When item counter has reached its end value, display shows END VALUE REACHED.

5. Press SUM key.

    – Weight sum is displayed and automatically printed.
    – Total number of items is displayed and automatically printed.

6. To temporarily save the weight sum, press ENTER key.
    – or –
    To delete the weight sum, press the CLEAR key.

Adding known weight value to sum

The weight value is entered manually and added to the total sum.

1. Press MANUAL key.

2. Add known weight value to sum and confirm with ENTER.

    – Weight value is added to sum.
    – Weight value and number of current item are displayed and automatically printed.

Note
With the CHANGE FUNCTION key the weight unit for entering known weight values can be selected.

Cancelling item

The last item weighed can be cancelled.

1. Leave item on weighing rail or place on rail again.

2. Press CANCEL key.

    – Weight value of item is deleted.
    – Weight value and number of cancelled item are displayed and automatically printed.

1.6.5   Displaying application-specific information
Information can be displayed with the following key combinations:

Fully automatic mode

INFO, LIMIT	Display current weighing parameters.
INFO, SUM	Display current total sum.
INFO, ITEM	Display item counter.

Semi-automatic mode

INFO, SUM	Display current total sum.
INFO, ITEM	Display item counter.
INFO, CANCEL	Display cancelled item.
INFO, MANUAL	Display manually entered weight values.
INFO, PLUS	Display totalized items.

Note
If several pieces of information are recalled with one key, the display changes automatically after the set DISPLAY DURATION. You can also switch back and forth between these pieces of information with the CLEAR key.

1.7 WEIGHING 1+1 application

The IND690-Control determines the weight value for each of 2 halves and determines the total weight for both halves.

Prerequisite

The WEIGHING 1+1 application is set in the master mode.

1.7.1 Function keys

The function keys of the IND690-Control are assigned the following functions in the WEIGHING 1+1 application:

Fully automatic mode

LIMIT	SUM	ITEM
Specify weighing parameters	Display total sum	Set item counter

Semi-automatic mode

	SUM	ITEM	CANCEL	MANUAL	PLUS
	Display total sum	Set item counter	Cancel last weight value detected	Enter weight value manually	Add weight value to total sum

➜ Select the function by pressing the function key.

Example

➜ Press the ITEM key.
  Then enter the start and stop value of the item counter manually with the keyboard.

If the function keys are assigned other functions

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

CAUTION

Danger of injury when keys are pressed that start and stop the conveyor system or control the flaps.

➜ Before pressing these keys, make sure that no one is near moving system parts.

1.7.2   Specifying weighing parameters

1. Press LIMIT key.

2. Specify time after which conveyor belt is switched off if it was not possible to determine a stabile weight value:
    Enter TIMER 1 and confirm with ENTER.

3. Specify relief threshold between two weighings:
    Enter ZERO LIMIT and confirm with ENTER.

Notes

• The weighing parameters are only specified in the fully automatic mode.

• The entry can be corrected character by character with the CLEAR key.

• If PASSWORD BLOCK ON is set in the master mode, a password must be entered after pressing the LIMIT key.

• With the CHANGE FUNCTION key the weight unit for entering the ZERO LIMIT can be selected.

• No key printout is possible for the LIMIT key.

1.7.3   Weighing two halves in fully automatic mode

➜ Press external START key.

– Both halves are automatically transported onto weighing platform consecutively.
– Weight value and the number of the pair-related item are displayed and printed for each half.
– Total weight of both halves and number of all weighed halves are automatically displayed and printed after each 2nd half.

Notes

• The weight values must be greater than the zero limit set in the master mode, see section 2.2.

• The weighing platform must be unloaded below the zero limit between two weighings.

Totalizing   The weight values of several items can automatically be totalized. An item counter can also be set. When the item counter reaches its end value, the conveyor system stops automatically.

1. To set the item counter:

– Press ITEM key.
– Enter start value and confirm with ENTER.
– Enter stop value and confirm with ENTER.
– Start and stop value of item counter are automatically printed.

2. Press external START key.

   – Weighing sample is automatically transported onto weighing platform.
   – Weight value and number of current item are displayed and automatically printed.
   – Weight value is added to weight sum.
   – Weighing sample is automatically transported away from weighing platform.
   – When item counter has reached its end value, display shows END VALUE REACHED and conveyor system stops automatically.

3. Press SUM key.
   Weight sum is displayed. Sum printout is printed.

4. To temporarily save the sum, press ENTER key.
   – or –
   To delete the sum, press CLEAR key.

1.7.4 Weighing two halves in semi-automatic mode

1. Transport first half onto weighing platform and press PLUS key.
   Weight value of first half and number of pair-related item are displayed and automatically printed.

2. Transport first half off of weighing platform.

3. Transport second half onto weighing platform and press PLUS key.

   – Weight value of second half and number of pair-related item are displayed and automatically printed.
   – Total weight of both halves and number of all halves weighed are automatically displayed and printed.

4. Transport second half off of weighing platform.

Notes

- The weight values must be greater than the zero limit set in the master mode, see section 2.2.

- The weighing platform must be unloaded below the zero limit between two weighings.

Totalizing The weight values of several items can automatically be totalized. An item counter can also be set.

1. To set the item counter:

   – Press ITEM key.
   – Enter start value and confirm with ENTER.
   – Enter stop value and confirm with ENTER.
   – Start and stop values of item counter are automatically printed.

2. Transport weighing sample onto weighing platform.

3. Press PLUS key.

   – Weight value and number of current item are displayed and automatically printed.
   – Weight value is added to weight sum.

4. Transport weighing sample off of weighing platform.
    When item counter has reached its end value, display shows ENDVALUE REACHED.

5. Press SUM key.

    – Weight sum is displayed and automatically printed.
    – Total number of items is displayed and automatically printed.

6. To temporarily save the weight sum, press ENTER key.
    – or –
    To delete the weight sum, press CLEAR key.

Adding known weight value to sum

1. Press MANUAL key.

2. Add known weight value to sum and confirm with ENTER.

    – Weight value is added to sum.
    – Weight value and number of current item are displayed and automatically printed.

Note
With the CHANGE FUNCTION key the weight unit for entering known weight values can be selected.

Cancelling item The last item weighed can be cancelled.

1. Leave item on weighing rail or place on rail again.

2. Press CANCEL key.

    – Weight value of item is deleted.
    – Weight value and number of cancelled item are displayed and automatically printed.

1.7.5 Displaying application-specific information
Information can be displayed with the following key combinations:

Fully automatic mode

INFO, LIMIT	Display current weighing parameters.
INFO, LIMIT	Display current total sum.
INFO, ITEM	Display item counter.

