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## USE AND MAINTENANCE MANUAL

### MICROPROCESSOR-BASED DISPLAY UNIT WITH SSI F1X5\_SSI INPUT

**Purpose of the manual**

This manual has been created by the manufacturer to provide all the necessary information to those who, relative to the instrument, are authorised to carry out safely installation, maintenance, dismantling and disposal tasks. All necessary information for buyers and designers is reported in the "sales catalogue". In addition to complying with the correct technical construction rules, the information must be read attentively and rigorously applied.

Non compliance with the stated rules can cause health risks, risks to personal safety and cause economic damage. This information manual, originally created by the manufacturer in the Italian language, is also available in other languages to satisfy legislative and/or commercial requirements. The documentation must remain in the possession of the person responsible for the proposed task, in a suitable place to conserve it in the best condition, where it is easily accessible for consultation. In the case that it is lost or deteriorates, request a substitute directly to the manufacturer, quoting the code of the present manual. The manual reflects the technological status at the time the product is introduced on the market. The manufacturer however, reserves the right to make modifications, additions or improvements to the same manual without the need to consider the current version as unsuitable.

**Identification of equipment**

The identification plate is applied to the instrument. To determine the meaning of the instrument identification code, refer to the sales catalogue.

**Environmental Conditions**

Ambient temperature range: min. 0°C, max. + 50°C. It is forbidden to use the instrument, if not explicitly permitted for the purpose, in potentially explosive atmospheres or where the use of anti-explosive components is required.

**Storage**

Below are some recommendations to which attention should be paid in the storage of the instrument. Avoid excessively humid environments and exposure to the elements (do not store outside). Avoid the instrument direct contact with the floor. Place the instrument in its original packaging.

**Declaration of conformity and CE marking**

The instrument complies with the following Community Directives:  
2014/30/EU Electromagnetic compatibility, 2014/35/EU Low voltage, 2011/65/EU RoHS.

**Maintenance**

The equipment does not require particular maintenance interventions except cleaning, which must only be carried out exclusively with a soft, damp cloth with ethylic alcohol or water. Do not use solvents derived from hydrocarbons (trichloroethylene, gasoline, diluents etc.). The use of these products will irreversibly compromise the functioning of the instrument. Repairs must be carried out exclusively at a FIAMA technical assistance centre.

**Calibrations and checks**

It is advisable to check calibration of the instrument periodically, about every working year. To carry out calibrations, refer to the calibration procedure described in this manual.

**When assistance is required**

For any technical assistance required, refer directly to the sales network of the manufacturer, stating the figures indicated on the identification plate, the approximate number of hours of use and the type of fault detected.

**Responsibilities of the manufacturer**

The manufacturer is not responsible in case of:

- use of the instrument which does not comply with national safety and accident-prevention laws;
- incorrect installation, lack or incorrect observation of the instructions stated in this manual;
- Electricity supply faults;
- Modifications or tampering;
- Operations being conducted by unauthorised or unqualified personnel.

The safety of the instrument also depends on the scrupulous compliance to the regulations stated in this manual, and in particular it is necessary: always operate within the operating limits of the instrument and always carry out a careful ordinary maintenance.

- Assign to the inspection and maintenance phases operators trained to carry out this task.
- The preset configurations in this manual are the only ones permitted.
- Do not try to use the instrument in any way other than that stated in the instructions provided.

• The stated instructions in this manual do not substitute, but complement the obligations of the legislation in force regarding safety regulations.

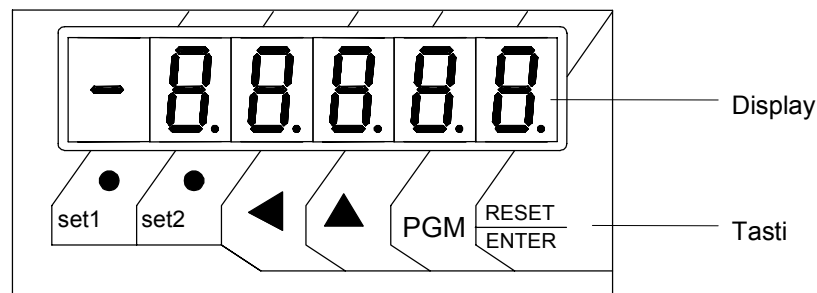
### Description

The F1X5\_SS instrument is six-digit display unit (reading scale –99999 , +999999) with an input from transducers that use the SSI interface (encoder, optical lines, position transducers, pressure transducers, etc.). Through four keys placed on the front panel, it is possible to set up all parameters of the instrument, in particular the SSI protocol (gray or binary), the bit number (selection from 4 to 24), the scale factor, the method for the reset/preset of the dimension, etc. The display unit can be provided in versions with two relay outputs with programmable thresholds and an output RS232/RS485 for communication with remote units (PLC) in modbus protocol.

