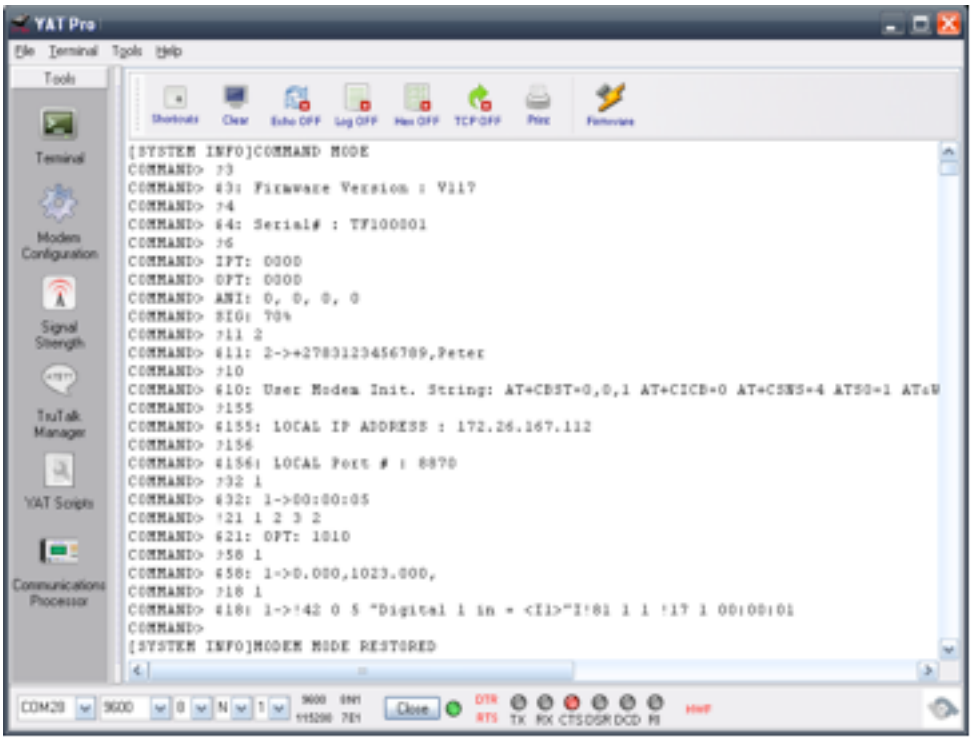
Maestro Industrial 10



TruTalk Language

Telecommunications Products

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1 INTRODUCTION

1.1 Background

The Maestro Industrial 10 telemetry terminal is controlled by a set of commands and parameters called TruTalk

Note: The commands in this document are related to firmware V3_55. If your current firmware does not support a specific command that you want to use, then please contact Maestro Wireless Solutions for an upgrade option.

The latest version of this document is available for downloading after login from the following link:
http://www.maestro-wireless.com

2 COMMAND MODE

By default the Maestro Industrial 10 main serial port acts as a standard modem. However this serial port is also used to enter commands and to configure the unit. The AT command AT$TT is used to enter the TruTalk text mode command prompt. In this mode the unit will echo all incoming text, and add command prompts and readable carriage returns as well as line feeds. The command mode will time-out after a default 30 seconds, or can be quitted by typing <ctrl-z>, this will return the Maestro Industrial 10 into normal modem mode.

A simplified command mode is also available for use with serial applications by entering AT$RT (RawText). In this mode there will be no echoing or prompts to simplify the serial encapsulation in a typical application.

