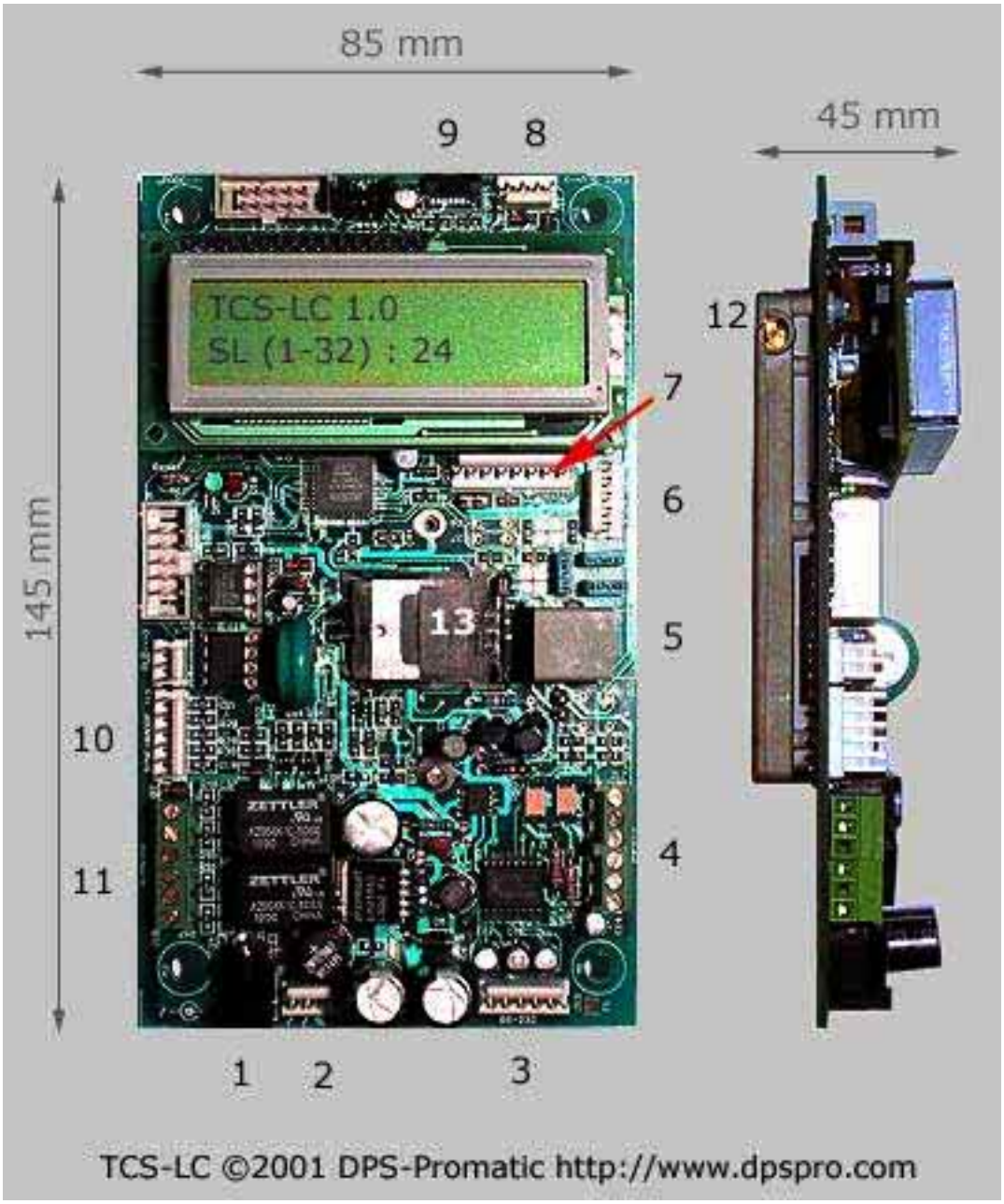
TCS-LC Instructions version 1.0
Supplement to TCS 3.0 Instruction manual



This is an addition to TCS 3.0 instructions, showing TCS-LC specific commands and main differences between the 2 boards.
To understand properly the content os this addendum it is necessary to be familiar with TCS 3.0 user manual.

