A - 01

Universal "Key" for a fast and reliable Tecnologic's instruments configuration.

INSTRUCTIONS MANUAL
Vr. 3.1 (GB) - cod.: A01-ENG

1. INTRODUCTION

The new key is able to operate with 4 different "objects":
- One instrument
- A second key
- A Personal computer
- A Personal computer and one instrument

The key is subject to different "rules" according to the different connected object and to the different action to be made.
Note: The key is able to memorize all configuration parameters of one instrument at a time.

1.1 Dialogue between a Key and an instrument.

It is possible to perform two different actions:
- To copy parameter values from instrument memory to the key memory.
- To copy parameter values from key memory to the instrument memory.

No specific rules are enabled when a copy from instrument memory to the key memory is required (it is ever possible to memorize in the key the configuration set of an instrument).
Moreover, this action will copy all parameters (program parameters also when present).

On the contrary, before to transfer data from a key to an instrument, the key will verify if all rules able to guarantee the configuration integrity are satisfied. These rules guarantee that the configuration sent to an instrument :
1) has been created for the same instrument type
2) It will use resources built in the connected instrument.

1.2 Dialogue between two keys

The dialogue between two keys of the same type is not subject to specific rules (it is ever possible) and it will perform the integral copy of all parameter set (program parameters or logging parameters too).
Note that the dialogue between two different keys (a new key transfer to an old one) is not allowed.

1.3 Dialogue between a key and a PC

This action also is not subject to specific rules (it is ever possible) and it will perform the integral copy of all parameter set (program parameters or logging parameters too).
Warning: the key do not verify the congruence of the data coming from a PC. The software in the PC must be able to perform all tests necessary to ensure the integrity and congruence of the configuration transferred to the key.
NOTE: when the configuration in the PC has been copied from another instrument, we can be sure that it will be congruent.

For this kind of dialogue, the key can be set in order to perform or not a special service related to the structure (protocol) used by Tecnologic's instruments to transfer data through TTL interface. As a matter of fact, Tecnologic's instruments (exception made for TLZ) use ModBus protocol for all interfaces but on the TTL interface they put 3 (FF) character before the standard string. These characters are used by the instrument micro for the "silence" period calculation necessary to identify the beginning of a new string.
By setting properly the dip switches, it is possible to obtain a dialogue with or without the 3 additional characters (FF).

1.4 Dialogue between an instrument and a PC by the key

In this action the key is used as a smart converter.
The key is able to perform two different conversions:
– TTL <-> USB (It allows the dialogue between ALL Tecnologic's instrument and a PC)
– RS 485 <-> USB (It allows the dialogue between a PC and an instrument [Tecnologic's or not] equipped with an RS485).

In this case also the key can be set in order to filter or not the 3 (FF) characters.
The "Smart" definition it is not only due to the capability to manage the (FF) characters but also to the automatic management of the RS 485 line direction.

NOTE: In this mode, the key does NOT verify the consistency of the data coming from the PC. When you transfer a configuration from a PC to an instrument, the consistency must be guaranteed by the software in the PC.

2. How to operate

2.1 How to load the key driver on a Windows based computer.
a) Power up the key by the external power supply.
b) Set the dip switches as shown below

c) Connect the key to the PC by the USB cable. The operative system will detect a "Found New hardware".
d) When the system shows the message "Consentire la connessione a Windows Update per la ricerca del software" Select "non ora" and push "Next"
e) Select "Display a list of the known drivers..."
f) Select "Includi il seguente percorso nella ricerca"
g) Make access to the CD received with the key and select the sub-directory: XpDriver/ or VistaDriver/ according to the used operative system.
h) Push "Next"
i) Push "Finish"
l) Disconnect the key and connect it again.