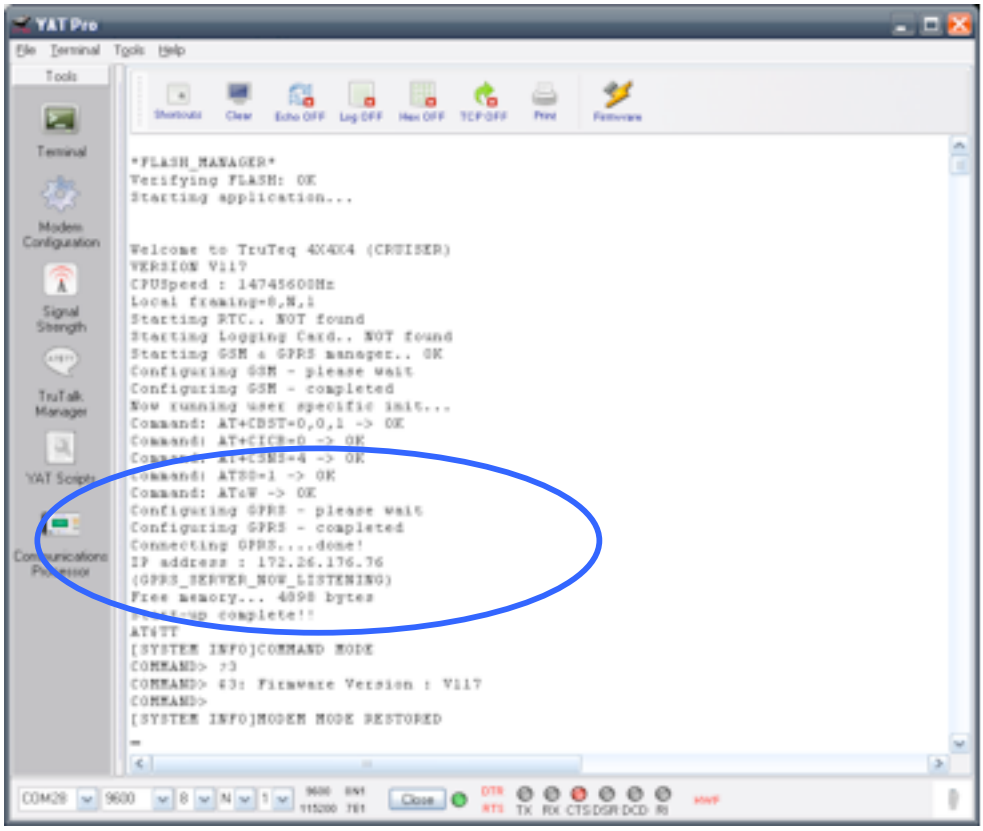
2.1 Entering Commands

Commands can be entered via the serial port, sms, GPRS or even data call.

2.1.1 Serial Port

Commands can be entered via the serial port, once the unit has started up and printed “Start-up complete!!” on the serial port. **COMMAND MODE** is entered by typing-in **AT$TT** <enter>

Default serial parameters are: 9600,8,N,1.



2.1.2 SMS

Commands can be send via sms.
Simply sms the command to the unit. Multiple commands can be send in 1 sms.

Note: make sure you are an allowed user before sending an sms to the unit see commands 11 and 95

2.1.3 Data call / GPRS mode

Connect to the unit either via data call or TCP connection via GPRS.
Once the connection is made then command mode can be entered by sending 3 sequential minuses (---). The remote unit will now be in command mode and ready to receive commands over the air.

2.2 Managing the firmware version (on-board software)

The Maestro Industrial 10 includes an application called FLASH MANAGER (FM). This application resides in the protected boot loader space of the microprocessor. At start-up it verifies the FLASH memory content and from there starts the application.

The firmware version is printed out on the second line after start-up. It can also be checked with command ?3 on the TruTalk command line.

New firmware is loaded onto the unit using Flash Manager. The Flash Manager can be set into boot load mode by either sending it <space> characters at start-up (thus holding in the <space bar> while switching the unit on), or by using command !9 on the TruTalk command line.

3 COMMANDS & COMMAND LISTS

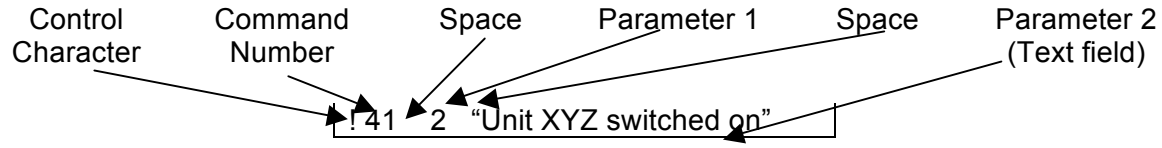
3.1 Commands – the building blocks of Command Lists

A Command starts with a Control Character (an exclamation mark <**!**> for a command, or a question mark <**?**> for a request), followed by a Command Number. This number indicates the action to be performed and are followed by different Parameters, which are always separated by at least one space.
Responses by the Maestro Industrial 10 unit are always returned to the Originator (person/machine who sent the request/command) in the same sequence as the request/command was made.