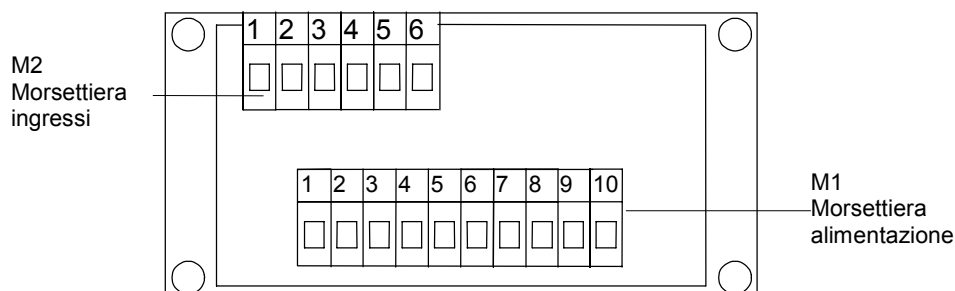
The instrument stores the data when the machine is off through non-volatile EEPROM memory.

The display unit is housed in a 48x96 panel case under the DIN 43700 regulations.

### Front view



### Rear view



### Installation

Before installing, connecting or using the instrument read the following instructions:

- Connect the instrument scrupulously following the manual instructions.
- Always make the connections using types of cable appropriate for the power and current limits indicated in the technical data.
- The instrument is NOT equipped with an On/Off switch, therefore it turns on immediately when connected to the power supply; for safety reasons the equipment permanently connected to the electricity supply requires: a two-phase selector switch marked with the appropriate symbol; this will be positioned in the vicinity of the instrument to be easily accessible to the operator; a single switch can control numerous instruments.
- If the instrument is connected to NON-insulated electrical equipment (e.g. thermocouples), the earth connection must be carried out with a specific lead to prevent this taking place directly through the very structure of the machine.
- If the instrument is used in applications with risks of damage to people, machines or materials, it is absolutely necessary that it is combined with auxiliary alarm systems. It is advisable to ensure the possibility of verifying the intervention of the alarms also during regular functioning.
- It is the responsibility of the user to verify, before use, the correct selection of the instruments parameters, to avoid damages to people or property.
- The instrument will NOT work in environments with a dangerous atmosphere (flammable or explosive); it can be connected to elements which operate in such atmosphere only through appropriate and suitable types of interface, conforming to the local regulations in force.

h) The instrument contains components sensitive to electrostatic charge, therefore the handling of the electronic cards in it must be carried out with the appropriate devices, with the aim of avoiding permanent damage to the very components.

### Power supply

- Before connecting the instrument verify that the power voltage is within the permitted limits indicated on the plate.
- Carry out electrical connections with the instrument disconnected.
- For the instruments and sensors supply, beforehand create a supply line separated from the power line: if necessary use an isolating transformer.
- The supply line must provide a sectioning device with fuses upstream the instruments and must not be used to control relays, contactors etc.
- If the network voltage is seriously disturbed (switching of power groups, motors, inverters, welders etc.) use the appropriate filters.
- If an earth connection is required, make sure that the equipment is provided with a good earth installation: voltage between neutral and earth  $< 1V$  and resistance  $< 6 \text{ Ohm}$ .