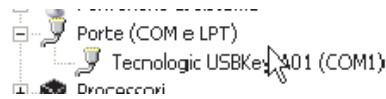### 2.2   How to set the comm parameters.
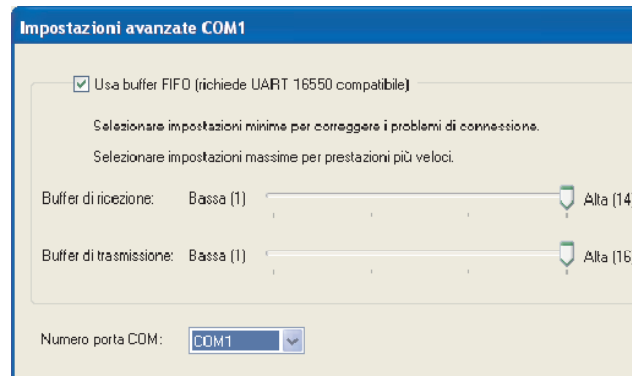a) Enter in "Control panel"
b) Run "System"

c) Select "Hardware"
d) Push "Device manager"
e) Double click on "Ports"
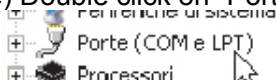
f) Double click on Tecnologic USB_Key_A01

g) Select "Port setting"
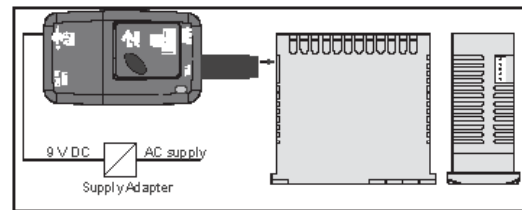h) Push "Advanced"
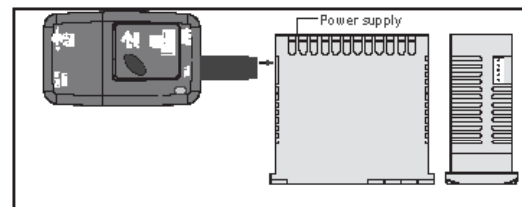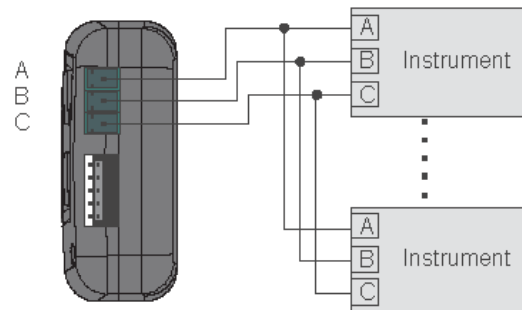i) Force the desired comm number.

2.3 Connections
Note: This device is designed for a temporary connection to the instruments.

Connection to an instrument using an external power supply (instrument not powered)

Connection to an instrument without external

power supply (the instrument must be powered) RS 485 connectionCollegamento interfaccia RS 485

2.4 Instrument behaviour at power up.

Power up the instrument.
After a time out of 1,5 s the LED will assume one of the following status:

LED OFF= Device not programmed. Send back the instrument to your supplier.

Green LED – Flashing fast = The device is properly programmed but no data are present in memory.

Red LED – Flashing fast = The device is properly programmed but a checksum error has been detected.
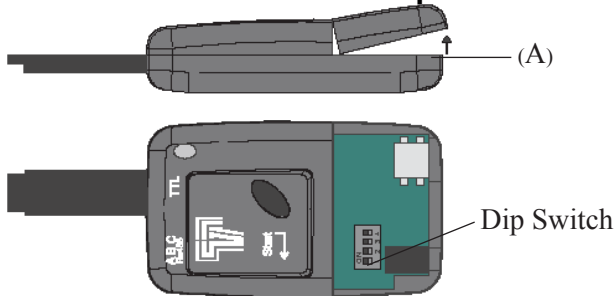The error will be correct automatically. Power off the instrument and power on it again.
If the error persist, send back the device to your supplier.