Semi-automatic mode

INFO, LIMIT	Display current total sum.
INFO, ITEM	Display item counter.
INFO, CANCEL	Display cancelled item.
INFO, MANUAL	Display manually entered weight values.
INFO, PLUS	Display totalized items.

1.8 TARGET TOTALIZING application

The weighing samples are weighed and totalized piece by piece until a preset target weight is reached.

Prerequisite

The TARGET TOTALIZING application is set in the master mode.

1.8.1 Function keys
The function keys of the IND690-Control are assigned the following functions in the TARGET TOTALIZING application:

Fully automatic mode

LIMIT	SUM		START	STOP	END
Specify target weight and tolerances	Display and print total sum		Start or continue process	Interrupt process	End process, accept total sum

Semi-automatic mode

LIMIT	SUM	END	CANCEL	MANUAL	PLUS
Specify target weight and tolerances	Display and print total sum	End process, accept total sum	Cancel last recorded weight value	Enter weight value manually and add to total sum	Add weight value to total sum

➜ Select the function by pressing the function key.

Example

➜ Press the LIMIT key.
Then specify the target value and other weighing parameters.

If the function keys are assigned other functions

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

CAUTION
Danger of injury when keys are pressed that start and stop the conveyor system or control the flaps!

➜ Before pressing these keys, make sure that no one is near moving system parts.

1.8.2 Specifying target weight and tolerances

Enter numerically

1. Press LIMIT key.

2. Enter target weight TARGET and confirm with ENTER.

3. Enter upper tolerance TOL(+) and confirm with ENTER.

4. Enter lower tolerance TOL(−) and confirm with ENTER.

Notes

- If IDENTIFICATION is activated in the master mode, one or more identifications CODE … must be entered before the target weight, e.g. an article number for CODE A.

- The entry can be corrected character by character with the CLEAR key.

- If PASSWORD BLOCK ON is set in the master mode, a password must be entered after pressing the LIMIT key.

- With the CHANGE FUNCTION key the weight unit for entering the target values can be selected.

Copying constants

➔ Enter the number of the target memory and press the LIMIT key.
   The saved target values are displayed.

Note

If PASSWORD BLOCK ON is set in the master mode, a password must be entered after pressing the LIMIT key.

1.8.3 Target totalizing in fully automatic mode

1. Press START key.

   – Weighing sample is transported onto weighing platform and weighed.
   – Weight value, current total sum and difference from target weight are displayed.
   – Weighing sample is transported away from weighing platform.
   – When target weight is reached, display shows END VALUE REACHED and weighing system is blocked and refuses any further weighing sample. Sum printout is printed.

2. Press SUM key.

   – Weight sum is displayed and automatically printed.
   – Total number of items is displayed and automatically printed.

3. To temporarily save the weight sum, press ENTER key.
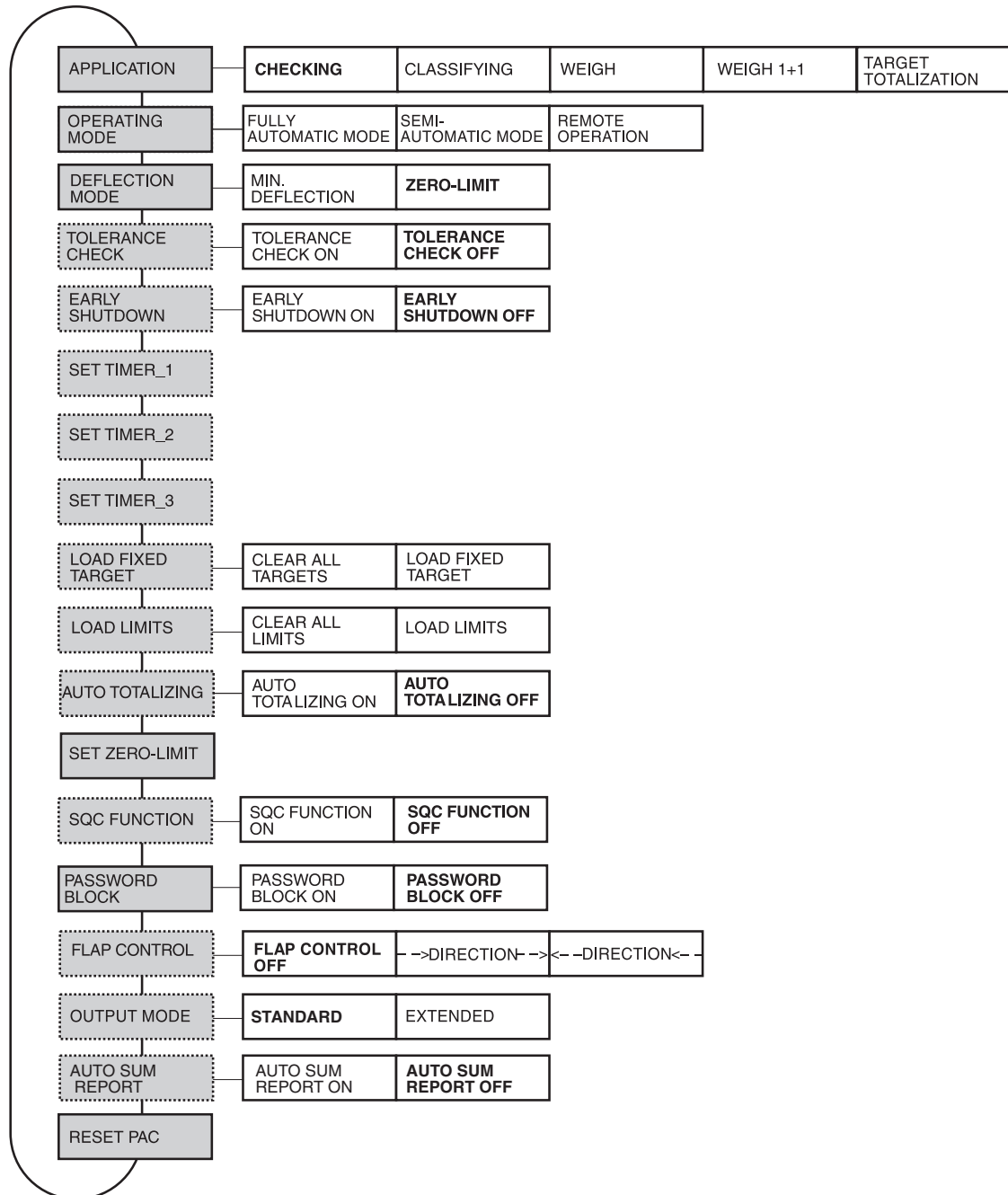   – or –
   To delete the weight sum, press the CLEAR key.

