# TDS-GSM

Ed.3.25

## User manual

EN

GSM remote control for variable-frequency drive.




toscano
electronics for the environment

## CONTENTS


1.INTRODUCTION ..... 1

2.INSTALLATION ..... 2

3.BUTTON FUNCTION ..... 6

4.LED INDICATORS ..... 8

5.CONFIGURATION VIA SMS MESSAGES ..... 10

6.QUICK SETUP MESSAGES ..... 19

7.QUICK MESSAGE GUIDE ..... 21

8.TECHNICAL CHARACTERISTICS ..... 23

9. QUICK SETUP GUIDE ..... 24

## WARNINGS

This manual contains necessary information regarding personal safety as well as for the prevention of material damage. Information for your personal safety is highlighted with a warning triangle; information to avoid only material damage is not marked with a warning triangle. According to the degree of danger, the instructions are represented, from greater to lesser danger, as follows. **DANGER** It means that failure to take adequate preventive measures will result in death or serious bodily injury. **WARNING** It means that failure to take adequate preventive measures can result in death or serious bodily injury. **CAUTION** with a warning triangle means that if appropriate preventive measures are not taken, personal injury may occur. **CAUTION** with no warning triangle means that if appropriate preventive measures are not taken, material damage may occur. **ATTENTION** means that an undesired result or state may occur if the corresponding safety instruction is not observed. If there are several levels of danger, the most stringent safety instruction is always used in each case. If a safety instruction with a warning triangle alerts to possible personal injury, the same instruction may also contain a warning about possible material damage. Qualified personnel The product/system described in this documentation may only be operated or handled by qualified personnel for the intended purpose and in compliance with the relevant documentation, in particular the safety instructions and warnings contained herein. Due to their training and experience, qualified personnel are able to recognise risks resulting from the handling or manipulation of these products/systems and to avoid possible dangers. Intended use of Toscano products. Consider the following: **WARNING** Toscano's products should only be used for the application situations foreseen in the catalogue and the associated technical documentation. If third-party products and components are used, they must be recommended or approved by Toscano. The correct and safe operation of the products requires that they have been transported, stored, installed, assembled, handled and maintained correctly. The permitted environmental conditions must be respected. The instructions and warnings in the associated documentation must also be followed. Trademarks All names are trademarks of Toscano Linea Electronica. Other names and designations contained herein may be trademarks whose use by third parties for their own purposes may violate the rights of their owners. Disclaimer We have checked the contents of this publication for compliance with the hardware and software described. However, as it is impossible to exclude deviations, we cannot be held responsible for full compliance. The contents of this publication are periodically reviewed; if necessary, possible corrections are included in the next edition.

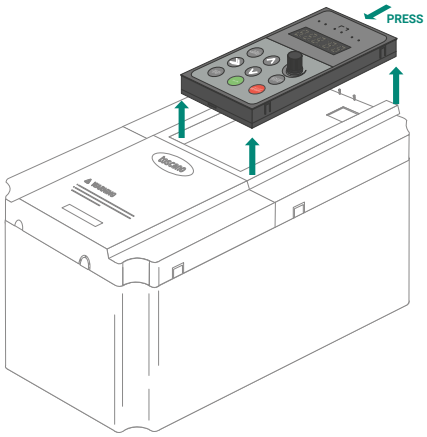
## 1.INTRODUCTION

The TDS-GSM is a control device specially designed to be used with the Toscano TDS 600 variable-frequency drive. This device will allow you to check, control and configure your variable-frequency drive installation remotely and easily using SMS messages. You are also able to make the necessary adjustments when you are close to the installation but cannot access the configuration panel thanks to Bluetooth connectivity and the TDS drives app.

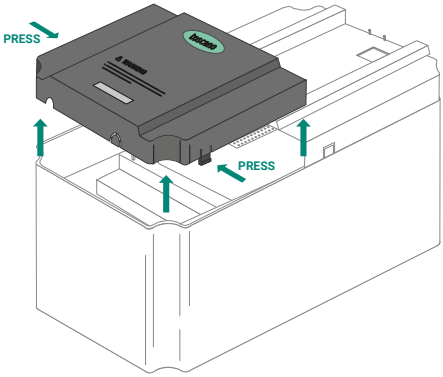
## 2.INSTALLATION

To carry out the installation, the **variable-frequency drive must be completely disconnected from any power supply**. This can be easily done by following these steps:

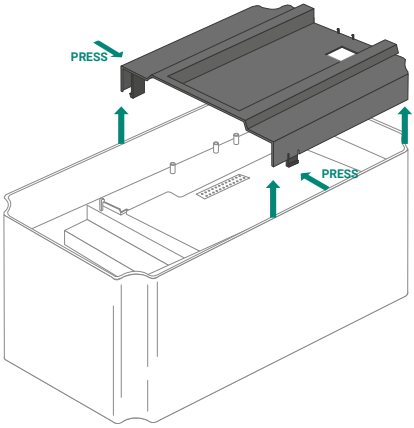
**1** Remove the **control board**.