Green LED - steady = The device is properly programmed and a correct configuration is memorized.

Red LED -steady = the device is set in order to operate with a PC.

2.5 How to access to the dip switches

(A)

Dip Switch

Raise the cover (A).
It will be easy to identify the dip switches.

2.6 Operative mode selection

Mode 1 – Firmware version detection.
When it is desired to detect the firmware version of your key, proceed as follows:
a) Set the dip switches as shown below

b) Power up your device by USB or by an external power supplier.
c) Push the <Start> button.
d) The LED will go ON with green colour more times. The number of times will show the firmware release.
e) After this action the LED will go ON with red colour in order to show you that the action is finished.
f) After a time out of 1 second, the LED will go back to a green and steady colour.

Mode 2 – How to copy all parameters from an instrument to a key (Upload)
a) Set the dip switches as shown below

b) Be sure that the key and/or the instrument are powered (see 3.1 paragraph)
c) Connect the key to the instrument
d) Be sure that the LED shows a steady green or a flashing green.
e) Push the < Start > button on the key.
f) The LED will show a steady red colour in order to show that the copy is in progress.
g) Wait a few seconds.
At the end of the copy action the LED will show one of the following conditions:
  - **Green LED - steady**:
    The action is successfully finished.
    Now you can disconnect the key.
    The key have memorized a right and complete configuration.
  - **Red LED - flashing slow**: the action was not successful.
    The key has been removed before the and of the action or communication errors occurs.
    The key do NOT memorizes the desired data.
    The action must be repeated.

Mode 3 –   How to copy all data from a key to an instrument.
a) Set the dip switches as shown below

b) Be sure that the key and/or the instrument are powered (see 3.1 paragraph)
c) Connect the key to the instrument
d) Be sure that the LED shows a steady green.
e) Push the < Start > button on the key.
f) The LED will show a steady red colour in order to show that the copy is in progress.
g) Wait a few seconds.
At the end of the copy action the LED will show one of the following conditions:
  - **Green LED - steady**:
    The action is successfully finished.
    Now you can disconnect the key.
    The controller is correctly configured.
  - **Red LED - flashing slow**:
    The action was not successful.
    One of the following conditions occurs:
    I) The key has been removed before the end of the action
    II) A communication errors has been detected.
    III) The "PACS" parameter (this parameter allows to enable or disable the remote configuration of the instrument) is

programmed in order to disable remote instrument configuration.
In all cases the instrument is configured <u>as it was before this action</u>.
- **<u>Red LED - flashing fast</u>**:
    The action was not successful.
    One of the following conditions occurs:
    I) The configuration in the key is not compatible with the connected instrument.
    II) You have tried to send a configuration prepared (or copied) from a new instrument to an old instrument.
In all cases, the key and the instrument will maintain the configuration memorized before the tentative.

Mode 5 – How to copy the configuration only from a key to an instrument.
a) Set the dip switches as shown below

b) Be sure that the key and/or the instrument are powered (see 3.1 paragraph)
c) Connect the key to the instrument
d) Be sure that the LED is steady green.
e) Push the < Start > button on the key.
f) The LED will be steady red in order to show that the copy is in progress.
g) Wait a few seconds.
    At the end of the action the LED will show one of the following conditions:
    - **<u>Green LED - steady</u>**:
        The action is successfully finished.
        Now you can disconnect the key.
        The controller is correctly configured.
    - **<u>Red LED - flashing slow</u>**:
        The action was not successful.
        One of the following conditions occured:
        I) The key has been removed before the end of the action
        II) A communication errors has been detected.
        III) The "PACS" parameter (this parameter allows to enable or disable the remote configuration of the instrument) is programmed in order to disable remote instrument configuration.
In all cases the instrument is configured <u>as it was before this action</u>.
- **<u>Red LED - flashing fast</u>**:
    The action was not successful.
    One of the following conditions occured:
    I) The configuration in the key is not compatible with the connected instrument.
    II) You have tried to send a configuration prepared (or copied) from a new instrument to an old instrument.

