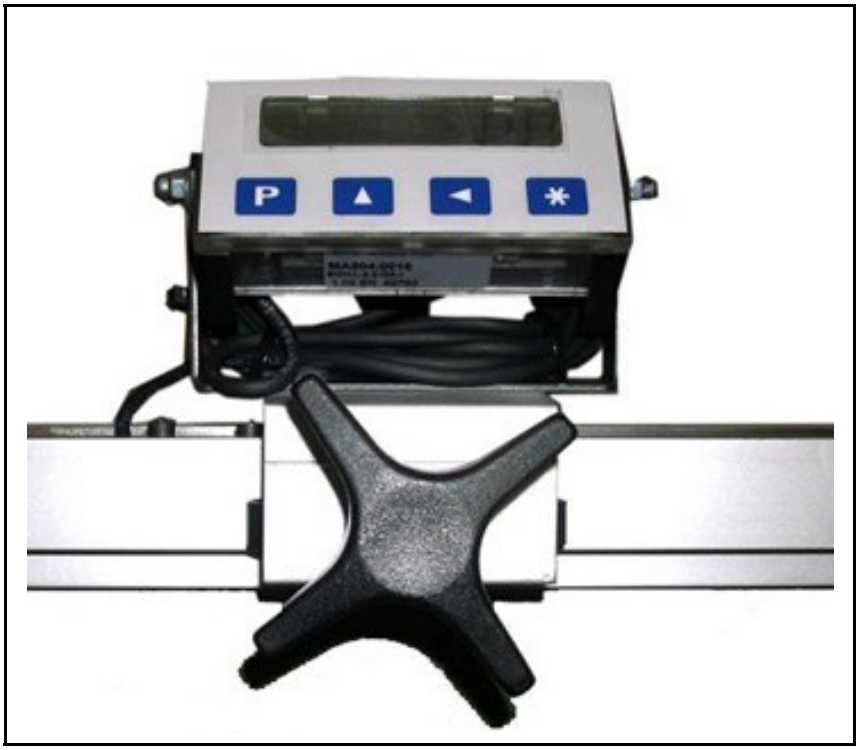
# Instruction Manual

## MORSØ Digital Measuring System

## Manual

## Morsø-F

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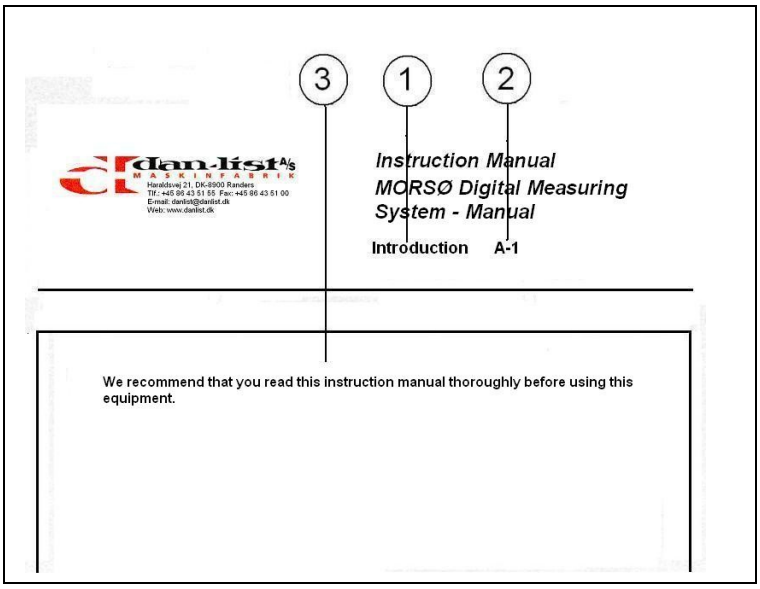
## *Introduction*




We recommend that you read this instruction manual thoroughly before using this equipment.

Damage or faults on the equipment caused by misuse or incorrect operation are not covered under our conditions of warranty.

***Use of the Instruction Manual:***

The reference system of this Instruction Manual described below will help you to quickly find the information you require (Picture A-1-1)

**(1) Subject Heading**

**(2) Page Index**
The letter (A) refers to the description of the section.
The number (1) refers to the page number of that section.