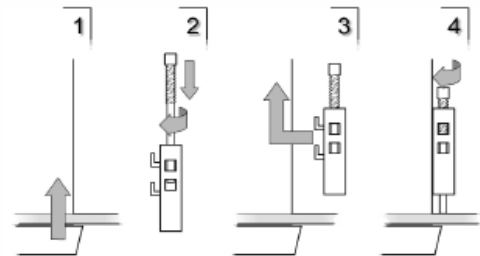
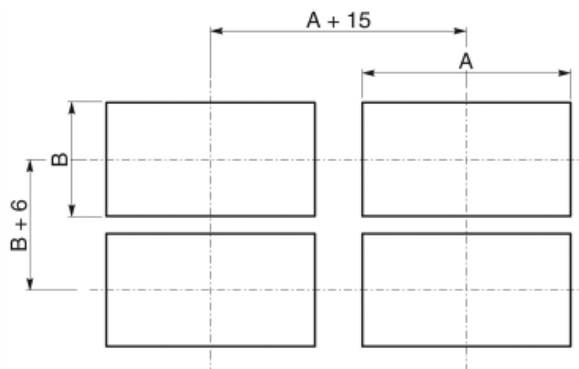
### Connection of inputs and outputs

- Physically separate the input cables from the supply cables, the output cables and from the power connections; use shielded twisted pair cables, with display unit connected to ground in one point only.
- Connect the setting and alarm outputs (contactors, solenoid valves, motors, electric fans, etc.) by assembling RC groups (resistance and capacitor in series) parallel to inductive loads working in AC mode.

### Assembly of the instrument

For a correct installation of the instrument, follow the procedure outlined below:

- Insert the instrument in the specific cut-out.
- Screw the screw onto the fixing block.
- Hook the block to the instrument by means of the gains
- Block the instrument by screwing the screws of the two blocks.
- After that, make the electrical connections.



To assemble several instruments side-by-side, make sure axle bases are correct, as shown in the drawing. Dimensions A and B can be read in the overall dimensions indicated in the manual.

**PROGRAMMING**

The keys used for programming are the following:

<b>PGM</b>	To start programming
▲	To increase the digit undergoing modification, To select the constant to be modified
◀	To move from one digit to the next one, To exit the constant setting mode

**RESET/ENTER** To confirm the entered values

Push **PGM** To enter the programming phase, the wording "000" will be displayed with the first digit to the right blinking: this is the password request; enter the number **273** as outlined below:

push ▲ To increase the value of the blinking digit,  
push ▶ To select the blinking digit,

After setting the value 273, confirm by means of **RESET/ENTER** and the wording **AddrES** will be displayed for some seconds, followed by a 3-digit number.

N.B.: in case a wrong password is entered, the instrument exits the programming phase.

push **RESET/ENTER** And modify the value of the constant by means of keys ▲ ▶, or  
push ▲ To move to other constants, or  
push ▶ twice in a row to exit the programming mode.

The constants to be set, which once in the programming phase can be scrolled by means of the key ▲, are the following:

<b>AddrES</b>	address device for serial communication (not used in this version),
<b>bAud</b>	Baude Rate for serial communication (not used in this version),
<b>InPut</b>	Gray/Binary data format
<b>NR22</b>	reset mode,
<b>PrESEt</b>	Preset dimension,
<b>SSI IF ILt</b>	SSI input filter,
<b>SSIb it</b>	number of bits of the SSI interface ,
<b>SiGn</b>	data format with or without sign,
<b>OFFSEt</b>	Dimension offset ,
<b>ndEC</b>	Position of the decimal point,
<b>Multi</b>	Dimension multiplication factor,
<b>div</b>	Dimension division factor

**Meaning of constants**

**AddrES** Address device for serial communication  
Not used in this version.

**bAud** Baud rate for serial communication  
Not used in this version.

**InPut** Gray/Binary data format

It defines the format of data of the SSI interface: if 0, the format is binary; if 1 the format is Gray. This parameter shall be set in line with what is requested by the transducer connected to the display unit.

### **RAZZ**      **Reset mode**

Setting of the reset mode allows for the selection of the instrument behaviour when the RESET/ENTER key is pushed or after activation of the RESET input.

On the basis of the following table, select the chosen reset mode:

<b>RAZZ</b>	<b>Action of the RESET/ENTER key or RESET INPUT</b>
0	Key disabled
1	Reset
2	Preset
3	Incremental/absolute reading function (*)
4	Delayed Reset (push for 1 sec approx.)
5	Delayed Preset (push for 1 sec approx.)

(\*) the absolute/incremental reading function enables you to reset the dimension in one point, make a change and then restore display of the absolute dimension.