Table of contents

Disclaimer: read carefully

This board is designed to control remote devices using the GSM network by means of SMS messages.

Though GSM networks are usually reliable you should never annume that they or our board are always working as they are expected to.

You should never design a critical system based on the reliability of our board and/or the GSM networks.

In particular, even if SMS messages are delivered almost always, still there are times when they are not delivered at all and others in which they may arrive with minutes and even hours of delay.

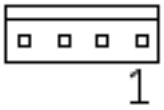
You should take this in consideration when designing your system.

We will never accept any responsibility other then repairing a board that proves to be defective.

You must be experienced in electronics to use this board properly. If you are not we receommend that you ask somebody who is to assist you before you attempt to connect it. Any damage caused by improper usage is not covered by any warranty.

Connectors description:

Pin 1 is always the righmost PIN looking at the connector from the front.
Example: 4 pin Power connector



List of TCS-LC connectors with numbers appearing in picture
1-Power Adapter receptacle, 12-24 VAC or 12-35 VDC (+ is the center lead)
2-Secondary Power connector

1=12V Output
2=GND
3=VAC(or + VDC)
4=VAC

How to make connections:
For AC power connect transformer between pin 3 and 4.
For DC power connect + to pin 3 and GND to pin 2.
In either cases pin 1 is the 12V output from the board rectifier, you can use it to power external devices up to a maximum os 200 ma.

3-RS232 interface

1-GND
2-TX (output)
3-RX (input)

If you have bought the board in a Box, this connector is attached to a 9 PIN DSUB Male connector with the following pinout:

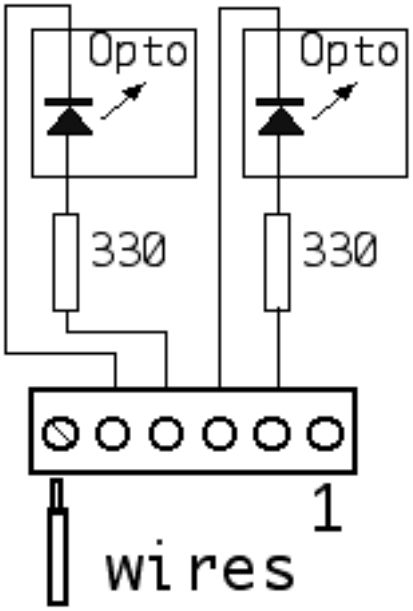
2-RX (input)
3-TX (output)
5-GND

To connect to a PC you ned a 9 pin to 9 pin DSUB serial cable Male to Male
with pin 2 to 3 and 3 to 2. This cable is a standard market item and we supply this cable as an option, on request.