**(3) Text**
Description of the subject heading.

**Illustration**
A three dimensional, numbered drawing of the text subject. The numbers in the text correspond to the numbers in the drawing.

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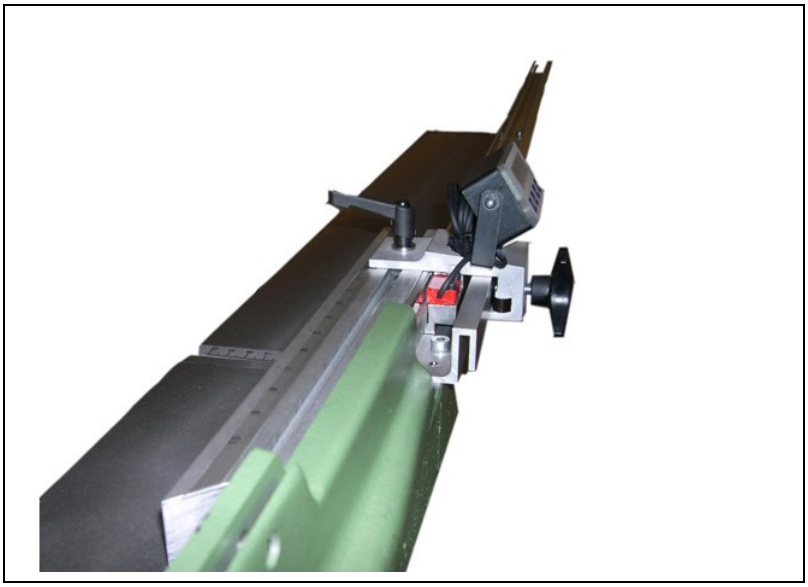
## *Fitting*



The beam is fitted onto the extension table by means of the screws in the same way as the standard beam is fitted.

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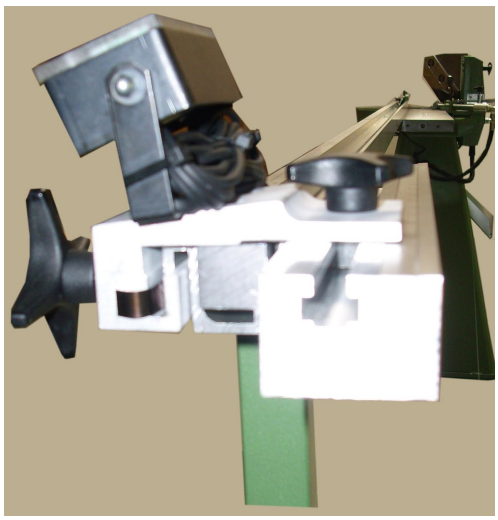
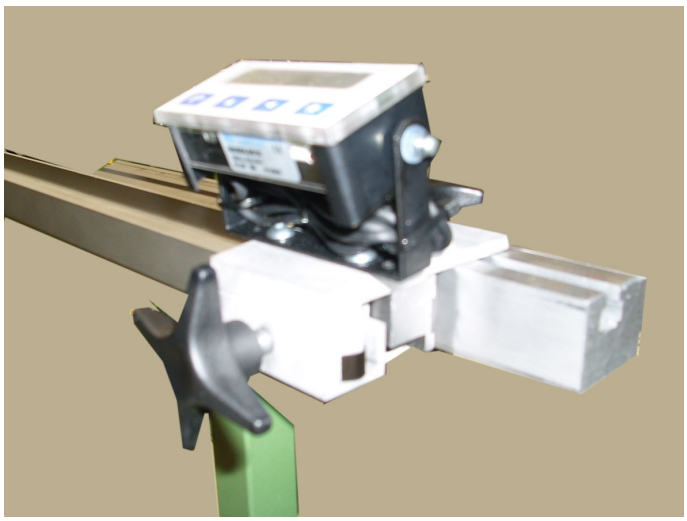
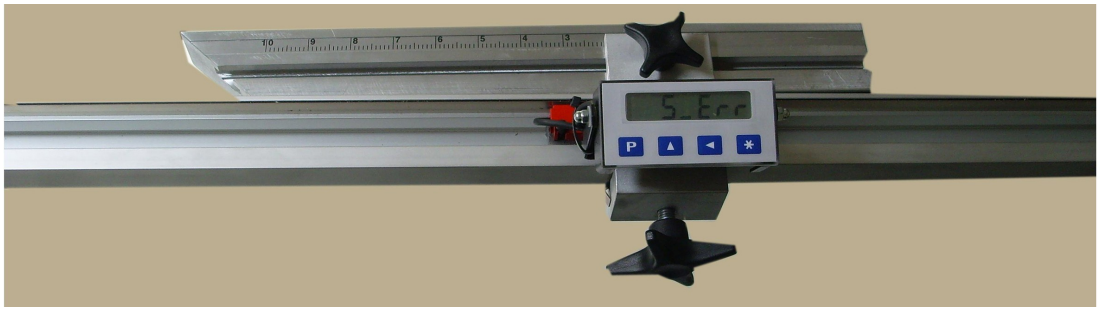
## *Fitting*