Any number of spaces can be used between separate Commands – the extra spaces are interpreted as white space and may be used to enhance readability. Just keep in mind that these spaces are also included in the maximum of 100 characters allowed in a Command List.

Double quotes <**“ ”**> indicates a text field and any control characters (**!**/**?**) or numbers contained between these double quotes, are handled as text only.

Example: (send SMS – <**!41**>)

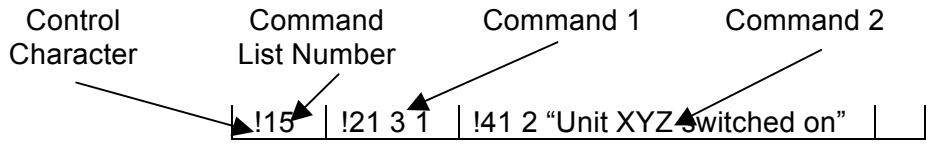


Note: Multiple commands can be entered at a time, in both the command mode and in an sms.

3.2 Command Lists

A Command List consists of a Control Character (an exclamation mark <**!**> for a command, or a question mark <**?**> for a request) and a Command List Number. This is followed by several Commands (minimum = 1, maximum = limitless). The total length of each Command List may not exceed 100 characters. The Command List Number is the association between an event and the following Commands.

Example: (start-up event – <**!15**>)



Note: Only one command list can be entered at a time, in both the command mode and in an sms.

3.3 Command Input / output Options

The state of a specific digital input or digital output can be specified (in Commands and Command Lists) with the following:

1. <**0**> - Switch off / disable / deactivate
2. <**1**> - Switch on / enable / activate

3.4 Command text Options

Text is entered between quotation marks “<text>”, the content will be handled as one parameter. One can however add variables into the text area with the use of escape codes. Escape codes are placed between triangular brackets <escape code>. The following escape codes are available:

<C1-4>	Print counter 1 to 4
<S1>	Print serial input buffer 1
<T1-5>	Print timer 1 to 5 remaining time
<O1-20>	Print digital output 1 to 20 status (1=on 0=off)
<I0-20>	Print digital input 0 to 20 status (1=on 0=off) (0 = Mains Available on supported units)
<A1-8>	Print analogue input 1 to 8
<AO>	Print analogue output
<RS>	Received signal strength indication (0-100, or “—“ if unknown)
<DQ>	Insert double quote (“)
<RT>	Insert time from RTC
<RD>	Insert date from RTC
<CR>	Insert Carriage Return
<LF>	Insert Line Feed
<xHH>	Insert Byte – format is 0x HEX
<SN>	Insert Serial Number
<ST>	Insert Status string
<IP>	Print own IP address
<P1-8>	Insert Pulse Counter 1 to 8's value

Multiple escape codes can be within 2 brackets:
“<A1><A2><A3>” can also be written as “<A1A2A3>”

Example of sending a sms with the values of counter 1 and timer 2.

```
!41 1 “The value of counter1=<C1> and the value of timer2=<T2>”
```

If counter 1 was 25 and timer 2 was 14min and 23sec then this sms will display the following:

```
The value of counter1=25 and
the value of timer2=00:14:23
```