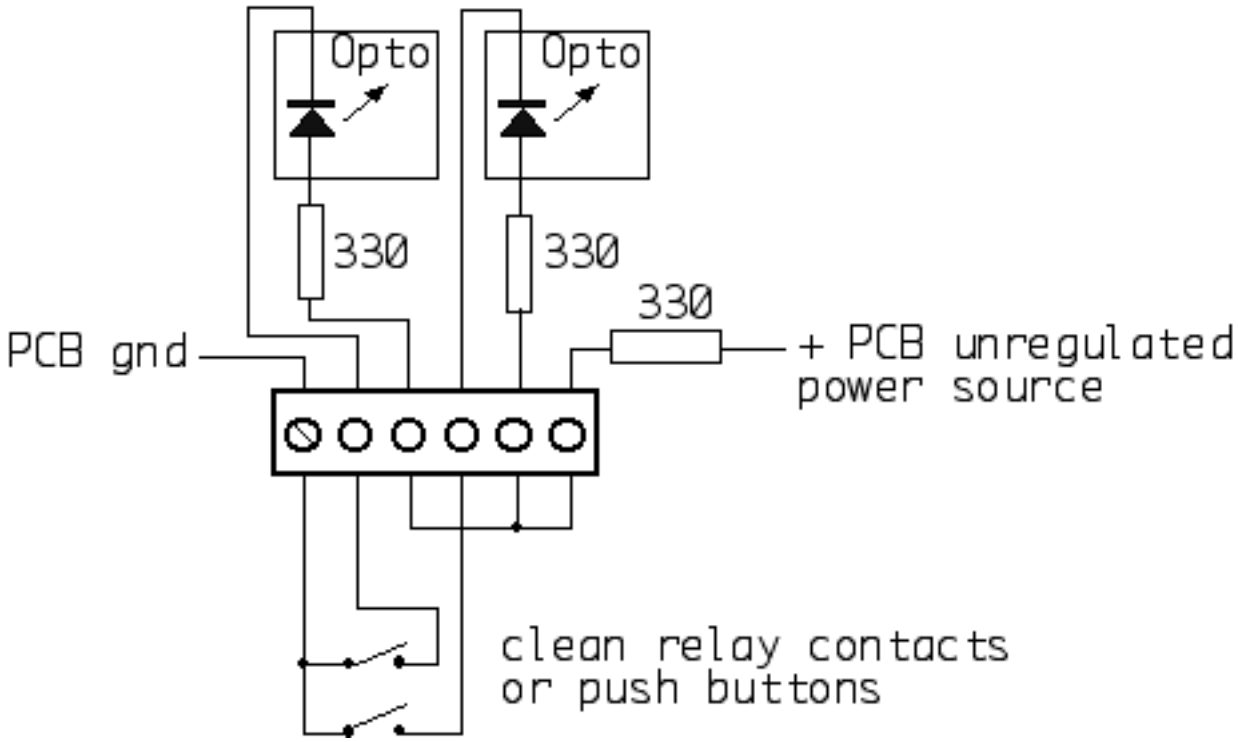
4-Inputs

1- +Unreg
2- + INPUT 1
3- - INPUT 1
4- + INPUT 2
5- - INPUT 2
6- gnd

Inputs are connected to Optocouplers whose LED are powered through a 330 Ohm resistor.
You can connect directly from 3 to 12V.
For higher voltages put an external resistor in series.
For 24V you should put a 1000 Ohm 1/2 W resistor in series.



If your device can't source current and you want to connect the inputs to a simple clean contact you may use the +unreg power output provided on on pin 1 of the connector and arrange your connections in a way similar to the picture below:



5-Handset receptacle: Not available on standard versions
6-Executive Master connector: Not availabel on standad versions
7-Keyboard: Not available on standard versions
8-Executive Slave conncetor: Not available on standard versions
9-IRDA option: Not available on standard versions
10-Sync Serial interface: reserved for future use

11- Output Connector: connects low power (max 48V 500 ma) relay contacts.

1-Relay 1 Common
2-Relay 1 Normaly Closed
3-Relay 1 Normally Open
4-Relay 2 Common
5-Relay 2 Normaly Closed
6-Relay 2 Normally Open

You can connect only low voltages, up to 48 V and low power, ut to 500 ma to these contacts. If you need to drive bigger loads, you should use this relay to drive another bigger relay.

If you have the AA battery pack option, Relay 1 is used to switch off the board after a programmable amount of time.
This function can be inhibited and the output regained choosing a specific configuration in the programming menu. See it for more details.

TCS LC functions.

TCS LC can perform I/O functions similar to the TCS 3.0 except that it has 2 I/O instead of 8.
It also has some specific commands via SMS an some functions are programmed in a slightly different way.

When you switch on the TCS-LC the LCD display will show various details,including RF signal strength (from 0 to 32).

The TCS-LC board has been designed for specific applications in the Vending Machines industry and for other types of remote management. If you have an application that requires special specifications let us know and we will be glad to evaluate it.

If somebody is familiar with the TCS 3.0 it will find it easy to adapt to TCS-LC.
For this reason we recommend that you read the TCS 3.0 instruction manual, also avilable on line on our site http;//www.dpspro.com before reading this set of specifc information about the TCS-LC unit.

.

List of TCS-LC commands available by SMS

Commands in bold are available only on TCS-LC

#ACL[01..64][Phone number (max 10 char.)]

Add GSM Phone number to the access list in position 01-64

This TCS-LC specific command lets program the White List by means of SMS messages. Of course it is much easier to do it with a PC. Hint:To erase a number simply write the new one in its place.