The digital display is pushed into the beam from the end – as shown on the pictures.




The stop beam is fitted into the stop block with the digital display.

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## *General Description*

**SOFTWARE S (Standard)**

### 1. Keys' function

Depending on the operating mode the keys may have additional functions (see "Programming mode' and 'Input mode'). The keys are pressed singly or in pairs (tow together).

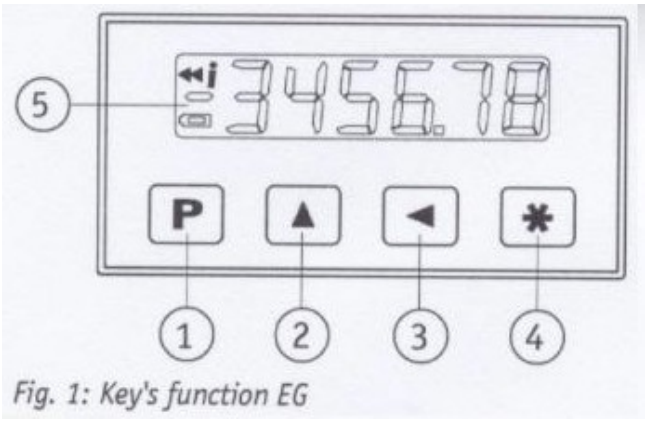
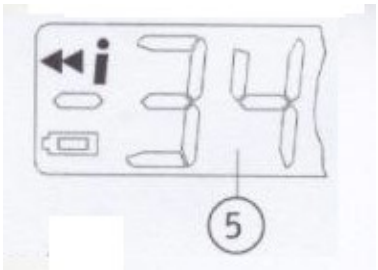



*Fig. 1: Key's function EG*




1. Programming
2. Select 'value'
3. Select 'digit'
4. Store value
5. Display: battery change /
   incremental measurement function / sign

## 2. Programming mode

The display is either pre-programmed to standard values at our works or, if the order defines customer-specific parameters, these will be pre-programmed at SIKO. Enter programming mode for parameter modification / programming. Normally programming is only necessary at initial installation. Parameters can be modified and checked at any time. They are stored in a non-volatile memory. Each parameter's designation, function and value range is shown in tables on the following pages.

**To enter** into programming mode:

Press key [ **P** ] for at least 4 s.

**To leave** programming mode:
Automatically, if no key has been pressed during approx. 30 s, or press key [ **P** ] until the end of the parameter list is reached.

**To scroll** parameter information:
Use key [ **P** ]

**To change** parameters:
Use keys [▲] and [◀]

**To store** modified parameters:
Press key [ ] then message "-sto-" will be briefly displayed.

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## 3. Parameter description

At the end of this user information brochure you will find a detailed **parameter list** showing all programmable parameters and offering space for customer-specific programming values.