Example: if the current position is 100 (absolute dimension), by pushing RESET/ENTER or by activating the RESET input, you move to the relative dimension, the dimension on the display is zero set and the first digit to the right blinks to indicate the relative reading mode. By a change of 50, 50 will appear on the display; by pushing RESET/ENTER or by activating the RESET input, the display will show the absolute dimension that will be 150 (= 100 + 50).

By turning off the instrument with relative dimension displayed, when switching on the instrument, the absolute dimension is displayed and the relative dimension is lost.

### **PRESET**      **Preset dimension**

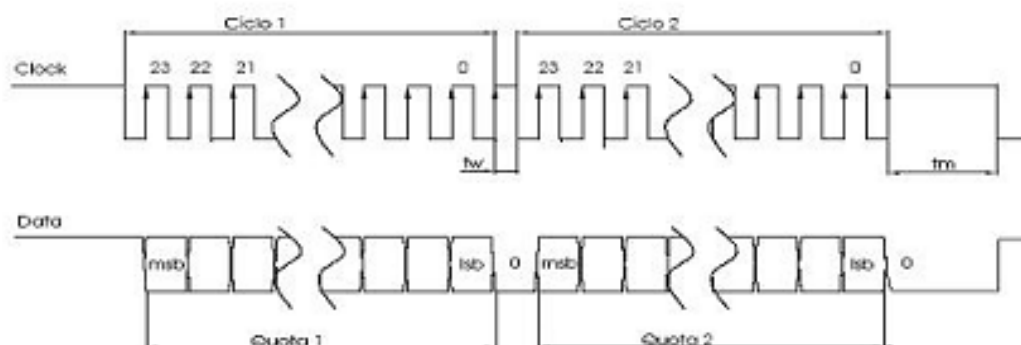
The instrument allows for the setting of the value that will be displayed after pushing the RESET/ENTER key, in line with what is indicated in the table above M.Azz. "Reset mode".

Allowed values range between -999999 and 999999.

### **SSIFILT**      **SSI input filter**

By setting 1, the noise-proof filter is activated (if this function is supported by the transducer). For example, with the transducer for absolute magnetic band MAT, the measure of the dimension is made with a double reading Burst, leaving a smaller interval of  $t_m$  (16µs) between the first and the second Burst, so that the dimension is not updated between the two readings. Consequently, if the two dimensions were different, this would mean the reading has been altered by the noise and shall hence be repeated.

By setting 0 (default value) this function is disabled.



**SSI bits**      **Number of bits of the SSI interface**

Number of bits of the SSI protocol to be set in line with the value requested by the transducer connected to the F1X5\_SSI display unit. Such value can range between 4 and 24.

Default value: 24. Value for the MAT transducer: 24.

**SSign**      **SSI data item with or without sign**

It defines the display mode of the data provided by the SSI transducer. Example: with **SSign**= 0, in a 4-bit communication in binary format, dimension 1111 is displayed as 15, otherwise, if **SSign**= 1, -1 is displayed, being negative numbers represented in two's complement.

N.B: if the bit number is 24, all the negative dimensions are displayed with negative sign regardless of the value of **SSign**. Value for the MAT transducer: 0

**Offset**      **Displayed dimension offset**

By means of this constant it is possible to add or subtract a value from the dimension shown on the display.

By setting a positive value, this value is subtracted from the displayed dimension. By setting a negative value, this value is added to the displayed dimension.

**ndEC**      **Position of the decimal point**

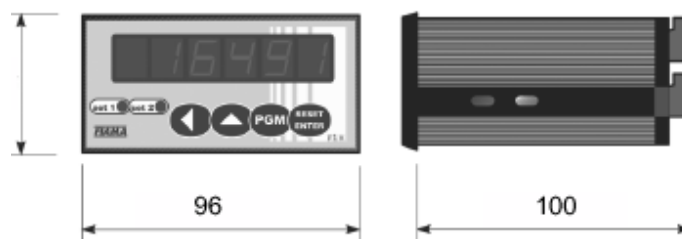
This constant indicates the position of the decimal point; set 0 for no decimal, 1 for 1 decimal, etc... Allowed values: 0 to 4.