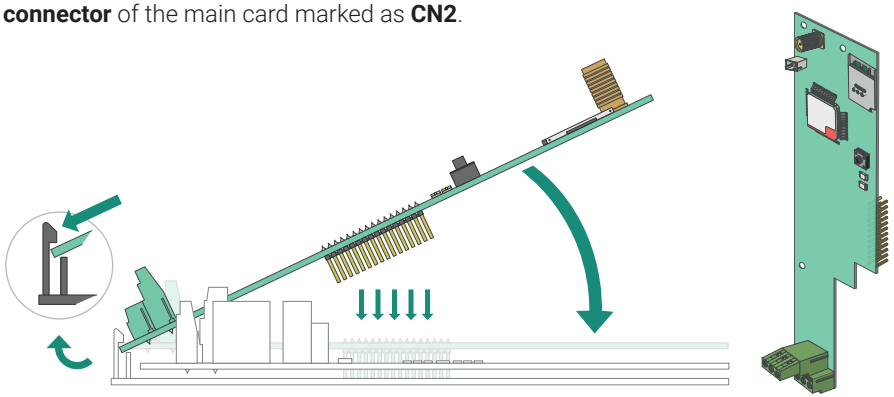

**2** Remove the **bottom cover**.

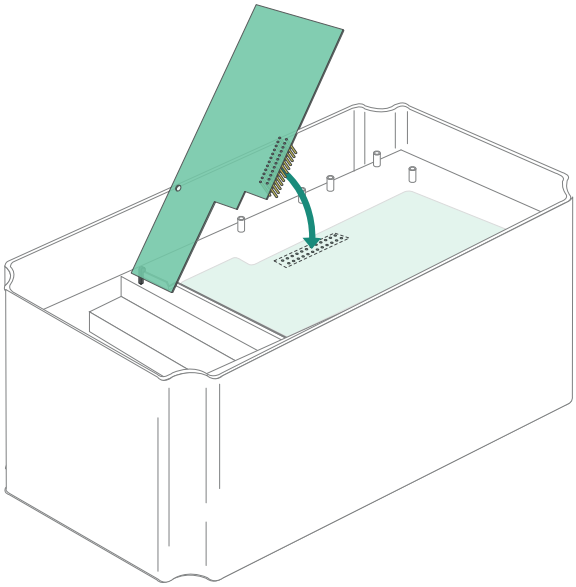



**3** Remove the **top cover**.

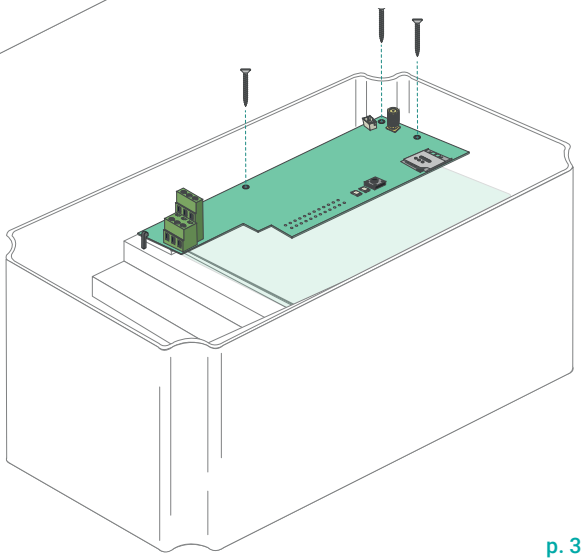


**4 Insert the TDS-GSM card** by resting it on the lower tab and lining up the connection pins **on the connector** of the main card marked as **CN2**.

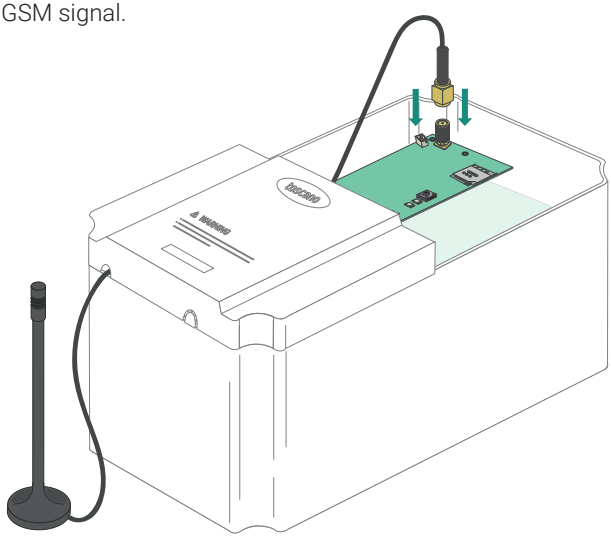




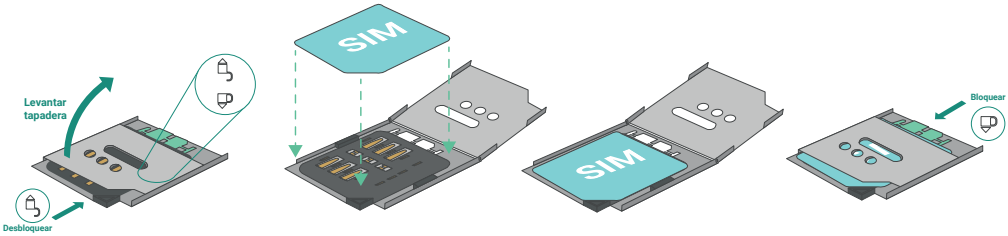
**5 Screw** the TDS-GSM card to the TDS 600 variable-frequency drive housing using the screws provided.