Notes

- The weight values must be greater than the zero limit set in the master mode, see section 2.2.

- The weighing platform must be unloaded below the zero limit between two weighings.

- After deleting the total sum with CLEAR, the settings of the target weight and weighing parameters are automatically displayed.

Interrupting/continuing process

The fully automatic mode can be interrupted and resumed at any time.

➜ Press STOP key;
TARGET TOTALIZING is interrupted.

➜ Press START key;
TARGET TOTALIZING is continued with the next item.

Accepting underweight/ overweight

The current total sum can be accepted, although it is below TOL(−) or above TOL(+).

➜ Press CLOSE key.
The current total sum is accepted and the sum printout is printed.

1.8.4   Target totalizing in semi-automatic mode

1. Transport weighing sample onto weighing platform.
   Weighing sample is weighed. Weight value and total sum accumulated up to this point including difference from target weight are displayed.

2. Press PLUS key.
   Current weight value is added to sum, and current total sum and difference from target weight are displayed.
   – or –
   Press ENTER key.
   Weight value is automatically printed.

3. Transport weighing sample off of weighing rail.
   If target weight is reached, display shows END VALUE REACHED and weighing system is blocked and refuses any further weighing sample. Sum printout is printed.

4. Press SUM key.

   – Weight sum is displayed and automatically printed.
   – Total number of items is displayed and automatically printed.

5. To temporarily save the weight sum, press ENTER key.
   – or –
   To delete the weight sum, press the CLEAR key.

Notes

- The weight values must be greater than the zero limit set in the master mode, see section 2.2.

- The weighing platform must be unloaded below the zero limit between two weighings.

- After deleting the total sum with CLEAR, the settings of the target weight and weighing parameters are automatically displayed.

Accepting underweight/ overweight

The current weight is to be accepted, although it is below TOL(−) or above TOL(+).

→ Press CLOSE key.
   The current total sum is accepted and the sum printout is printed.

Adding known weight value to sum

1. Press MANUAL key.

2. Enter known weight value and confirm with ENTER.

   – Weight value is added to sum.
   – Weight value and number of current item are displayed and automatically printed.

Note

With the CHANGE FUNCTION key the weight unit for entering known weight values can be selected.

Cancelling item

The last item weighed can be cancelled.

1. Leave item on weighing rail or place on rail again.

2. Press CANCEL key.

   – Weight value of item is deleted.
   – Weight value and number of cancelled item are displayed and automatically printed.

Sum printout

The sum printout specifies the accumulated total sum, the number of items weighed, the average weight value and the mean difference from the average weight value.

1.8.5   Displaying application-specific information
Information can be displayed with the following key combinations:

Fully automatic mode   INFO, LIMIT   Display current weighing parameters.

INFO, SUM   Display current total sum.

Semi-automatic mode   INFO, LIMIT   Display cancelled items.

INFO, SUM   Display current total sum.

INFO, CANCEL   Display cancelled item.

INFO, MANUAL   Display manually entered weight values.

INFO, PLUS   Display totalized items.

Note

If several pieces of information are displayed with one key, the display automatically changes after the set DISPLAY DURATION. It is also possible to switch between these pieces of information with the CLEAR key.

1.9   REMOTE OPERATION application

The IND690-Control is remote-controlled via "electronic fingers" which replace the keys ENTER, PLUS and the key sequences SUM, ENTER and SUM, CLEAR on the IND690-Control. With the IND690-Control the weight values can be determined or weight sums calculated.
The "electronic fingers" are actuated with external keys or interface commands.

Prerequisite

The REMOTE OPERATION application is set in the master mode.

Function keys   The function keys of the IND690-Control are not assigned in the REMOTE OPERATION application.

1.9.1   Weighing

In REMOTE OPERATION a differentiation must be made between individual weighing and totalizing.

Individual weighing   1. Transport weighing sample onto the scale.

2. Actuate electronic finger for ENTER key.
    The weight value is automatically printed.

Totalizing   1. Transport weighing sample onto the scale and actuate electronic finger for PLUS key.
    The weight value is added to the total sum.

2. To print out and temporarily save the sum:
    Press electronic finger for SUM, ENTER key sequence.
    – or –
    To print out and delete the sum:
    Press electronic finger for SUM, CLEAR key sequence.

Notes

• The weight values must be greater than the zero limit set in the master mode, see section 2.2.

• Between 2 weighings the weighing platform must be relieved below the zero limit.

2 Settings in the master mode

2.1 Overview of the PAC master mode block

In this block the following system settings can be carried out:

APPLICATION	**CHECKING**	CLASSIFYING	WEIGH	WEIGH 1+1	TARGET TOTALIZATION
OPERATING MODE	FULLY AUTOMATIC MODE	SEMI-AUTOMATIC MODE	REMOTE OPERATION		
DEFLECTION MODE	MIN. DEFLECTION	**ZERO-LIMIT**			
TOLERANCE CHECK	TOLERANCE CHECK ON	**TOLERANCE CHECK OFF**			
EARLY SHUTDOWN	EARLY SHUTDOWN ON	**EARLY SHUTDOWN OFF**			
SET TIMER_1					
SET TIMER_2					
SET TIMER_3					
LOAD FIXED TARGET	CLEAR ALL TARGETS	LOAD FIXED TARGET			
LOAD LIMITS	CLEAR ALL LIMITS	LOAD LIMITS			
AUTO TOTALIZING	AUTO TOTALIZING ON	**AUTO TOTALIZING OFF**			
SET ZERO-LIMIT					
SQC FUNCTION	SQC FUNCTION ON	**SQC FUNCTION OFF**			
PASSWORD BLOCK	PASSWORD BLOCK ON	**PASSWORD BLOCK OFF**			
FLAP CONTROL	**FLAP CONTROL OFF**	– –>DIRECTION– –>	<– –DIRECTION<– –		
OUTPUT MODE	**STANDARD**	EXTENDED			
AUTO SUM REPORT	AUTO SUM REPORT ON	**AUTO SUM REPORT OFF**			
RESET PAC					

Legend
- Blocks on a **grey** background are described in detail in the following.
- Factory settings are shown in **bold** print.
- Blocks which only appear under certain conditions appear with a **dotted outline**.