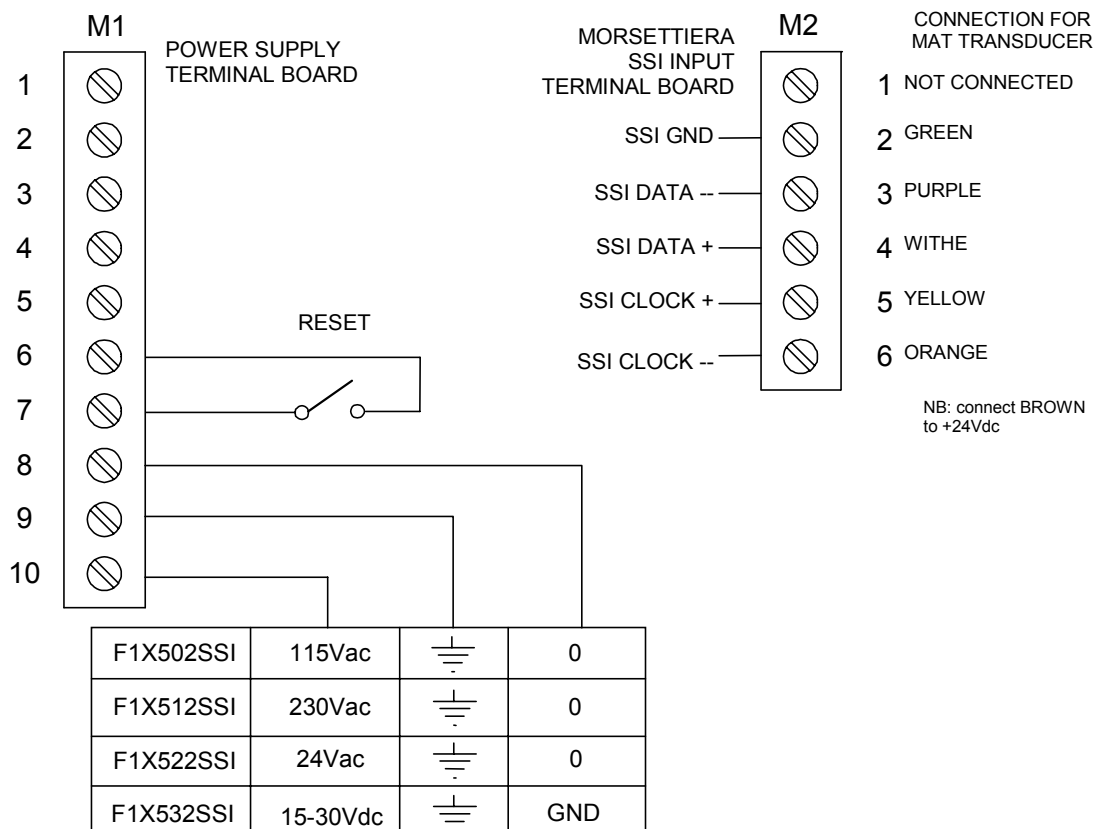
**mult**      **Dimension multiplication factor**

The display unit can modify the value read by the transducer by multiplying it by **mult** and dividing it by **div**. By setting these two constants properly, the chosen value can be shown on the display. The range of allowed values is  $1 \div 999999$ . Default value 1.

**div**      **Dimension division factor**

See above.

**Overall dimensions**

**Connections diagram****Technical features**

Power supply	115Vac, 230Vac, 24Vac, 24Vdc $\pm$ 10%
Line frequency	50/60 Hz
Absorbed power	3VA
Display	6 digits -99999,+999999
Communication protocol	SSI (standard RS422)
Number of bits	From 4 to 24 (settable)
Data format	Gray / binary
Serial port (option)	RS232, RS485
Two relay outputs (option)	120Vac, 0,5A; 24Vdc, 1A
Working temperature	0-50°C
Relative humidity	10-90%
Self-extinguishable shock-proof case	DIN 43700
(Front) protection of the case	IP54
Dimensions (HxLxP) (with terminal board)	48x96x100 mm
Panel Cut-out	45x92 mm
Electromagnetic compatibility	2014/30/EU
Low voltage	2014/35/EU
RoHS	2011/65/EU

**Manufacturer**

Every communication to the manufacturer shall be addressed to:

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**FIAMA srl will not be held responsible for damage to people or property resulting from tampering with and misuse or use non-complying with the characteristics of the instrument.**