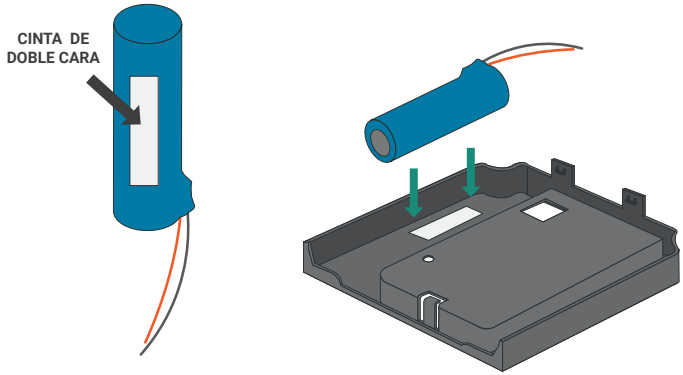
**6 Connect the Communication Antenna Terminal** to the port that is indicated, **pull the cable out through the lower left tab** and position the antenna in a place where you can have good reception of the GSM signal.



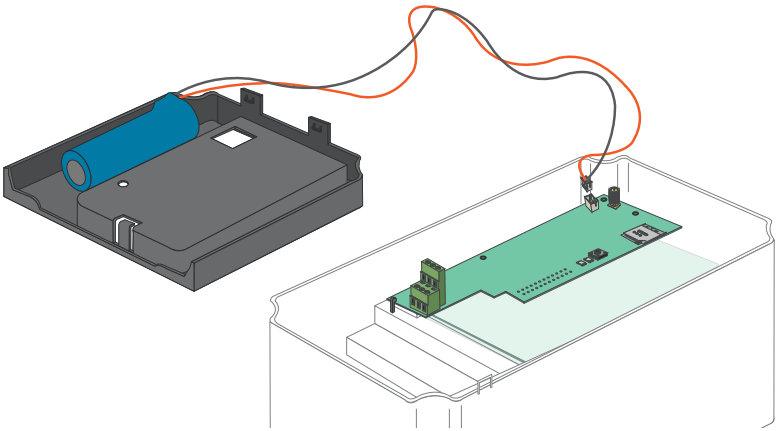
**7** Insert the SIM card into the socket



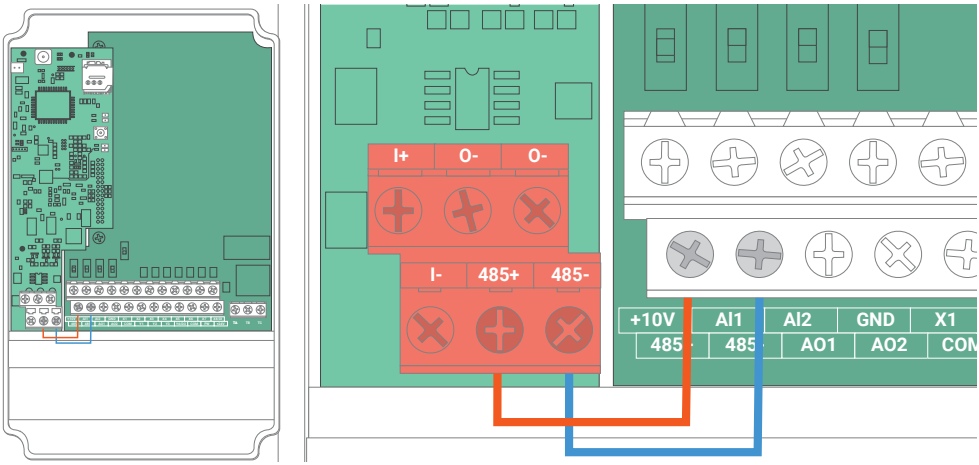

**8 Attach the battery to the left hand side** when you take the top cover off and look out the back of it. **Usethe double-sided adhesive tape included** next to the product to do so.



**9 Connect the battery** to the indicated connector. **The battery connector only goes in one position** so **should not be forced** if it doesn't go in. Make sure that it is inserted in the correct position or it could cause irreparable damage your TDS-GSM module.



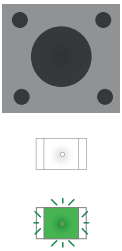
**10** Make the connections.