4 COMMAND SUMMARY

No	Command String	Request String	Description
3		?3	Software Version
4		?4	Serial number
5		?5	Manufacturing details
6		?6	Quick view (will return all inputs, outputs and signal strength)
7	!7 <interval>	?7	Signal logging interval
8		?8	Query signal log values
9	!9 SERIAL		Set modem to receive new firmware
10	!10	?10	Modem Initialization String
11	!11 <N> <NoString>,<NameString>	?11 <N>	Write to phone book Note: NameString optional
15	!15 <String>	?15	Start-up Commands
16	!16 <N> <Option>	?16 <N>	Control timer
17	!17 <N> <Option>	?17 <N>	Configure timer
18	!18 <N> <String>	?18 <N>	Timer time-out Command lists
21	!21 <N> <Option>	?21	Output state N+100 = internal GPIOs
32	!32 <N> <Option>	?32 <N>	Input Debounce
34	!34 <N> <String>	?34	Input trigger Commands (low to high)
35	!35 <N> <String>	?35	Input trigger Commands (high to low)
41	!41 <N> <String>		SMS Message sending
42	!42 <N> <time> “Event String”		Send event over GPRS fallback by sending SMS to phonebook position N
45	!45 <N> <String>	?45	Define customised list of Commands
46	!46 <N>		Execute custom command list number <N>
47	!47 <Dest> “String”		Send String to <Dest> 2 = Serial Port (1A – master ext) 3 = Serial Port (1B – slave int) 4 = I2C @ add 10010010
48	!48 <Dest> <Hex-Array>		Send array of HEX chars to <Dest>
50		?50	Display Analog input values
51	!51 <N> <Option>	?51 <N>	Analog Input Debounce
52	!52 <N> <highRecover> <highTrip>	?52 <N>	Analogue input configuration (High Trip Points)

53	!53 <N> <lowTrip> <lowRecover>	?53 <N>	Analogue input configuration (Low Trip Points)
54	!54 <N> <String>	?54 <N>	Analogue input High Trip Command list
55	!55 <N> <String>	?55 <N>	Analogue input High Recover Command list
56	!56 <N> <String>	?56 <N>	Analogue input Low Recover Command list
57	!57 <N> <String>	?57 <N>	Analogue input Low Trip Command list
58	!58 <N> <lowLimit> <highLimit> <unit>	?58 <N>	Setup analog input scaling and units
60	!60 <Option>	?60 <N>	Set prefered SIM card slot
63	!63 <String>		Set PIN code
64	!64 <String> <optional var>		Submit AT commands
66	!66 <Option>	?66	GSM Reset setup
67	!67 <Option>	?67	Allowed Data Call time
68	!68 <String>	?68	HouseKeeping interval
73	!73 <Option>	?73	Day-Time setting on clock
74	!74 <Option>	?74	Date setting on clock
75	!75 <1or2> <Option>	?75 <1or2>	en/disable Day-Time event
76	!76 <1or2> <Option>	?76 <1or2>	Day-Time event time-setting
77	!77 <1or2> <String>	?77 <1or2>	Day-Time event script
80	!80 <N> <Option>	?81 <N>	Counter Value Load
81	!81 <N> <Option>		Increment counter value
82	!82 <N> <Option>		Decrement counter value
83	!83 <N> <ValueLow> <ValueHigh>	?83 <N>	Counter Compare Values
84	!84 <N> <String>	?84 <N>	Counter <= Compare Low Command lists
85	!85 <N> <String>	?85 <N>	Counter >= Compare High Command lists
90	!90 <PB pos> <String>	?90 <PB pos>	Incoming calls (Voice) Commands
91	!91 <PB pos> <String>	?91 <PB pos>	Incoming calls (Data) Commands
92	!92 <0/1>		Answer(1) or reject(0) incoming call
95	!95 <N><Option>	?95 <N>	Control allowed users
97	!97 ALL	?97	Query number of logs or erase all logs
98	!98 <String>	?98 <N>	Write log record, or read <N> number of logs
150	!150 (1/0)	?150	GPRS Active/Inactive
151	!151 (1/0)	?151	GPRS Attached/Detached
152	!152 (1/0)	?152	GPRS Client/Server