( in English, parameter Lan = "E")

| **Display** "choice" | **Designation / description** |
|---|---|
| **rES** | Resolution: Determines the resolution of the display. Parameter "FrEE", allows the programming of a calculating factor. |
| **FAc** | Calculation factor (only available, if 'Resolution' has been programmed to "FrEE" before): Used to obtain for example an angle display. Basis is the maximal possible resolution of 1/100 mm. The calculation factor "FAc" which has to be programmed results from:<br>FAc = meas. range / total travel distance [1/100 mm]<br>*Example:* Angle measurement on a circular disk with a display range of 0 … 180º; display in 1/10º; circumference of the circular disk 942,48 mm; hence total travel distance 471,24 mm; FAc = 1800 / 47124 = 0,3820 |
| **dP** | Decimal point (only available if 'Resolution' has been programmed to 'FrEE' before): Determination of the decimal point according to the resolution. |
| **rEF** | Reference value: Absolute reference point of the measuring system. This value is set by referencing the system according to chapter 4. |
| **oFS** | Offset: Can be any value; used to influence the value displayed, e.g. tool correction value. |
| **dir** | Counting direction of the measuring system: depends on the sensor's mounting position and can be changed subsequently. |
| "uP"<br>"dn" | Upward<br>Downward |

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| **Display** "choice" | **Designation / description** |
|---|---|
| **Auto** | Switch-off method (Sleep-Mode):<br>State of the automatic switch-off. |
| "oFF" | no switch-off. |
| "on" | automatically switch-off<br>***Note:*** *The display returns to the normal operation mode (display mode) by pressing a key or traversing the sensor.* |
| **PEriod** | Switch-off time: Interval between last measurement and automatic switching off. |
| **4_Abs** | Delayed reset function:<br>Key [ ✱ ] must be pressed for approx. 4 s to reset the display to reference value. |
| "oFF" | Function off |
| "on" | Function on |
| **F_AbS** | Access reset function: resetting to reference value via key [✱] on front of the display. |
| "oFF" | Reset function off |
| "on" | Reset function on |
| **F_rEL** | Access incremental measurement: to switch from absolute dimension and zero-setting to subsequent relative dimension |
| "oFF" | Increm. meas. function off |
| "on" | Increm. meas. function on |
| **F_rEE** | Access reference value: to enter / change reference value |
| "oFF" | Reference value function off |
| "on" | Reference value function on |
| **F_oFS** | Access offset value: to enter / change offset value |
| "oFF" | Offset value function off |
| "on" | Offset value function on |
| **Lan** | Language: to choose the language in which the menu point are to be displayed. |
| "d" | German |
| "E" | English |

## 4. Input Mode

### Reset function via keyboard

- Press key [ ✱ ] to set the display to the reference value.

- If parameter 'delayed reset function' (4_Abs) is programmed to "on", the display will be set to the reference value after approx. 4 s.

***Preconditions:*** *Parameter 'Reset enable' (F_AbS) in programming mode must be programmed to "on", but unit must* ***not*** *be left in programming mode (see chapter 2* ***'To leave*** *programming mode').*

### Incremental measurement

Press the two arrow keys [▲] + [◄] simultaneously to activate incremental measurement function.

- The display is zeroed.

- The Display shows the symbol ◄◄

- Leave incremental measurement function by another simultaneous press of the two arrow keys [▲] + [◄]. The absolute measuring value is displayed again.

- While in the incremental measurement mode the display can also be set to zero by pressing key [✱]. This does not change the absolute measurement in the background.

***Precondition:*** *Menu point 'Incremental measurement enable' (F_rEL) in programming mode must be programmed to "on", but unit must* ***not*** *be left in programming mode (see chapter 2* ***'To leave*** *programming mode').*

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**4. Input Mode**

**Reference and/or offset value modification**

Press the two keys [**P**] + [▲] simultaneously to enter a new reference value.

Press the two keys [**P**] + [◄] simultaneously to enter a new offset value.

The display then shows the reference/offset value, which can be changed via the two arrow keys.

Press key [ ✱] to store the new value.

In no key has been pressed for approx. 30 s or if you press again key [**P**], MA504 will return to display mode.

***Precondition:*** *In programming mode menu points 'Reference value input enable' (F_rEF) 'Offset input enable' (F_oFS) respectively must be programmed to "on", but unit must* ***not*** *be left in programming mode (see chapter 2* ***'To leave*** *programming mode').*

## 5. Trouble shooting

Error states are recognized and shown in the display:

**Message:** full
**Description:** display overrun
**Action:** check parameters and adjust them if necessary; set display to reference value.