**11** Replace the top and bottom covers and the control panel. You may now switch on your variable-frequency drive.

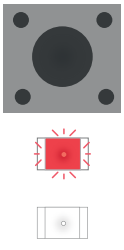
## 3. BUTTON FUNCTION

On your TDS-GSM, the button is multi-functional and will allow you to change the output status or modify different operating options according to the duration of pressing. A short press will allow you to change the status of the external output. If you hold it down for more than three seconds, the LEDs will start a sequence of flashes, indicating which function will be performed if the button is released at that point. The available options are:



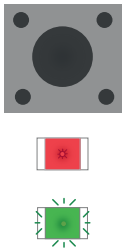
Red off
Green flashing

**Reserved**



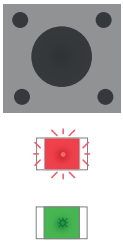
Red flashing
Green off

**Bluetooth**



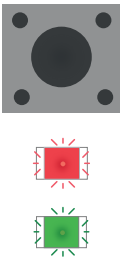
Red on
Green flashing

**Reserved**



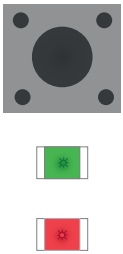
Red flashing
Green on

**Update**



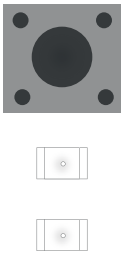
Red flashing
Green flashing

**Switched off**



Red on
Green on

**Exit the menu**



Red off
Green off

**Reset**

**Reserved**
Reserved for future use.

**Bluetooth**
Turns bluetooth connectivity on or off. When you release the button on this option, it will remain on to indicate that bluetooth connectivity has been activated or it will flash faster to indicate that it has been deactivated. After enabling or disabling bluetooth connectivity, your TDS-GSM will restart.

**Update**
Selecting this option will activate update mode, which allows you to update the firmware of your TDS-GSM.

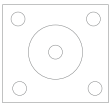
**Switched off**
This option allows you to turn off your unit.

**Exit the menu**
This option allows you to exit the menu.

**Reset**
Keep pressing the button while both LEDs remain on, and when they switch off, your unit will reset.

**Delete the configuration**
If you wish to clear the settings on your TDS-GSM and return to the factory settings, you must continue to hold the button down while your unit switches on. When the LEDs start flashing on and off quickly, it means that the settings are cleared. Once this is done, your unit will restart.

## 4.LED INDICATORS

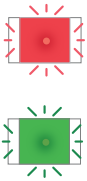


LED1 (red)

LED2 (green)

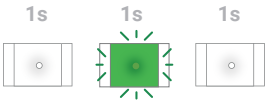
### 1. START-UP:

LEDs 1 and 2 flash simultaneously while your TDS-GSM is being started.

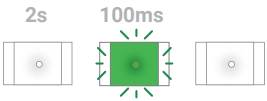


### 2. Connecting to the GSM network:

LED2 will be on for 1 second and will remain off for another second indicating that an attempt is being made to connect to the GSM network.




LED2 will remain off for 2 seconds and will light up for 100ms to indicate that it has connected to and registered the GSM network. At this time your TDS-GSM is ready to receive calls and messages and to send alerts if any fault is detected.



### 3. Sending or receiving message:

Sending or receiving message: LED2 will flash rapidly (250ms on, 250ms off) indicating that a message is being received or sent or a call is being received.




### 4. Fault detected:

Fault detected: LED1 will remain off as long as no fault has been detected. When your variable-frequency drive indicates a fault, a rapid flash will occur every 2 seconds indicating that a fault has been detected. You can check the fault messages generated by your variable-frequency drive by sending a text message.



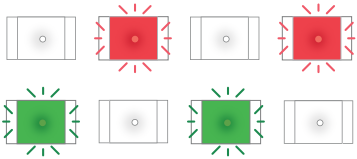

### 5. Variable-frequency drive blocked:

Variable-frequency drive blocked: LED1 will remain on if a situation has been detected where your variable-frequency drive needs to receive a fault reset.




### 6. Restoring:

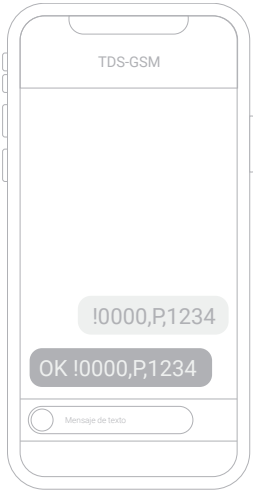
Restoring: LED1 and LED2 will flash alternately when the TDS-GSM module is being restored to factory settings.



## 5.CONFIGURATION VIA SMS MESSAGES

Configuration via sms messages is very useful when you do not have a bluetooth connection or are not close to your TDS-GSM. To perform an installation from scratch via sms messages, your SIM card must have the pin deactivated. To do this, you must insert it into your mobile phone and follow the instructions of your operating system to deactivate it.

### PASSWORD change message: !CCCC,**P**,NNNN

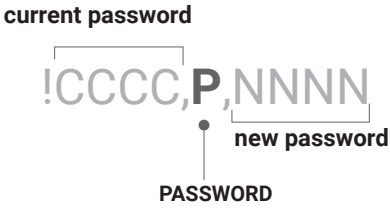



The password 0000 is set at the factory and must be changed on the first use, by sending the message, in order to be able to access all functions. The phone that changes the password for the first time will be added as an administrator phone.

**E.g.:**

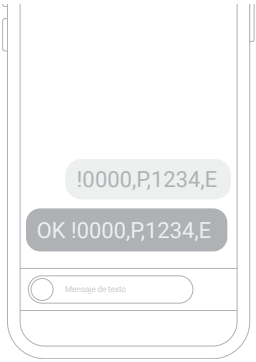
User: !0000,P,1234

TDS-GSM: OK !0000,P,1234




Password change message, where CCCC represents the current device password and NNNN the new password. TDS-GSM will reply with the new password.