Depending on the application selected, the following settings must be carried out:

CHECKING	CLASSIFYING	WEIGH	WEIGH 1 + 1	TARGET TOTALIZING
DEFLECTION MODE	DEFLECTION MODE	DEFLECTION MODE	DEFLECTION MODE	DEFLECTION MODE
TOLERANCE CHECK				
EARLY SHUTDOWN	EARLY SHUTDOWN			
SET TIMER_1	SET TIMER_1	SET TIMER_1	SET TIMER_1	SET TIMER_1
		SET TIMER_2		
SET TIMER_3	SET TIMER_3	SET TIMER_3	SET TIMER_3	SET TIMER_3
LOAD FIXED TARGET				LOAD FIXED TARGET
	LOAD LIMITS			
AUTO-TOTALIZING	AUTO-TOTALIZING	AUTO-TOTALIZING		
SET ZERO-LIMIT	SET ZERO-LIMIT	SET ZERO-LIMIT	SET ZERO-LIMIT	SET ZERO-LIMIT
SQC FUNCTION	SQC FUNCTION			
PASSWORD BLOCK	PASSWORD BLOCK	PASSWORD BLOCK	PASSWORD BLOCK	PASSWORD BLOCK
		FLAP CONTROL	FLAP CONTROL	
OUTPUT MODE	OUTPUT MODE		OUTPUT MODE	
AUTO SUM REPORT	AUTO SUM REPORT	AUTO SUM REPORT	AUTO SUM REPORT	

Legend • Blocks on a **grey** background appear only with fully automatic mode.

• Blocks with a **dotted outline** appear only with semi-automatic mode.

2.2 Settings in the PAC master mode block

APPLICATION	Select application
CHECKING	The IND690-Control checks whether the weight corresponds to a specified target value with freely definable tolerances (factory setting). Other entries: 1. Enter target value TARG and confirm with ENTER: TARGET VALUE < Maximum load. To accept the value displayed, press ENTER key. 2. Enter upper tolerance TOL(+) and confirm with ENTER: TARG + TOL(+) ≤ Maximum load. To accept the value displayed, press ENTER key. 3. Enter lower tolerance TOL(−) and confirm with ENTER: TOL(−) < TARG. To accept the value displayed, press ENTER key. 4. ENTER TIME for SET TIMER 1 block and confirm with ENTER: 0.1 … 99.9 seconds. To accept the value displayed, press ENTER key. 5. SET LIMIT for SET ZERO LIMIT block and confirm with ENTER: 0 … 3000 digit. To accept the value displayed, press ENTER key.
CLASSIFYING	The weighing sample is automatically transported onto the weighing platform. The IND690-Control classifies the weighing sample in 8 different weight classes. Other entries: 1. Enter limits LIMIT 1 … LIMIT 7 and confirm with ENTER: LIMIT 1< LIMIT 2 ≤ … ≤ LIMIT 7 ≤ Maximum load. 2. ENTER TIME for SET TIMER 1 block and confirm with ENTER: 0.1 … 99.9 seconds. To accept the value displayed, press ENTER key. 3. ENTER LIMIT for SET ZERO LIMIT block and confirm with ENTER: 0 … 3000 digit. To accept the value displayed, press ENTER key.
WEIGHING	The weighing sample is weighed. Additional entries: 1. Enter DURATION for SET TIMER 1 block and confirm with ENTER: 0.1 … 99.9 seconds. To adopt the displayed value, press the ENTER key. 2. Enter LIMIT for SET ZERO LIMIT block and confirm with ENTER: 0 … 3000 digit. To adopt the displayed value, press the ENTER key.

APPLICATION	Select application
WEIGHING 1+1	Two consecutive weighing samples are weighed and added to a weighing sample. AUTO TOTALIZING ON is automatically set. Additional entries: 1. Enter DURATION for SET TIMER 1 block and confirm with ENTER: 0.1 … 99.9 seconds. To adopt the displayed value, press the ENTER key. 2. Enter LIMIT for SET ZERO LIMIT block and confirm with ENTER: 0 … 3000 digit. To adopt the displayed value, press the ENTER key.
TARGET TOTALIZING	Several items are weighed and totalized until a specified target weight is reached. Additional entries: 1. Enter DURATION for SET TIMER 1 block and confirm with ENTER: 0.1 … 99.9 seconds. To adopt the displayed value, press the ENTER key. 2. Enter LIMIT for SET ZERO LIMIT block and confirm with ENTER: 0 … 3000 digit. To adopt the displayed value, press the ENTER key.
IDENTIFICATION	Specify for which of the identifications CODE A - CODE F an entry is requested before the target values can be entered: CODE … ON Entry requested CODE … OFF Entry not required Factory setting: For all four keys CODE … OFF.
REPORT STYLE	Specify which pieces of information are to be printed during the weighing process: STD After the target weight is reached, the cumulative weight sum, the number of items weighed, the average weight value and the mean difference from the average weight value are printed. EXTENDED The weight value and the current weight sum are also printed for each weighed item. Factory setting: STD
WARNING LEVEL	Enter at what percentage of the target weight the terminal is to transmit a warning signal. Factory setting: 90 %
DELTATRAC	Specifies whether the DeltaTrac is used: DELTATRAC ON The DeltaTrac appears after the first item is weighed DELTATRAC OFF The difference between the weight sum and target value is show in the display at the upper left The upper tolerance TOL(+) is used as the tolerance for the DeltaTrac. If TOL(+) is equal to 0.000 kg, 1 % of the target weight is set as the tolerance. Factory setting: DELTATRAC OFF

OPERATING MODE	Select operating mode
FULLY AUTOMATIC MODE	The weighing sample is automatically transported onto the weighing platform and weighed.
SEMI-AUTOMATIC MODE	The weighing sample is manually transported onto the weighing platform and weighed.
REMOTE OPERATION	The IND690-Control is remote-controlled via "electronic fingers". The electronic fingers are triggered with external keys, see section 6.1, or with commands via the serial port, see section 3.

DEFLECTION MODE	Set deflection mode
	Factory setting: ZERO-LIMIT
MIN. DEFLECTION	With manual loading the weight value between 2 weighings must change by at least 10 digit. Output OUT 1 for the conveyor belt is set to LOW and then not changed, see section 6.1.
ZERO-LIMIT	With automatic loading with the conveyor belt, the weighing platform must be relieved under the zero limit between 2 weighings, see SET ZERO-LIMIT block. Output OUT 1 for the conveyor belt is set to HIGH and controlled by the IND690-Control, see section 6.1.