**Message:** display blinking.
**Description:** missing referencing.
**Action:** set display to reference value

**Message:** S_Err
**Description:** faulty / no sensor signal
**Action:** check gap between sensor and magnetic strip.

**Symbol:** Battery symbol is active
**Description:** battery voltage below the admissible values.
**Action:** Change the batteries.

**Message / Effect:** ◄◄ comes on / MA504 cannot be referenced
**Description:** Display is still in incremental measurement function
**Action:** Leave incremental measurement function as described in chapter 4 or proceed as follows:

1. Enter into programming mode
2. Program parameter 'F_rEL' to "on"
3. Leave programming mode
4. Leave incremental measurement function as described in chapter 4
5. Enter programming mode again
6. Program parameter 'F_rEL' to "off"
7. Leave programming mode

**Beware of the extremely sharp knives**

## 6. Application Examples

### Length measurement

**Required:** Display accuracy 1/10 mm. Display shall be zeroed via function key

| Designation | Display | Progr. value |
|---|---|---|
| Resolution | **rES** | 0.1 |
| Decimal point | **dP** | 0.0 |
| Reference value | **rEF** | 00000.0 |
| Offset | **oFS** | 00000.0 |
| Counting direction | **dir** | uP |
| Switch-off method | **Auto** | oFF |
| Delayed reset function | **4_Abs** | oFF |
| Access: reset | **F_AbS** | on |
| Access: increm. meas. | **F_rEL** | oFF |
| Access: ref. value | **F_rEF** | oFF |
| Access: offset | **F_oFS** | oFF |
| Language | **Lan** | E |

### Angle measurement

**Required:** display range 0 … 360º; display accuracy 1/10º. Display shall be zeroed via function key. Automatically switch-off after 0.5 h.

**Conditions:** circular disk with ø300 mm; resulting total circumference: U = π X 300 mm = 942,48 mm

The programmable factor is calculated as follows:
**FAC = total display range [1/10°] / circumference [1/100 mm]**

3600 / 94248 = 0,03820

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## 6. Application Examples

| Designation | Display | Progr. value |
|---|---|---|
| Resolution | **rES** | FrEE |
| Calculating factor | **FAc** | 0.03820 |
| Decimal point | **dP** | 0.0 |
| Reference value | **rEF** | 00000.0 |
| Offset | **oFS** | 00000.0 |
| Counting direction | **dir** | uP |
| Switch-off method | **Auto** | on |
| Switch-off time | **PEriod** | 0.5 |
| Delayed reset function | **4_Abs** | oFF |
| Access: reset | **F_AbS** | on |
| Access: increm. meas. | **F_rEL** | oFF |
| Access: ref. value | **F_rEF** | oFF |
| Access: offset | **F_oFS** | oFF |
| Language | **Lan** | E |

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## Appendix: Parameter list

| Display | Designation / Value Range | Standard programm. | Your programming |
|---|---|---|---|
| **rES** | resolution (mm, In=inch) 1**, 0.1, 0.05, 0.01, In 0.01, In 0.001, FrEE** | 0.1 | |
| **FAc** | calculation factor (only if resolution has been programmed to "FrEE") **0.00001 … 9.99999** | 1.00000 | |
| **dP** | decimal point (only resolution has been programmed "FrEE") **0. to 0.000** | 0.00 | |
| **rEF** | reference value: **-99999 … (+)99999** | 00000.0 | |
| **oFS** | offset value: **-99999 … (+) 99999** | 00000.0 | |
| **dir** | counting direction: **uP, dn** | uP | |
| **Auto** | switch-off method: **on, oFF** | oFF | |
| **PEriod** | switch-off time (in hours) (only for switch-off methods 'on') **0.2, 0.5;1.0** | 0.2 | |
| **4_Abs** | Delayed reset function: **on, oFF** | oFF | |
| **F_AbS** | access reset function: **on, oFF** | on | |
| **F_rEL** | access increm. measurement: **on, oFF** | oFF | |
| **F_rEF** | access reference value: **on, oFF** | oFF | |
| **F_oFS** | access offset value: **on, oFF** | oFF | |
| **LAn** | language **d, E** | d | |