There is an option that allows you to specify the language for the messages, by adding one of the following codes to this message:




S Spanish
E English

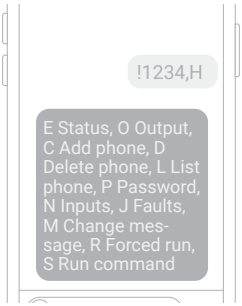
If you do not indicate a code, the messages will appear in Spanish by default. If, for example, you want the messages to appear in English, you will have to send the following message:

**E.g.:**

User: !0000,P,1234,E

TDS-GSM: OK !0000,P,1234,E

## HELP message: !CCCC,H



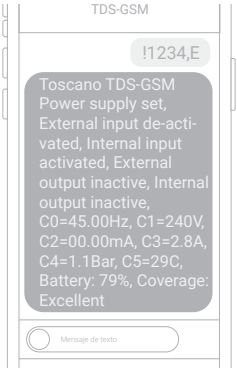

Returns a message with the available control messages.

**E.g.:**

User: !1234,H

TDS-GSM: E Status, O Output, C Add phone, D Delete phone, L List phone, P Password, N Inputs, J Faults, M Change message, R Forced run, S Run command

## STATUS Message: !CCCC,E




Returns a message with the general status of your TDS-GSM, its power status, the status of its inputs and outputs, coverage and battery level and the value of the C parameters of your variable-frequency drive.

**E.g.:**

User: !1234,E

TDS-GSM: Toscano TDS-GSM Power supply set, External input de-activated, Internal input activated, External output inactive, Internal output inactive, C0=45.00Hz, C1=240V, C2=00.00mA, C3=2.8A, C4=1.1Bar, C5=29C, Battery: 79%, Coverage: Excellent

**Message to ADD an AUTHORISED PHONE number:** !CCCC,**C,**<phone>,<type>, <Alerts>

Add an authorised phone number, if the type parameter is not specified or is N, it will be added as a normal user. If the type parameter is A, it will be added as an administrator user. Only the administrator users can add other authorised phone numbers, delete errors or force the run command. By default the first user who changes the password when installing your TDS-GSM will be added to the list of administrators. The alert parameter indicates the alerts that are active for this phone. The alert codes are as follows:

E TDS-GSM External Input
O TDS-GSM External Output
P Power supply
R Run
S Stopped
F Fault

If no alert code is indicated, they will all be set, by default. If you wish to activate only a few codes, you must indicate them by adding them to your message.




For example, if you want to add the phone 666777888 to the list of administrators, along with only the Start-up and Fault alarms, you need to send the following message:

**E.g.:**

User: !1234,C,666777888,A,R,F

TDS-GSM: OK !1234,C,666777888,A,R,F

**Message to DELETE an AUTHORISED PHONE number:** !CCCC,**D,**<telephone>




Remove one of the authorised phones.

**E.g.:**

User: !1234,D,678876678

TDS-GSM: OK,D,678876678

## Message to LIST registered phones and activated alerts: !CCCC,L



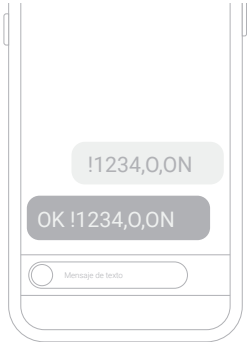

It returns a message with the registered phones and the active alarms for each of them.

**E.g.:**

User: !1234,L

TDS-GSM: 678876678, 1245, J
678678678, J

## Message to change the output: !CCCC,O,ON/OFF



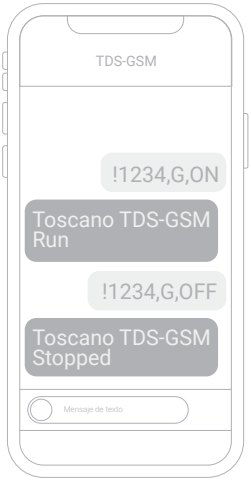

This message allows you to change the status of the output of your TDS-GSM. The output code must be I for the internal output and E for the external output. ON must be added to activate it or OFF to deactivate it.
For example, if you want to activate the output of your TDS-GSM, you need to send the following message:

**E.g.:**

User: !1234,O,ON

TDS-GSM: OK !1234,O,ON

## Run command message: !CCCC,G, ON/OFF




This message allows you to give a run command remotely

**To activate the run command: !CCCC,G,ON**

**E.g.:**
User: !1234,G,ON

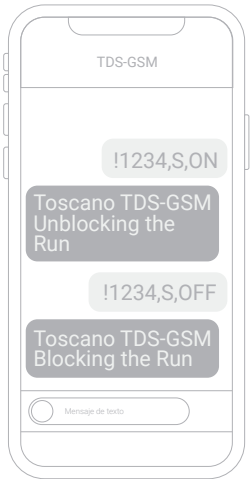
TDS-GSM: Toscano TDS-GSM Run

**To de-activate the run command: !CCCC,G,OFF**

**E.g.:**
User: !1234,S,OFF

TDS-GSM: Toscano TDS-GSM Stopped

## **Message to block the run command:** !CCCC,**S**,<ON/OFF>




Activate or de-activate the block on your variable-frequency drive's run command. Activates the run command and allows your variable-frequency drive to run, providing the conditions for operation are met, i.e. if the command is given via digital input, with mains voltage, pressure, etc..