TOLERANCE CHECK	Switch tolerance check on or off
	Only for the applications CHECKING and TARGET TOTALIZING. When TOLERANCE CHECK ON is set, the conveyor system stops in the case of weight values outside the tolerances. If the weight value comes to rest within the tolerances by adding or removing, the conveyor system continues to transport. Factory setting: TOLERANCE CHECK OFF
Comment	When AUTO TOTALIZING ON is set, only weight values within the tolerances are totalized.

EARLY SHUTDOWN	Switch early shutdown on or off
	Only for the applications CHECKING and CLASSIFYING. When EARLY SHUTDOWN ON is set, the output signals WEIGHT TOO HIGH, WEIGHT TOO LOW or CLASS 2 … CLASS 8 are reset immediately after the weighing platform is relieved. When EARLY SHUTDOWN OFF is set, the signals are retained until the next weight value is determined. Factory setting: EARLY SHUTDOWN OFF

SET TIMER_1	Enter time within which a stationary weight value must be determined
	Only for FULLY AUTOMATIC MODE. If no stationary weight value is determined within the TIME, the conveyor systems stops until the weighing platform has determined a stabile weight value.
TIME	Possible setting: 0.1 … 99.9 seconds (Factory setting: 3.0)
Comment	For the applications CHECKING and CLASSIFYING the TIME can also be specified in the APPLICATION block.

SET TIMER_2	Enter time when weighing 2 halves
	Only with the application WEIGHING in FULLY AUTOMATIC MODE When weighing 2 halves, 2 consecutive weighings are combined to form a total weighing. When the weighing sample is fed in consecutively in one transport direction, the TIME specifies how long the weighing platform will wait for the second half after the first loading without a print-out being triggered.
TIME	Possible setting: 0.0 … 99.9 seconds (Factory setting: 0.0)
Comment	The first half may not leave the weighing platform until Timer 1 has run out and a stationary weighing value has been determined.

SET TIMER_3	Enter time between start and stop of an infeed conveyor so that only one weighing sample is on the weighing platform at any given time
	Only with FULLY AUTOMATIC MODE. The infeed conveyor is controlled as follows: • The infeed conveyor transports the weighing sample onto the running conveyor belt of the weighing platform. • When the conveyor belt is loaded by the zero limit, Timer 3 is started. After Timer 3 runs out, the infeed conveyor is stopped. • The conveyor belt feeds the weighing sample onto the weighing platform. • When the weighing platform is relieved below the zero limit, the infeed conveyor is started again.
TIME	Possible settings: 0.0 … 99.9 seconds (Factory setting: 99.9)

LOAD FIXED TARGET	**Store constant target values in target memories safe from power failures**
	Only for the applications CHECKING and TARGET TOTALIZING.
LOAD FIXED TARGET	1. Enter memory number TARGET NO: 1… 999.
	2. Enter article designation NAME, e.g. M8 BOLT.
	3. Enter target weight TARG: TARG < Maximum load.
	4. Enter upper tolerance TOL(+): TARG + TOL(+) ≤ Maximum load.
	5. Enter lower tolerance TOL(−): TOL(−) < TARG.
	6. Enter TIME for Timer 1.
	7. Enter TIME for zero-limit.
	8. To load additional constant target values, repeat the first 7 steps.
	9. End entry: Confirm memory number with ENTER without making entry.
CLEAR ALL TARGETS	Clear all target memories.

LOAD LIMITS	**Store constant limits in limit memories safe from power failures**
	Only with the application CLASSIFYING.
LOAD LIMITS	1. Enter memory number LIMIT FIX NO. : 1… 249.
	2. Enter article designation NAME, e.g. M8 BOLT.
	3. Enter limits LIMIT 1 … 7: LIMIT 1< LIMIT 2 ≤ … ≤ LIMIT 7 ≤ Maximum load
	4. Enter TIME for Timer 1.
	5. Enter TIME for zero-limit.
	6. To load additional constant limits, repeat the first 5 steps.
	7. End entry: Confirm memory number directly with ENTER.
CLEAR ALL LIMITS	Delete all limit memories.

AUTO TOTALIZING	**Switch automatic totalizing on or off**
	Can be set for the applications CHECKING, CLASSIFYING and WEIGHING for FULLY AUTOMATIC MODE. Factory setting: AUTO TOTALIZING OFF

SET ZERO-LIMIT	**Set zero limit for relief checking**
	The weighing platform must be relieved between 2 weighings under the LIMIT. Only those weighings are recorded with weight values above the LIMIT.
LIMIT	Possible values: 0 … 3000 digit (Factory setting: 10)
Comment	With the applications CHECKING and CLASSIFYING the LIMIT can also be specified in the APPLICATION block.

SQC FUNCTION	Switch statistical quality check on or off
	Only with the applications CLASSIFYING and CHECKING. When SQC FUNCTION ON is set, the IND690-Control determines the following values in addition to the weight value and the absolute item number of the individual classes: • CHECKING: Relative item number of all classes, mean value and standard deviation of the class GOOD, mean value and standard deviation of all classes, minimum and maximum weight value • CLASSIFYING: Relative item number of all classes Factory setting: SQC FUNCTION OFF

PASSWORD BLOCK	Switch password block for LIMIT key on or off
	When PASSWORD BLOCK ON is set, the LIMIT key is protected with the same personal code as the access to the master mode. Factory setting: PASSWORD BLOCK OFF

FLAP CONTROL	Specify transport direction		
	Only with the applications WEIGH and WEIGH 1+1 for the SEMI-AUTOMATIC MODE. The transitions of the tubular track system to the weighing rail of the monorail-suspension weighing platform are equipped with locking flaps for discharge and infeed. These are controlled as follows:		
		Discharge	Infeed
	Basic setting	closed	open
	Weighing sample on weighing rail	closed	open
	ENTER and SUM keys pressed	closed	closed
	Weighing ended	open	closed
	Weighing platform relieved	closed	open
FLAP CONTROL OFF	No locking flaps active		
– –> DIRECTION – –>	Set direction – –>		
<– – DIRECTION <– –	Set direction <– –		

OUTPUT MODE	Set assignment of outputs to relay box	
	Adjustable only for CHECKING and CLASSIFYING application in the SEMI-AUTOMATIC MODE.	
STANDARD		CHECKING application	CLASSIFYING application
	Output1	Conveyor belt	not assigned
	Output2	Scale1 + Weight value too high	Class 2
	Output3	Scale1 + Weight value too low	Class 3
	Output4	Scale2 + Weight value too high	Class 4
	Output5	Scale2 + Weight value too low	Class 5
	Output6	Scale3 + Weight value too high	Class 6
	Output7	Scale3 + Weight value too low	Class 7
	Output8	Infeed belt	greater than Class 7
EXTENDED		CHECKING application	CLASSIFYING application
	Output1	Conveyor belt	less than Limit 1
	Output2	Weight value too high	Class 2
	Output3	Weight value good	Class 3
	Output4	Weight value too low	Class 4
	Output5	Scale1	Class 5
	Output6	Scale2	Class 6
	Output7	Scale3	Class 7
	Output8	Infeed belt	greater than Class 7