#ALR[ON/OFF] Enable/disable[ON/OFF] ALERT

#ATC

AT command to GSM module

This TCS-LC specific command lets you route an AT command to the GSM module for special technical purposes.

#CAP[old password] [new password]
Change Administrator password

#CLB [Data Phone number]

Call back Function

This TCS-LC specific command is very convenient with Telcom operators that allow a SIM to place a data call but want more money to allow it to receive it, becasue in that case they have to assign a second number. Is you send an SMS with the #CLB command and a data number to call, the TCS-LC will call back that number. This is very convenient to set sold TCS remotely without paying (the TCS-LC pays).

#CLK [hh mm ss dd mm yyyy]
Set clock by sms

#COM [string]
Route string to RS232 port

#DDC

Next Data Call is for the TCL-OS menu

This TCS-LC specific command is needed because the TCS-LC can enable direct connection between PC on the RS232 port and the GSM module.As a default settng, any incoming DATA Call is routed directly to the Modem. If the DDC command has been received, the NEXT Data call will be interpreted and will permit to enter the TCS-OS Menu. This command has a 5 minutes timeout, this means that you must place a data call within 5 minutes.

#EPW[ON/OFF]
Enable/disable[ON/OFF] power alarm

#ETF[ON/OFF] Enable/Disable[ON/OFF] THEFT Volume alarm
This TCS-LC command is available only on the special VR version.

#GTP
Get temperature value
Only on TCS 3.0

#GIO
Get input/output Status

#GSM[1..8][GSM number]
Store GSM numbers [1..8] list for alarms.

#INI
Initialize system
*** WARNING: command resets all parameters!

#MTX[1..8][x,x,x,x,x,x,x,x]
Program Input-to-Gsm Matrix; 'x' must be 0..8
This TCS-LC specific command allows programming by SMS of the Alarm to GSM number matrix.

#NOA
Do not send return sms for command acknowledgment

#OUT[1..2],T (seconds);
if T is omitted, Output will stay ON undefinitely

#PAUx Pause x/2 seconds (only after #OUT command)

#PIN[SIM PIN code 4 char] Store SIM PIN code

#PWD[password] Administrator or User password

#RES System reset and restart

#SCA[SCA number] Store SMS service center number

#SID[identify string(max 10 char)]

Store ID string

This TCS-LC specific command enables programming of TCS ID that appears on SMS message.

#SIO[string] Route string to sync serial

#SLM[ON/OFF]

Enable/disable[ON/OFF] Silent mode

This TCS-LC specific command disables all beeps and display messages when TCS-LC receives or sends commands.

#SMS[1..2][message (max 39 char)]

Store message for input 1 or 2.
Maximum lenght is 39 characters on TCS-LC

#SCT Syncronize clock with GSM network

List of TCS-LC commands available by MENU

You can access TCS-LC programming menu in the following ways:

1-use the TCS-Logger software provided on a CD, install it on your PC and connect the serial port to the TCS-LC
2-use any communication software like Hyperterminal, configured 8bit,NO parity,1 Stop bit,9600 Baud and connect the serial port of your PC to the TCS-LC
3-Place a data call to TCS-LC or use the SMS #CLB command to get a call back call

If you have a PC connected in either of the above ways, when you power up the TCS-LC you will read the following string:

```
Power Up: Th 15:56.02 25/07/2002
```

At this point you should press enter on your PC keyboard and you should see

```
Hello
```

Try to press it a few times (don't keep it pressed) until you see the hello message...

```
Hello
```

When you see it, enter **menu** in small case letters, TCS-LC menu will appear prompting for a password, that you will input, to get the full menu as shownbelow.

```
DPS-Promatic
TCL-OS STD 1.01
Insert password :******
TCL-OS STD 1.01
Setup menu
1) Clock
2) SMS
3) INPUT
4) LCD Display Message
6) Power Alarm
7) Security
8) Voice call options
E) Exit
```

TCS-LC Submenus

Here are all the submenus as they appear while you use them. If we write **E** we mean it. **E** and **e** are different letters. **MENU** and **menu** are different strings.