153	!153 IP address	?153	IP address 1 (server mask)
154	!154 IP address	?154	IP address 2 (client connect)
155		?155	IP address 3 (own IP)
156	!156 <V>	?156	Server Listen Port no
157	!157 <V>	?157	Client Connection Port no
158	!158 APN add	?158	Access Point Name Server
159	!159 UserName	?159	APN username
160	!160 PassWord	?160	APN password
161	!161 <A> <B> <C>	?161	GPRS manager setup
164	!164 “IP address”		ping “IP address”
165	!165 <N> “optional-IP add”	?165	keep-alive ping
170	!170 (0 or time-out)	?170	Serial input Manager Active/Inactive
171	!171 <String>	?171	Execute <String> when serial input event occurs
251		?251	Get System uptime
252	!252 <digIn> <digOut> <AnIn>	?252	IO setup
254	!254 (1/0)	?254	RS485 enable / disable
256	!256		Reset Unit
257	!257 <BaudRate> <IO_Framing>	?257	Set communications parameters
258	!258 <seconds>	?258	Set command mode timeout
260	!260 (0->4)	?260	Debugging to Serial port 0- No Debug 1- GSM Debug 2- System Debug 3- Allowed users Debug 4- Command handler Debug
261	!261 (0/1)	?261	Return SMS on Commands 0 – no return sms 1 – return sms (default)
262	!262 (0/1)	?262	Auto Remote Command Mode 0 – disable (default) 1 – enable
263	!263 (0/1/2)	?263	Communications Port 1 – No link to GSM 2 – Only link data 3 – Always linked
264	!264 (0/1)	?264	Modbus enable / disable

265	!265 (0/1)	?265	Mains input enable / disable
266	!266 (0/1)	?266	Dial-up option
267	!266 <N>	?266	Data flush delay

5 COMMANDS IN DETIAL

5.1 Query Firmware version_____ 3

This request is used to get the current firmware version installed on the device.

Write format:

?3

Example:

Operator to Unit	?3	Request firmware version
Unit to Operator	$3: Firmware Version : Vx.xxx	

5.2 Query Unit Serial Number _____ 4

This request is used to get the device's serial number.

Write format:

?4

Example:

Operator to Unit	?4	Request serial number
Unit to Operator	$4: Serial# : TFxxxxxx	

5.3 Query Unit Manufacturing Details_____ 5

This request is used to get the device's manufacturing details.

Write format:

?5

Example:

Operator to Unit	?5	Request manufacturing details
Unit to Operator	$5: Manuf. details : xxxxxxxx	

5.4 Quick view _____ 6

This request is used to obtain the status of ALL the outputs and inputs, as well as the GSM signal strength (as a percentage). The status will be supplied in the following format:

Example:

IPT: ABCD (Digital input status)
OPT: MN (Digital output status)
ANI: a, b (Analogue input status)
SIG: XX% (Signal strength)

Where:

A is the status of **Input 1** (1 = on, 0 = off)
B is the status of **Input 2** (1 = on, 0 = off)
C is the status of **Input 3** (1 = on, 0 = off)
D is the status of **Input 4** (1 = on, 0 = off)

M is the status of **Output 1** (1 = on, 0 = off)
N is the status of **Output 2** (1 = on, 0 = off)

a is the status of **Analogue Input 1**
b is the status of **Analogue Input 2**

Write format:

?6

Example:

Operator to Unit	?6	Request status
Unit to Operator	OPT: 0001 IPT: 1001 SIG: 85%	Return status (if only one Maestro Industrial 10 digital input/output card is fitted)

5.5 Signal Analyser configuration 7

This command is used to set the recording interval for the received signal analyser tool. Setting it to 0 switches this functionality off.

Write format:

!7 <interval>

?7

Example:

Operator to Unit	!7 30	Set the unit to log the received signal every 30minutes.
Unit to Operator	$7: signal log interval 30 minutes	
Operator to Unit	?7	Request current log interval
Unit to Operator	$7: signal log interval 30 minutes	