AUTO SUM REPORT	Switch sum report on or off
	If AUTO SUM REPORT ON is selected, the message ENDVALUE REACHED appears briefly after the last item has been weighed and the scale unloaded. The report is then printed automatically for the SUM key. Loading a new weight starts a new weighing cycle automatically. Factory setting: AUTO SUM REPORT OFF

RESET PAC	Reset functions to factory setting	
	Block	**Factory setting**
	APPLICATION	Checking
	MODE	Fully automatic mode
	DEFLECTION MODE	Zero-limit
	TOLERANCE CHECK	off
	EARLY SHUTDOWN	off
	SET TIMER_1	3.0
	SET TIMER_3	99.9
	AUTO TOTALIZING	off
	SET ZERO-LIMIT	10
	SQC FUNCTION	off
	PASSWORD BLOCK	off
	FLAP CONTROL	off
	OUTPUT MODE	Standard

3 Application blocks

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 SICS conventions, see Operating instructions for IND690-Base weighing terminal.

No.	Content	Format	
301	Pac version	Response:	`A,B,_ IND690-CONTROL_V1.xx_`
302	Program number	Response:	`A,B,_ IP67-0-Vxxx_`
304	Manual entry (MAN key)	Response:	`A,B,_ Weight value _ Unit`
		Comment:	Only with SEMI-AUTOMATIC MODE
306	With FULLY AUTOMATIC MODE: External keys With SEMI-AUTOMATIC MODE: Keys for the electronic finger	Response:	`A,B,_ $,$,0,5,,,1,0,,,1,5,,,2,4,,,` `2,5,,,2,6`

		Write:	FULLY AUTOMATIC MODE:
			`A,W,3,0,6,_,$,$,0,5`
			`A,W,3,0,6,_,$,$,1,5`
			`A,W,3,0,6,_,$,$,2,5`
			`A,W,3,0,6,_,$,$,2,6`
			
			SEMI-AUTOMATIC MODE:
			`A,W,3,0,6,_,$,$,0,5`
			`A,W,3,0,6,_,$,$,1,5`
			`A,W,3,0,6,_,$,$,2,4`
			`A,W,3,0,6,_,$,$,1,0`

		Remark:	Assignment between numbers and keys/key sequences: 05: SUM, ENTER key sequence 10: PLUS key 15: SUM, CLEAR key sequence 24: ENTER key 25: External START key 26: External STOP key
307	Number of items when weighing 2 halves	Response:	`A,B,_ Number_4`
		Comment:	Only with application WEIGH 1+1
308	Sum when weighing 2 halves	Response:	`A,B,_ Weight value _ Unit`
		Comment:	Only with application WEIGH 1+1

No.	Content	Format		
309	SQC function	Response:	`A B _` Mean value X_GOOD (weight value) `_` Unit `_ _`	
			Mean value X_ALL (weight value) `_` Unit `_ _`	
			Standard deviat. S_GOOD (weight value) `_` Unit `_ _`	
			Standard deviat. S_ALL (weight value) `_` Unit `_ _`	
			Maximum MAX (weight value) `_` Unit `_ _`	
			Minimum MIN (weight value) `_` Unit	
		Comment:	Only with application CHECKING	
310	Item counter	Response:	`A B _` Number_4	
311	Start value of item counter (ITEM key)	Response: Write: Comment:	`A B _` Number_4 `A W 3 1 1 _` Number_4 Only with applications CHECKING, CLASSIFYING, WEIGH and WEIGH 1+1	
312	Stop value of item counter (ITEM key)	Response: Write: Comment:	`A B _` Number_4 `A W 3 1 2 _` Number_4 Only with applications CHECKING, CLASSIFYING, WEIGH and WEIGH 1+1	
313	Sum of net weight (SUM key)	Response:	`A B _` Weight value `_` Unit	
314	Cancelled value (CANC key)	Response: Comment:	`A B _` Weight value `_` Unit Only with SEMI-AUTOMATIC MODE	
315_001 … 315_004	Sum weighing platform 1 … weighing platform 4	Response:	`A B _` Weight value `_` Unit	
318_001 … 318_006	Identification data Code A … Code F	Response: Write: Comment:	`A B _` Name (text_20) `_ _` Identification (text_20) `A W 3 x x _` Name (text_20) `$ $` Identification (text_20) xx = 18_001 … 18_006; corresponds to the application blocks 094 … 099	
318 … 321	Identification data Code A … Code D	Response: Write: Comment:	equal to 318_001 equal to 318_001 xx = 18 … 21; corresponds to the application blocks 094 … 097	
322	Sum of weight class GOOD (within the tolerance)	Response: Comment:	`A B _` Weight value `_` Unit Only with application CHECKING	
323	Sum of weight class TOO LOW (below the tolerance)	Response: Comment:	`A B _` Weight value `_` Unit Only with application CHECKING	
324	Sum of weight class TOO HIGH (above the tolerance)	Response: Comment:	`A B _` Weight value `_` Unit Only with application CHECKING	

No.	Content	Format
325	Sum of weight classes TOO HIGH and TOO LOW (outside the tolerance)	Response: `A͵B` _ `Weight value` _ `Unit` Comment: Only with application CHECKING
326	Sum of weight classes GOOD, TOO HIGH and TOO LOW	Response: `A͵B` _ `Weight value` _ `Unit` Comment: Only with application CHECKING
327	Items of weight class GOOD (within the tolerance)	Response: `A͵B` _ `Number (number_4)` _͵_ `share in percent` _ `%`͵_͵_ Comment: Only with application CHECKING The share in percent only comes back when SQC FUNCTION ON is set in the master mode. Data format of share in percent: max. 4 characters incl. decimal point, right-justified.
328	Items of weight class TOO LOW (below the tolerance)	Response: `A͵B` _ `Number (number_4)` _͵_ `share in percent` _ `%`͵_͵_ Comment: Only with application CHECKING The share in percent only comes back when SQC FUNCTION ON is set in the master mode. Data format of share in percent: max. 4 characters incl. decimal point, right-justified.
329	Items of weight class TOO HIGH (above the tolerance)	Response: `A͵B` _ `Number (number_4)` _͵_ `share in percent` _ `%`͵_͵_ Comment: Only with application CHECKING The share in percent only comes back when SQC FUNCTION ON is set in the master mode. Data format of share in percent: max. 4 characters incl. decimal point, right-justified.
330	Items of weight classes TOO HIGH and TOO LOW (outside the tolerance)	Response: `A͵B` _ `Number (number_4)` _͵_ `share in percent` _ `%`͵_͵_ Comment: Only with application CHECKING The share in percent only comes back when SQC FUNCTION ON is set in the master mode. Data format of share in percent: max. 4 characters incl. decimal point, right-justified.
331	Items of weight classes GOOD, TOO HIGH and TOO LOW	Response: `A͵B` _ `Number (number_4)` _͵_ `share in percent` _ `%`͵_͵_ Comment: Only with application CHECKING The share in percent only comes back when SQC FUNCTION ON is set in the master mode. Data format of share in percent: max. 4 characters incl. decimal point, right-justified.