In all cases, the key and the instrument will maintain the configuration memorized before the tentative.

Mode 7 – How to copy the program area only from a key to an instrument.
Note: This action is possible only on instruments equipped with programmer function.
a) Set the dip switches as shown below

b) Be sure that the key and/or the instrument are powered (see 3.1 paragraph)
c) Connect the key to the instrument
d) Be sure that the LED is steady green.
e) Push the < Start > button on the key.
f) The LED will be steady red in order to show that the copy is in progress.
g) Wait a few seconds.
    At the end of the action the LED will show one of the following conditions:
    - **<u>Green LED - steady</u>**:
        The action is successfully finished.
        Now you can disconnect the key.
        The controller is correctly configured.
    - **<u>Red LED - flashing slow</u>**:
        The action was not successful.
        One of the following conditions occured:
        I) The key has been removed before the end of the action
        II) A communication errors has been detected.
        III) The "PACS" parameter (this parameter allows to enable or disable the remote configuration of the instrument) is programmed in order to disable remote instrument configuration.
In all cases the instrument is configured <u>as it was before this action</u>.
- **<u>Red LED - flashing fast</u>**:
    The action was not successful.
    One of the following conditions occured:
    I) The configuration in the key is not compatible with the connected instrument.
    II) You have tried to send a configuration prepared (or copied) from a new instrument to an old instrument.
In all cases, the key and the instrument will maintain the configuration memorized before the tentative.

Mode 9 – How to copy all parameters from A (master) key to B (slave) key.
a) Set the dip switches as shown below

Master   Slave

b) Be sure that at least one key is powered.
c) Connect the two keys with the two pushbuttons on the same side.
d) Be sure that the LED of the master key is steady green while the LED of the slave key can show a steady green or a flashing green.
e) Push the < Start > button on a key.
f) The LED on the key where the button has been pressed will be steady red in order to show that the copy is in progress.
g) Wait a few seconds.
   At the end of the action the LED will show one of the following conditions:
   - **<u>Green LED - steady</u>**:
     The action is successfully finished.
     Now you can disconnect the keys.
     The slave key have memorized the configuration present in the master key.
   - **<u>Red LED - flashing slow</u>**:
     The action was not successful.
     One of the following conditions occured:
     I) One key has been removed before the end of the action
     II) A communication errors has been detected.
     III) No valid data are present in the slave key
   In all cases the master key is configured <u>as it was before this action</u>.
   Repeat the sequence.

Modo 10 – How to use the key as a smart converter USB <-> RS-485
a) Set the dip switches as shown below

b) Be sure that the key <u>and</u> the instruments are powered (see 3.1 paragraph)
c) Connect the key to the instrument by RS 485 terminals
d) Connect the key to the PC by the USB cable.
e) Be sure that the LED is steady red.
f) Verify the setting of the interface memorized by the PC.
g) During serial communication, the LED will flash every time that the master send a request.

Mode 11 – How to use the key as a smart converter USB <-> TTL without (FF) filter
a) Set the dip switches as shown below

b) Be sure that the key and/or the instrument are powered (see 3.1 paragraph)

c) Connect the key to the instrument by the 5 pin connector
d) Connect the key to the PC by the USB cable.
e) Be sure that the LED is steady red.
f) Verify the setting of the interface memorized by the PC.
g) During serial communication, the LED will flash every time that the master send a request.

Mode 12 – How to use the key as a smart converter USB <-> TTL with (FF) filter
a) Set the dip switches as shown below

b) Be sure that the key and/or the instrument are powered (see 3.1 paragraph)
c) Connect the key to the instrument by the 5 pin connector
d) Connect the key to the PC by the USB cable.
e) Be sure that the LED is steady red.
f) Verify the setting of the interface memorized by the PC.
g) During serial communication, the LED will flash every time that the master send a request.