5.6 Display Signal Analyser log 8

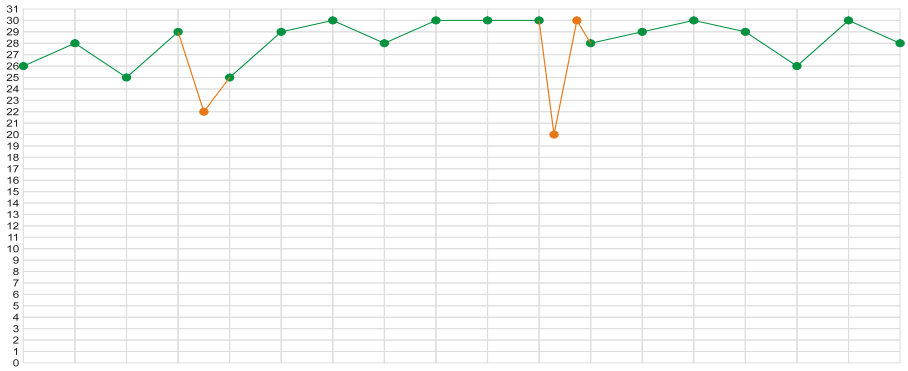
This command is used to display the data logged by the signal analyser. A 'c' character before a value means that there was a big change in the received signal quality, that did not fall on the record interval. The received values are between 0 (no signal) and 31 (full signal). The unit must have a SIM card that is registered on the network for the logger to log.

Write format:

?8

Example:

Operator to Unit	?8	Query the signal log
Unit to Operator	$8: 26 28 25 29 c22 25 29 30 28 30 30 30 c20 c30 28 29 30 29 26 30 28	



5.7 Firmware Upgrade 9

This Command is used to upload new firmware onto the product using the on-board Flash Manager. This command sets the 'new firmware upload flag' in the Flash Manager and then restarts the unit. Use MaestroYATPro's firmware function to upload the new firmware.

Write format:

!9 SERIAL

!9 OTA IP_address:Port# <APN_name> [username] [password]

5.8 Modem Specific Initialisation 10

This Command is used to store a list of AT commands to be performed when the device is powered-up. The user can use this to enable/disable modem specific type of commands eg: set hardware flow control to none with AT+IFC=0,0 and set auto answer on with ATS0=1.

Write format:

!10 <STRING> (AT commands must be space delimited)

?10

Example:

Operator to Unit	!10 AT+IFC=0,0 ATS0=1	Set modem H/W flow control to none and auto answer incoming calls after 1 ring.
Unit to Operator	$10: User Modem Init. String: AT+IFC=0,0 ATS0=1	
Operator to Unit	?10	Request current user specific init string
Unit to Operator	$10: User Modem Init. String: AT+IFC=0,0 ATS0=1	

Note: The unit will re-start to implement the change

Tip: init string to set modem for AMR:
!10 AT+CBST=0,0,1 AT+CICB=0 AT+CSNS=4 ATS0=1

5.9 Write to phone book Command _____ 11

This Command is used to store user's cell phone numbers in the SIM Phone Book. The maximum number of cell phone numbers that can be stored, will be determined by the SIM card in use (typically 200). These numbers can be overwritten with new numbers (if required).

It is important to have the users names and numbers in the phone book, as it used for sending and receiving sms. Please also see the allowed user command number 95.

Note: These numbers are stored on the SIM card and not on the unit, so these numbers will have to be re-entered if the SIM card is swapped out or replaced.

Write format option1:

☞ Only the user's number is stored in this format.

!11 <Phone book position> <Cell phone number> < Phone book position> <Cell phone number>…..

?11 <Phone book position> <Phone book position> <Phone book position>…..

Example:

Operator to Unit	!11 15 +27835638592 117 +27836479220	Write phone number 0835638592 in position 15 and phone number 0836479220 in position 117 in the SIM phone book
Unit to Operator	$11 15->+27835638592 117->+27836479220	
Operator to Unit	?11 15 117	Request current phone numbers in positions 15 and 177 in the SIM phone book
Unit to Operator	$11 15->+27835638592 117->+27836479220	

Write format option2 (recommended):

☞ The user's number and name is stored in this format.

!11 <Phone book position> <Cell phone number>,<person's name> < Phone book position> <Cell phone number>,<person's name>…..

?11 <Phone book position> <Phone book position> <Phone book position>…..

Example:

Operator to Unit	!11 15 +27835638592,Peter 117 +27836479220,Jhon	Write phone number 0835638592 in position 15 and phone number 0836479220 in position 117 in the SIM phone book
Unit to Operator	$11 15->+27835638592,Peter 117->+27836479220,John	
Operator to Unit	?11 15 117	Request current phone numbers in positions 15 and 177 in the SIM phone book
Unit to Operator	$11 15->+27835638592,Peter 117->+27836479220,John	

5.10 Start-up Command List _____ 15

The device can be programmed to perform certain Commands when a start-up (power-up) condition occurs, for example switching certain outputs on or off, sending an SMS message to a specific number in the SIM phone book, etc.