No.	Content	Format
332	Current target values	**Response:** `A B _` | Name (text_20) `_ _` Target weight (weight value) `_` | Unit | `_ _` Tolerance(+) (weight value) `_` | Unit | `_ _` Tolerance(−) (weight value) `_` | Unit | `_ _` Timer 1 (number_4) `_ _` Zero limit (number_4) The name only comes back when the target values where loaded from a named memory. **Write:** `A W 3 x x _` | Target weight (weight value) | `_` | Unit | `$ $` Tolerance (+) (weight value) \| `_` \| Unit \| `$ $` Tolerance (−) (weight value) \| `_` \| Unit \| `$ $` Timer 1 (number_4) `$ $` Zero limit (number_4) **Comment:** xx = 32; only for applications CHECKING and TARGET TOTALIZING
333_001 … 333_999	Target-value memory 1 … 999	**Response:** equal to 332 **Write:** `A W 3 x x _` | Name (text_20) `_ _` Target weight (weight value) `_` | Unit | `_ _` Tolerance(+) (weight value) | `_` | Unit | `_ _` Tolerance(−) (weight value) | `_` | Unit | `_ _` Timer 1 (number_4) `_ _` Zero limit (number_4) **Comment:** xx = 33_001 … 33_999
333 … 357	Target-value memory 1 … 25	**Response:** equal to 332 **Write:** equal to 332 **Comment:** xx = 33 … 57

No.	Content	Format	
358	Current limits	Response:	A B _ | Name (text_20) | _ ˌ _ Limit 1 (weight value) | _ | Unit | _ ˌ _ Limit 2 (weight value) | _ | Unit | _ ˌ _ Limit 3 (weight value) | _ | Unit | _ ˌ _ Limit 4 (weight value) | _ | Unit | _ ˌ _ Limit 5 (weight value) | _ | Unit | _ ˌ _ Limit 6 (weight value) | _ | Unit | _ ˌ _ Limit 7 (weight value) | _ | Unit | _ ˌ _ Timer 1 (number_4) | _ ˌ _ Zero limit (number_4) The name only comes back when the target values were loaded from a named memory.
		Write:	A W 3 x x | _ | Limit 1 (weight value) | _ | Unit | \$ ˌ \$ Limit 2 (weight value) | _ | Unit | \$ ˌ \$ Limit 3 (weight value) | _ | Unit | \$ ˌ \$ Limit 4 (weight value) | _ | Unit | \$ ˌ \$ Limit 5 (weight value) | _ | Unit | \$ ˌ \$ Limit 6 (weight value) | _ | Unit | \$ ˌ \$ Limit 7 (weight value) | _ | Unit | \$ ˌ \$ Timer 1 (number_4) | \$ ˌ \$ Zero limit (number_4)
		Comment:	xx = 58; only with application CLASSIFYING
359_001 … 359_249	Limit memory 1 … 249	Response: Write:	equal to 358 A W 3 x x | _ | Name (text_20) | _ ˌ _ Limit 1 (weight value) | _ | Unit | _ ˌ _ Limit 2 (weight value) | _ | Unit | _ ˌ _ Limit 3 (weight value) | _ | Unit | _ ˌ _ Limit 4 (weight value) | _ | Unit | _ ˌ _ Limit 5 (weight value) | _ | Unit | _ ˌ _ Limit 6 (weight value) | _ | Unit | _ ˌ _ Limit 7 (weight value) | _ | Unit | _ ˌ _ Timer 1 (number_4) | _ ˌ _ Zero limit (number_4)
		Comment:	xx = 59_001 … 59_249
359 … 383	Limit memory 1 … 25	Response: Write: Comment:	equal to 358 equal to 359_001 xx = 59 … 83; only with application CLASSIFYING

No.	Content	Format	
384 ... 391	Sum class 1 ... class 8	Response: Comment:	`A|B` `_` `Weight value` `_` `Unit` Only with application CLASSIFYING
392 ... 399	Items class 1 ... class 8	Response: Comment:	`A|B` `_` `Number_4` `_|_` `Share in percent` `_` `%|_|_` Only with application CLASSIFYING The share in percent only comes back when SQC FUNCTION ON is set in the master mode. Data format of share in percent: 4 characters incl. decimal point, right-justified.

4 What to do if …?

| Error / Display	Possible causes	Remedy
ENTER TARGET VALUE!	• No target value, tolerance (+) and tolerance (−) exist	➜ Specify target values, see section 1.4.2
ENTER LIMIT!	• No limits exist	➜ Specify limits, see section 1.5.2
TIMER 2 TOO LARGE	• Timer 2 larger than timer 1	➜ Set timer 2 in the master mode: timer 2 < timer 1
TARGET V. TOO LARGE	• Target value exceeds maximum load of weighing platform	➜ Enter new target value with target value + 2 d < maximum load
LIMIT_PLUS TOO LARGE	• Sum of target value + tolerance (+) exceeds maximum load of weighing platform	➜ Select tolerance (+) so that target value + tolerance (+) < maximum load
LIMIT_MIN. TOO SMALL	• Target value minus tolerance (−) drops below zero	➜ Select tolerance (−) so that target value − tolerance (−) > zero
LIMIT TOO LARGE	• Current limit exceeds maximum load of weighing platform	➜ Select lower limits: limit 1< limit 2 ≤ … ≤ limit 7 ≤ maximum load
LIMIT TOO SMALL	• Last limit entered is lower than previous one	➜ Enter limits in increasing order: limit 1< limit 2 ≤ … ≤ limit 7 ≤ maximum load
NOT USED	• No valid data in recalled memory	➜ Load memory in the master mode