**To unblock the run command:** !CCCC,**S,ON**

**E.g.:**
User: !1234,S,ON

TDS-GSM: Toscano TDS-GSM Unblocking the Run

**To block the run command:** !CCCC,**S,OFF**

**E.g.:**
User: !1234,S,OFF

TDS-GSM: Toscano TDS-GSM Blocking the Run

## **ALERTS message:** !CCCC,**A**,<alert>

Each of the alerts can be activated or deactivated separately for each authorized phone. Modifies the alerts for the phone from which the message is sent. To activate an alert add the + symbol and the alert code, and to deactivate it add the - symbol and the alert code. The available alert codes are:

| | |
|---|---|
| E | TDS-GSM External Input |
| O | TDS-GSM External Output |
| P | Power supply |
| R | Run |
| S | Stopped |
| F | Fault |



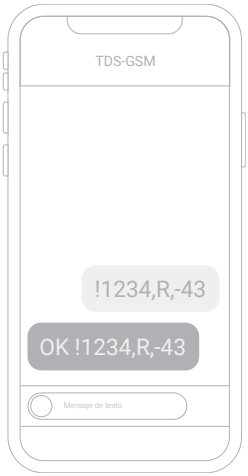

You can send several codes in a row within the same message. For example, if you want to activate the external input and fault alerts and deactivate the stop alert, you need to send the following message:

**E.g.:**

User: !1234,A,+E,+F,-S

TDS-GSM: OK !1234,A,+E,+F,-S

## **FORCED RUN message:** !CCCC,**R**,<frequency>/OFF




This message allows you to set up a forced run on your variable-frequency drive. <frequency> is the frequency that you want to set on your variable-frequency drive. If a negative frequency is indicated, it will run in reverse. If you wish to de-activate the forced run, you need to add OFF.

For example, if you want to activate a forced run in reverse at 43Hz, you need to send the following message:

**E.g.:**

User: !1234,R,-43

TDS-GSM: OK !1234,R,-43

In addition, if the start-up alerts have been activated, your TDS-GSM will send you that message.

## FAULTS message: !CCCC,J




Your TDS-GSM will continuously check the operation of your variable-frequency drive. If a fault is detected, the details of the drive's status when the fault occurred will be stored in memory
This message allows you to check the faults that have been detected during the operation of your variable-frequency drive, along with the details of each fault. You can also clear the list of stored faults.

**List the stored messages: !CCCC,J**

**E.g.:**

User: !1234,J

TDS- GSM: Toscano TDS-GSM 1: E-41, 2: E-08, 3: E-41, 4, E-10

Check the details of one of the records: !CCCC,J,<record>
This will show you details about the operation of your variable-frequency drive at the time when the fault occurred. The message includes the time and date, fault code, current frequency, setpoint frequency, output current, output voltage, temperature, status of digital inputs and operating time.



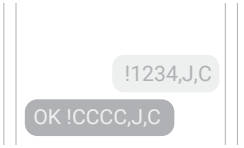

**Check the details of one of the records: !CCCC,J,<record>**

**E.g.:**

User: !1234,J,1

TDS- GSM: Toscano TDS-GSM 19:13 13/01/20 E-41 40.05Hz, 50.00Hz, 10A, 220V, 40C, 0, 20m

**Delete the list of fault records: !CCCC,J,C**




**E.g.:**

User: !1234,J,C

TDS-GSM: OK !1234,J,C

## PARAMETER CHECK message: !CCCC,FXX.XX




Sends a message with the parameter assigned to the function FXX.XX

**E.g.:**

User: !1234,F00.16

TDS-GSM: F00.16=1

If you wish to check more than one parameter, you can do so in the same message by separating them with commas.

## PARAMETER MODIFICATION message: !CCCC,FXX.XX=<value>




Sends a message with the parameter assigned to the function FXX.XX

**E.g.:**

User: !1234,F00.16=2

TDS-GSM: OK,F00.16=2

If you wish to modify more than one parameter, you can do so in the same message by separating them with commas.

## Message to show DIGITAL AND ANALOGUE INPUTS: !CCCC,N



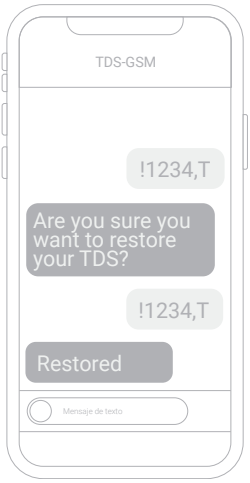

Returns a message with the status of the digital and analogue inputs.

**E.g.:**

User: !1234,N

TDS-GSM: OK,N, X1=1,X2=1,X3=0,X4=0,
X5=1,X6=0,X7=0,X8=0,AI1=0,AI2=12

## Message to RESTORE your VARIABLE-FREQUENCY DRIVE: !CCCC,T




This message allows you to reset your TDS600 variable-frequency drive to its factory settings, removing all of your settings and parameters. To carry out the factory reset, you need to send the message twice, for safety reasons. The first time you send the message, you will receive a message asking if you are sure you want to restore the factory settings. If, within 5 minutes of receiving this message, you send the reset message again, the variable-frequency drive will be reset to the factory settings.