1-Clock

Use this menu to set the real time clock

```
Current time: Th 15:56.11 25/07/2002
1) Set clock
E) Exit
```

2-SMS

Use this menu to program SMS related parameters

```
SMS - Message Service
1) SCA - Service Centre Address
2) GSM - GSM destination numbers
3) SMS - Messages
4) SMS - Counters
5) SMS Serial number
6) TCL ID (10 char max)
E) Exit
```

2.1

```
1) Set SCA: (nul)
E) Exit
```

The SCA is the service center address, used by the TCS to send SMS messages. Program it with the service center given to you by your operator. Default is nul, that means that the TCS will not be able to SEND SMS messages, though it will receive them.

2.2

```
GSM destination numbers:
1) Set GSM1: (nul)
2) Set GSM2: (nul)
3) Set GSM3: (nul)
4) Set GSM4: (nul)
5) Set GSM5: (nul)
6) Set GSM6: (nul)
7) Set GSM7: (nul)
8) Set GSM8: (nul)
E) Exit
```

Destination numbers are the GSM phones to which the TCS will send the various alarms.
You can decide what alarm(s) go(es) to what phone(s) by means of the Input-GSM MATRIX that is available in the Input Menu.

2.3

```
SMS Messages (39 char max)
1) Set SMS1: (Input 1 Message)
2) Set SMS2: (Input 2 Message)
E) Exit
```

With this menu you can program the text(s) that will be sent when alarm on input 1 or 2 will occur.

2.4

```
SMS counters
1) SMS IN  = 0
2) SMS OUT = 0
3) SMS OUT MAX per day = 40
4) SMS OUT SENT (25/7) = 0
E) Exit
```

This menu lets you see (and change) the SMS counters and **IMPORTANT** to set the maximum number of SMS that can be sent each day.
This is a typical source of problems. Usually customers exceed this number and TCS stops sending SMS, and we get a request becasue the TCS is not working....

2.5

```
1) SMS SN: (0000)
E) Exit
```

This menu lets you decide the initial serial number of the SMS that will appear at the beginning of any messge.
Since operators sometimes send SMS twice, this feature is implemented exactly to notice if the SMSs are originated more times by the TCS (=different serial numers) or if they are sent multiple times by the operator (=same serial number).

2.6

```
1) TCL ID: (0000000000)
E) Exit
```

This menu lets you program the ID that is associated with each TCS and that comes at the beginning of any SMS. Very useful if you have more units.

3-Set INPUT

```
1) Set Input mode
2) IN[1..8] to GSM[1..8] matrix
3) Input Counters
4) Input Subcounters values
5) Comparators values
6) IN[1..2] Delay Time
E) Exit
```

Use the following submenus to modify inputs parameter etc.

3.1

```
Set Input mode:
0=Active Low
1=Active High
2=Counter
1) IN1 = 0 (0,1,2)
2) IN2 = 0 (0,1,2)
E) Exit
```

Inputs can be active low, active high or counters.
If they are counters they are always counting low going pulses.
By ACTIVE LOW we mean the input after the optocoupler, so if you apply tension to the diode and light it up, you are infact applying a low signal to the input.

Again, if you connect it using the power provided by the board and pulling down the -inputs then you are applying a low pulse. Active Low is the standard setting.

If you want to use the inputs as counters, set input mode to 2.

Alarm(s) will be generated when input counts are equal to comparator values.

3.2

```
IN[1..2] Generic Input
IN[3]    Power down
IN[4]    not used
IN[5]    not used
IN[6]    not used
IN[7]    not used
IN[8]    not used
1)      In1     = 1,0,0,0,0,0,0,0
2)      In2     = 1,0,0,0,0,0,0,0
3)      In3     = 1,0,0,0,0,0,0,0
4)      In4     = 1,0,0,0,0,0,0,0
5)      In5     = 1,0,0,0,0,0,0,0
6)      In6     = 1,0,0,0,0,0,0,0
7)      In7     = 1,0,0,0,0,0,0,0
8)      In8     = 1,0,0,0,0,0,0,0
E) Exit
```

Use this submenu to change what phone(s) receive(s) what alarm(s).
In the TCS-LC the input-GSM matrix can be set also via SMS command.