5 Technical data

Control functions	
Checking	Classification of weighing sample in 3 weight classes: good, too low, too high
Classifying	Classification of the weighing sample in 8 weight classes
Weighing	Weigh weighing sample
Weighing 1+1	Weigh two halves and calculate total weight
Target totalizing	Weigh weighing samples piece by piece and totalize up to target weight
Remote operation	Remote control of weighing platform via external switches or computers
Memory	999 fixed target memories and 249 fixed limit memories
Item counter	Up to 9,999, start and stop value adjustable
Totalizing	Storage of net sum, acceptable sum, sum too low, sum too high, poor sum, gross sum, class 1 sum … class 8 sum, total sum; protected against power failures
Sum memory	Capacity of up to 8 places including decimal point

6   Appendix

6.1   Connection diagram and terminal assignment of 8-690 relay box

To connect the 8-690 relay box, an RS485-690 interface must be installed on COM6 and configured as "Relay box 8":
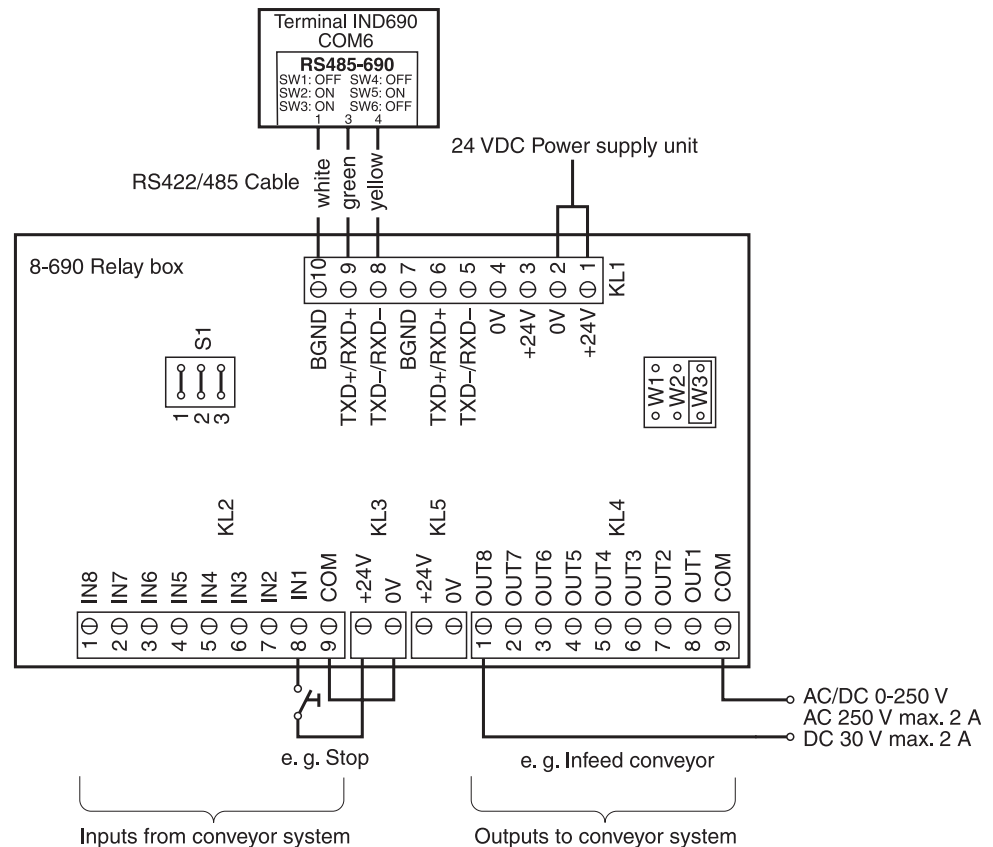
Note

The 8-690 relay box can also be replaced with 4I/O-690 interfaces and 4-690 relay boxes.

1. Relay box 4-690 on COM6	IN1 … IN4	Terminal 2, IN0 … IN3
	OUT1 … OUT4	Terminal 3, OUT0 … OUT3
2. Relay box 4-690 on COM5	IN5 … IN8	Terminal 2, IN4 … IN7
	OUT5 … OUT8	Terminal 3, OUT4 … OUT7

Terminal KL2	Assign-ment	Relay box 8-690: Inputs from conveyor system		
		FULLY AUTOMATIC MODE	SEMI-AUTOMATIC MODE	REMOTE MODE
8	IN 1	External STOP/START key	not in use	not in use
7	IN 2	External TARE key	External TARE key	External TARE key
6	IN 3	not in use	SUM, CLEAR key sequence	SUM, CLEAR key sequence
5	IN 4	not in use	SUM, ENTER key sequence	SUM, ENTER key sequence
4	IN 5	not in use	PLUS key	PLUS key
3	IN 6	not in use	ENTER key	ENTER key
2	IN 7	not in use	not in use	not in use
1	IN 8	not in use	not in use	not in use

Termi-nal KL4	As-sign-ment	Relay box 8-690: Outputs to conveyor system				
		CHECKING	CLASSIFYING	WEIGHING, WEIGHING 1+1	TARGET TOTALIZING	REMOTE OPERATION
8	OUT 1	Fully automatic mode: Conveyor belt Semi-automatic mode: not in use	Fully automatic mode: Conveyor belt Semi-automatic mode: not in use	Fully automatic mode: Conveyor belt Semi-automatic mode: not in use	Fully automatic mode: Conveyor belt Semi-automatic mode: not in use	not in use
7	OUT 2	Weight TOO HIGH Weighing platform 1	Class 2	Outlet flap Weighing platform 1	Warning threshold reached	not in use
6	OUT 3	Weight TOO LOW Weighing platform 1	Class 3	Inlet flap Weighing platform 1	End value reached	not in use
5	OUT 4	Weight TOO HIGH Weighing platform 2	Class 4	Outlet flap Weighing platform 2	not in use	not in use
4	OUT 5	Weight TOO LOW Weighing platform 2	Class 5	Inlet flap Weighing platform 2	not in use	not in use
3	OUT 6	Weight TOO HIGH Weighing platform 3	Class 6	Outlet flap Weighing platform 3	not in use	not in use
2	OUT 7	Weight TOO LOW Weighing platform 3	Class 7	Inlet flap Weighing platform 3	not in use	not in use
1	OUT 8	Fully automatic mode: Infeed belt Semi-automatic mode: not in use	Class 8	Fully automatic mode: Infeed belt Semi-automatic mode: not in use	Fully automatic mode: Infeed belt Semi-automatic mode: not in use	not in use

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