**E.g.:**

User: !1234,T

TDS-GSM: Are you sure you want to restore your TDS?

User: !1234,T

TDS-GSM: Restored

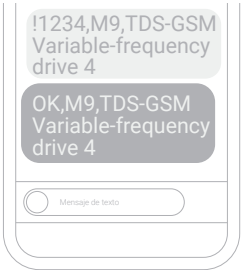
**Notes:** If when sending any message you include ***** at the end of the message, GSM will perform the action indicated in the message but **will not return any confirmation message after the action is performed.**

**Message to change the alarm messages:** !CCCC,**Mx**,<message>

* In the field <message> you must enter the message you want the TDS-GSM to send when any of the alarms are detected and to indicate the general status of the device.

The code **Mx** represents the various alarm messages which are identified in the table below, along with the default recorded messages.

| | | |
|---|---|---|
| **M1** | Reserved | |
| **M2** | Reserved | |
| **M3** | External input activation alarm. | External Input Activated |
| **M4** | External input de-activation alarm. | External Input De-activated |
| **M5** | Power failure alarm | Power Supply De-activated |
| **M6** | Power restoration alarm | Power Supply Activated |
| **M7** | Reserved | |
| **M8** | Reserved | |
| **M9** | Message identifying your TDS-GSM | Toscano TDS-GSM |




**E.g.:**

User: !1234,M9,TDS-GSM Variable-frequency drive 4

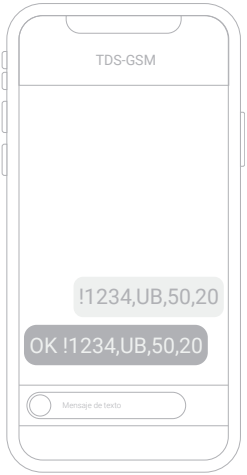
TDS-GSM: OK,M9,TDS-GSM Variable-frequency drive 4

## 6.QUICK SETUP MESSAGES

These messages establish the Quick Setup Guide configuration, meaning that you don't have to send all F functions individually.

### GENERAL CONTROL Message from the VARIABLE-FREQUENCY DRIVE: !CCCC,**UB,**<FMAX>,<FMIN>

This message configures the General Control of the Variable-Frequency Drive, by changing the following parameters:




F00.23 = 1
F01.04 = FMAX
F01.11 = FMAX
F01.12 = MIN
F01.15 = 1
F08.18 = 1
F01.17 = 100
F01.18 = 100

For example, if you want to set a maximum frequency of 50 Hz and a minimum frequency of 20 Hz, the following message must be sent:

**E.g.:**

User: !1234,UB,50,20

TDS-GSM: OK !1234,UB,50,20

### Message with basic DATA from the MOTOR: !CCCC,**UM,**<P>,<V>,<I>,<F>,<S>,<N>




This message configures the basic motor parameters indicated, where P is the nominal power in kW, V is the nominal voltage, I is the nominal current, F is the nominal frequency, V is the nominal speed and N is the number of pole pairs that the motor has.

For example if you want to configure a motor with the following characteristics:
3kW, 240V, 13A, 50Hz, 2820rpm and one pair of poles, you need to send the following message:

**E.g.:**

User: !1234,UM,3,240,13,50,2820

TDS-GSM: OK !1234,UM,3,240,13,50,2820

## SOLAR APPLICATION Message: !CCCC,**US**,<D>,<O>,<M>,<R>,<V>




This message activates and configures the solar pump mode using the indicated parameters, where D is the wake-up voltage, O is the sleep voltage, M is the minimum frequency, R is the wake-up delay and V is the nominal voltage. In addition to setting these parameters, it will also assign the other parameters from the Quick Guide, from Special Applications: Solar

For example, if you want to activate the solar application on your variable-frequency drive with the following configuration: 290V wake-up voltage, 200V sleep voltage, 25Hz minimum frequency, 600s wake-up delay and 310V nominal voltage, you need to send the following message:

**E.g.:**

User: !1234,US,290,200,25,600,310

TDS-GSM: OK !1234,US,290,200,25,600,310

## 7.QUICK MESSAGE GUIDE

### Possible messages

| SMS | ACTION |
|---|---|
| !CCCC,**P**,NNNN | Changes password |
| !CCCC,**H** | Help message with available options |
| !CCCC,**E** | Status message |
| **!CCCC,C,**<phone>,<type>, <alerts> | Adding an authorised phone number |
| **!CCCC,D,**<telephone> | Deleting an authorised phone number |
| !CCCC,**L** | List registered telephones and activated alerts |
| !CCCC,**O**,ON/OFF | Message to change the output |
| !CCCC,**G**,ON/OFF | Run command |
| !CCCC,**S**,ON/OFF | Run block |
| !CCCC,**A,**<alert> | Alert message |
| !CCCC,**R,**<frequency>/OFF | Forced run message |
| !CCCC,**J** | Listing stored messages |
| !CCCC,**J,**<record> | Checking the details of one of the records |
| !CCCC,**J,*C*** | Deleting the list of fault records |
| !CCCC,FXX.XX | Check parameter |
| !CCCC,FXX.XX=<value> | Modification of parameter |
| !CCCC,**N** | Showing digital and analogue inputs |
| !CCCC,**T** | Resetting the variable-frequency drive |