3.3

```
Input Counters[1..2]
1) IN[1] = 0
2) IN[2] = 0
E) Exit
>E
```

Use this submenu to see and change total counters values

3.4

```
Input Subcounters values [1..2]
1) IN[1] = 0
2) IN[2] = 0
E) Exit
```

Use this submenu to see and change partial counters values,that are reset (and an alarm is generated) everytime their value equals comparator.

3.5

```
Comparators values [1..2]
1) IN[1] = 1
2) IN[2] = 1
E) Exit
```

Use this submenu to see and change COMPARATORS VALUES. When Subcounter value reach comparator value an alarm is generated and subcounters are reset.

3.6

```
IN[1..2] Delay Time
Value 2 to 32000 sec.
1) IN1 = 5 sec.
2) IN2 = 5 sec.
E) Exit
```

Use this submenu to see and change input activation delay time, that is how long the input should be active before an alarm is generated.

4) LCD Display Message

```
LCDS Messages (39 char max)
1) Set LCD Msg1: (message 1)
2) Set LCD Msg2: (message 2)
E) Exit
```

Use Submenu 1 to change LCD message that appears on Startup.
LCD Message 2 is not used in current versions.

6-Power Alarm

```
1) Power Fail Alarms = Disabled
2) Power Fail Countdown (sec) = 60
E) Exit
```

TCS LC can have as an option a 6V AA battery pack to enable the delivery of power down alarm messages before shutting down.
Since TCS-LC cannot run for a long time on AA batteries we recommend not to put a Power fail countdown value over 600 seconds. Standard value is 60 seconds, that means that after 1 minute without power, TCS-LC will send alarm(s) to the GSM phone(s) indicated in the matrix and then it will shut down.
Since this function is performed using Relay 1, it is possible to DISABLE the power alarm function in case it is preferrable to use the output instead.

7-SECURITY

```
Setup administrator & user password
1) Administrator Password
2) SIM PIN
3) Access MODE
9) Silent MODE = Disabled
E) Exit
```

Use this menu to change Password and input PIN code.
Password must be 6 numbers.
If you program a SIM PIN make sure your PIN have the PIN you have programmed otherwise after 3 power-ups you will need to put the SIM in a phone and use the PUK code to unlock it.

For most applications we recommend that you put the SIM into your phone, you disable the PIN request and then put it in teh TCS. In this way you don't need to program any PIN number.

7.3

```
Access MODE = 0
1) FREE ACCESS
2) WHITE LIST
9) Define white list
E) Exit
```

Use the access mode menu to decide how you want the gate function to be operated.
The gate function, when enabled, clicks for 0,5 seconds Relay 2 if the number of the phone calling the Voice Number of the SIM (The standard Number) is in the white list.
If you choose Access mode=Free access, anybody will activate the relay, regardless of his/her number being or not in the list.
If you choose white list, only the phones in the list will activate the relay.
Since the call will be rejected, nobody will pay anything (now. In the future who knows what type of billing operators will invent...)

To define The White List you simply have to input up to 10 righmost digits of the numbers that you want to enable.
Since operators differ in how and if they send the country code, we recommend that you only put the phone number. I.E. If you put 5 digits, they will be compareed with the rightmost 5 digits of the calling phone.
You can use wildchar (?) to accept any digit.
I.E. an entry like 34825883?? will accept any phone that has 34825883 and then 01 to 99 in the last 2 digits.
I.E. an entry like 78812345 for a country like Italy (39 as country code) will accept the number if the operator sends 3978812345 or if it only sends 78812345.

8)Voice call options

```
8-Voice call option = 0
0) no action
1) GATE
E) Exit
```

Use this menu to enable (1) or disable (0) the Gate function.

This is

TCS-LC instructions manual V.1.0
addendum to TCS 3.0 Instructions manual

Last modification : 15-7-2002

Created by :

Telecom Control Systems division
DPS-Promatic srl
47100 Forli Italy

E-mail tcsinfo@dps-promatic.com

Look for updates on line at http://www.dpspro.com