Mode 13 – Dialogue between the key and a PC without (FF) filter
a) Set the dip switches as shown below

b) Be sure that the key is powered
c) Connect the key to the PC by the USB cable.
d) Be sure that the LED is steady red.
e) Verify the setting of the interface memorized by the PC.
f) During serial communication, the LED will flash every time that the master send a request.

Mode 14 – Dialogue between the key and a PC with (FF) filter
a) Set the dip switches as shown below

b) Be sure that the key is powered
c) Connect the key to the PC by the USB cable.
d) Be sure that the LED is steady red.
e) Verify the setting of the interface memorized by the PC.
f) During serial communication, the LED will flash every time that the master send a request.

DIP switch positions

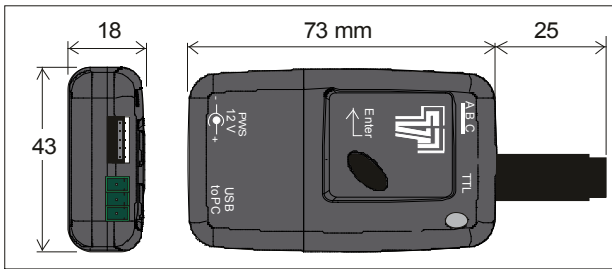| Mode	SW1	SW2	SW3	SW4	Function
1	OFF	ON	ON	ON	Firmware version detection
2	OFF	OFF	ON	ON	How to copy all parameters from an instrument to a key (Upload)
3	ON	ON	ON	ON	How to copy all data from a key to an instrument.
4	ON	OFF	ON	ON	Reserved
5	OFF	OFF	OFF	ON	How to copy the configuration only from a key to an instrument.
6	ON	OFF	OFF	ON	Reserved
7	ON	ON	OFF	ON	How to copy the program area only from a key to an instrument.
8	OFF	ON	OFF	ON	Reserved
9	ON	ON	ON	ON	How to copy from a key to another - A (master) key
	OFF	OFF	ON	ON	How to copy from a key to another - B (slave) key
10	ON	ON	ON	OFF	USB – RS 485 converter
11	OFF	ON	ON	OFF	USB – TTL converter without (FF) filter
12	ON	OFF	ON	OFF	USB – TTL converter with (FF) filter
13	OFF	ON	OFF	OFF	Dialogue between the key and a PC without (FF) filter
14	OFF	OFF	ON	OFF	Dialogue between the key and a PC with (FF) filter

2.7 Error messages

Func.	LED	Reason	Action
UP LOAD	**Red Flashing**	The transfer has been stopped and the key has not memorized the new configuration.	Verify the compatibility of the configuration memorized in the key with the connected instrument. Repeat the action.
DOWN LOAD	**Red flahing slow**	The transfer has been stopped and the instrument has not memorized the new configuration.	
DOWN LOAD	**Green flascing**	No configuration is memorized in the key	Load a configuration
DOWN LOAD	**Red flashing fast**	The condiguration memorized in the key is not compatible with the instrument connected.	Verify the compatibility

3. TECHNICAL DATA

Case: Plastic case self-estinguishing degree V0
according to UL94

Dimensions:

TTL Connector: JST S 5B-PH-KL - 2 mm
TTL female connector:
SAMTEC SQT-105-02-L-S - 2 mm
RS485 connector: Phoenix MC 1,5/3-G-3.5
USB connector type: Mini-USB
Pushbutton number: 1
LED: One two colour LED (red and green)
Power supply connector:
DC power Jack 1.3mm
Dip switch: 4 switch
Operative temperature:
from 0 to 50 °C (from 32 to 122 °F)
Storage temperature:
from -20 to + 70 °C (from -4 to 158 °F)
Humidity: da 20 a 80 % RH non condensing
Pollution degree: II

3.2 - Electrical data
External power supply

Power supply
The key can be powered in two different way according to the connected instrument type and of the action you desire.
The following table defines the necessary supply type in the various conditions.