## Quick Configuration Messages

| SMS | MEANING |
|---|---|
| !CCCC,**UB**<FMAX>,<FMIN> | General control of the variable-frequency drive |
| !CCCC,**UM,**<P>,<V>,<I>,<F>,<S>,<N> | Basic data about the motor |
| !CCCC,**US,**<D>,<O>,<M>,<R>,<V> | Solar application |

## General Response Messages

| SMS | MEANING |
|---|---|
| FULL MEMORY | When you try to enter more than 10 phone numbers. |
| OK | The instruction has been accepted correctly |
| ERROR | The request could not be properly addressed or the message was not understood |
| FXX.XX=YYYY | The function FXX.XX now has the parameter YYYY |

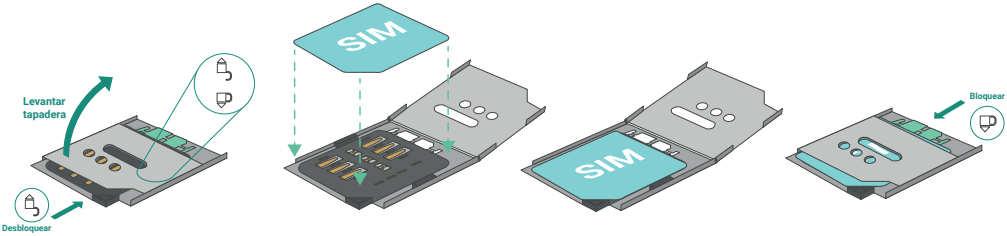
## 8.TECHNICAL CHARACTERISTICS

| |
|---|
| 1 External digital input |
| 1 External digital output |
| up to 10 phone numbers |
| Independently configurable alerts |
| Customisable alert messages |

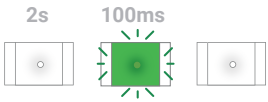
| | |
|---|---|
| Processor | ARM Cortex-M4 |
| Battery | Li-Ion 3.7V 1800mAh |
| Communications | RS-485 |
| Maximum power usage | 10W |
| Operating temperature | -10...+70ºC |
| External antenna connector | SMA |
| Indicators | Red and green LEDs |
| Protection level | IP20 |
| Type of digital input | Optocoupled, Diode |
| Max. digital input voltage | 24V |
| Max. digital input current | 3mA |
| Type of digital output | Optocoupled NPN transistor |
| Max. digital output voltage | 30V |
| Max. digital output current | 150mA |

## 9. QUICK SETUP GUIDE

**1.** Follow the Installation steps in point 2 of this manual, making sure that the inserted SIM card does not have a PIN.




**2.** Wait for your TDS-GSM to connect to the network, i.e. when the green LED changes from flashing every 1s to flashing briefly every 2 seconds



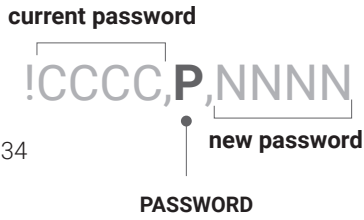

**3.** Send the message !0000,P,1234, where 1234 should be changed to a four number or letter password of your choice (for example: AEDC, 1d3c, 4Dg8...)




**E.g.:**

User: !0000,P,1234

TDS-GSM: OK,0000,P,1234




**4.** Send the message !1234,O,ON when you want to activate the output and the message !1234,O,OFF when you want to deactivate the output.




**E.g.:**

User: !1234,O,ON

TDS-GSM: Toscano TDS-GSM, active output

**5.** Send the message !1234,G,ON to give the run command to your variable-frequency drive remotely and the message !1234,G,OFF to remove the run command that was given remotely.




**E.g.:**
User: !1234,G,ON

TDS-GSM: Toscano TDS-GSM Run

**To de-activate the run command:** !CCCC,**G,OFF**

**E.g.:**
User: !1234,S,OFF

TDS-GSM: Toscano TDS-GSM Stopped

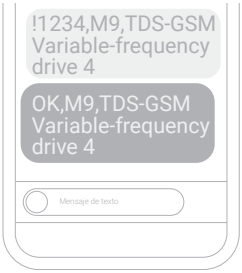
**6.** Send the message !1234,F15.01 to check the power configuration for the motor on your variable-frequency drive.




**E.g.:**
User: !1234,F15.01

TDS-GSM: Toscano TDS-GSM F15.01=10

**7.** If you want to customise your equipment name, send the message !1234,M9,new_name where you must replace new_name with the name you want to give to your equipment.




**E.g.:**

User: !1234,M9,TDS-GSM Variable-frequency drive 4

TDS-GSM: OK,M9,TDS-GSM Variable-frequency drive 4

## NOTES

Code 50019543

**Toscano Línea Electrónica, S.L.**
P.I. La Isla c/Río Viejo, 50 - 41700 - Dos Hermanas - SEVILLA - SPAIN - (+34) 954 999 900 -
www.toscano.es - info@toscano.es

toscano
electronics for the environment