Voltage: from 9V to 12 V DC.
Consumption: 150mA Max at 9V DC.
(Without instrument)
Connector: DC power Jack 1.3mm

RS 485 interface
Type: NOT isolated
Maximum cable length: 3 meters
Electrical levels: according to RS485 standard
Baud rate: from 1200 to 38400 baud
Parity: None
Byte format: 8 bit
Start Bit: 1
Stop Bit: 1

TTL interface
Type: NOT isolated
Maximum cable length: 3 meters
Electrical levels: 5V according to TTL standard
Baud rate: from 1200 to 38400 baud
Parity: None
Byte format: 8 bit
Start Bit: 1
Stop Bit: 1

USB interface
Type: 2.0

Memory dimension
The key's memory is divided in 2 areas:
 a) Memory area for configuration parameters
 b) Memory area for programs (or logging)
Both areas can memorize 500 parameters
maximum.

Instrument Family	PIN	Function	External PWS	Controller Supply
TLK 43 TLK 48	3	Copy from a key to an instrument	Yes	Yes
		Copy from an instrument to a key	Yes	Yes
		Copy from PC to instrument with a key (TTL)	Yes	Yes
		Copy from PC to instrument with a key (485)	Yes	Yes
Others and futures	5	Copy from a key to an instrument	Only one must be supplied	
		Copy from an instrument to a key	Only one must be supplied	
		Copy from PC to instrument with a key (TTL)	No	Yes
		Copy from PC to instrument with a key (485)	Yes	Yes
a key to a key or to a PC	5	From a key to another	One key only must be supplied	
		Copy from a key to a PC	Yes	--
		Copy from a PC to a key	Yes	--

In all cases both power supply are allowed.

4. - GENERAL NOTES

4.1 - PROPER USE
Every possible use not described in this manual must be consider as a improper use.
Tecnologic S.p.A. and its legal representatives do not assume any responsibility for any damage to people, things or animals deriving from violation, wrong or improper use or in any case not in compliance with the instrument's features.

4.2 - GUARANTEE AND REPAIRS
This product is under warranty against manufacturing flaws or faulty materials that are found within 12 months from delivery date.
The guarantee is limited to repairs or to the replacement of the instrument.
The tampering of the instrument or an improper use of the product will bring about the immediate withdrawal of the warranty's effects.
In the event of a faulty instrument, either within the period of warrantee, or further to its expiry, please contact our sales department to obtain authorisation for sending the instrument to our company.
The faulty product must be shipped to Tecnologic with a detailed description of the faults found, without any fees or charge for Tecnologic, except in the event of alternative agreements.

4.3 - MAINTENANCE
1) REMOVE POWER FROM THE POWER SUPPLY
2) Using a vacuum cleaner or a compressed air jet (max. 3 kg/cm2) remove all deposit of dust and dirt which may be present on the louvers of the connectors.
3) Remove the cover of the dip switches and, using an air jet, remove all deposit of dust and dirt which may be present on the internal circuits trying to be careful to not damage the electronic components.
4) To clean external plastic or rubber parts use only a cloth moistened with:
   - Ethyl Alcohol (pure or denatured) [C_2H_5OH] or
   - Isopropil Alcohol (pure or denatured) [$(CH_3)_2CHOH$] or
   - Water (H_2O)
5) Before using the key, be sure that it is perfectly dry.
7) re-insert the power supply jack.

4.4 - ORDERING CODE

A-01 *Universal Key*

Option	Code	Description
KEY	**A 01**	Universal Key
TTL connector	**3**	3 PIN
	5	5 PIN
AC adapter	**E**	230 V AC
	-	No
Configuration "Pack"	**S**	USB cable + CD + 485 connector
	-	None
Imballo	**-**	Standard
	N	Neutral
Manual	**-**	Without
	I	Italian
	E	English

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