Write format:

!15 <Command1> <Command2> <Command3>

?15

Example:

Operator to Unit	!15 !21 3 1 !21 4 0 !41 2 “Unit XYZ switched on”	Start-up Command List Number, Switch output 3 on, Switch output 4 off, Send an SMS message to phone book position 2 that reads: "Unit XYZ switched on”
Unit to Operator	$15 !21 3 1 !21 4 0 !41 2 “Unit XYZ switched on”	
Operator to Unit	?15	Request current Start-up Command List configuration
Unit to Operator	$15 !21 3 1 !21 4 0 !41 2 “Unit XYZ switched on”	

Note: The unit will re-start to implement the change

5.11 Control timers Command_____ 16

There are 5 separate timers in the Maestro Industrial 10 and this Command can be used to start or stop any of the timers. When a specific timer runs out, a Command associated with the event could be to start the timer again, thereby creating a recurring timed event.

Tip: Remember to first load a time into the timer with command 17 before starting the count down timer.

Option Parameters:
0 = stop timer
1 = start count-down timer
2 = start count-up timer

Write format:

!16 <Timer number> <Option> <Timer number> <Option> <Timer number> <Option>…..

?16 <Timer number> <Timer number> <Timer number>…..

Example:

Operator to Unit	!16 4 0 1 1	Stop timer 4 and start timer 1
Unit to Operator	$16: 1->1 4->0	
Operator to Unit	?16 1 4	Request current status of timers 1 and 4
Unit to Operator	$16: 1->1 4->0	

Note: That when the count-up option is used there will be no event script associated with the timer. The event script is only executed when the timer reaches zero.

5.12 Configure timers Command _____ 17

This Command can configure the 5 timers' characteristics in hours, minutes and seconds to a maximum of 99 hours, 59 minutes and 59 seconds. If not configured, the default will be '0' (no timer).

Write format:

!17 <Timer number> <hh:mm:ss> <Timer number> <hh:mm:ss>…..

?17 <Timer number> <Timer number> <Timer number>…..

Example:

Operator to Unit	!17 1 00:10:30 5 06:00:00	Set timer 1 to 10 minutes and 30 seconds, set timer 5 to 6 hours
Unit to Operator	$17: 1->00:10:30 5->06:00:00	
Operator to Unit	?17 5 1	Request current configuration of timers 5 and 1
Unit to Operator	$17: 5->05:59:51 1->00:10:21	

Note: This Command doesn't physically switch any of the timers on, but just configures their characteristics. Use the Control timers Command <**!16**> to switch any/all of the timers on.

5.13 Timer time-out Command List _____ 18

The timers can be programmed to perform certain Commands when it runs out, for example it could switch certain outputs on or off, send an SMS message to a specific number in the SIM phone book, etc.

Write format:

!18 <Timer number> <Command1> <Command2> <Command3>

?18 <Timer number>

Example:

Operator to Unit	!18 4 !21 3 1 !21 4 0 !41 7 “Timer timed out” !17 4 24:00:00	Timer time-out Command List Number – in the event of a time-out of timer number 4 the following Commands will be performed: Switch output 3 on, Switch output 4 off, Send an SMS message to phone book position 7 that reads: "Timer timed out”, Re-start the timer again (recurring timed event)
Unit to Operator	$18 1->!21 3 1 !21 4 0 !41 7 “Timer timed out” !17 4 24:00:00	
Operator to Unit	?18 4	Request current Timer timed-out Command List configuration for Timer number 4
Unit to Operator	$18 1->!21 3 1 !21 4 0 !41 7 “Timer timed out” !17 4 24:00:00	

5.14 Output state Command _____ 21

This Command is used to switch the defined output on or off, or to toggle (if it is on then switch it off and if it is off then switch it on) the output.

Option Parameters:
0 = switch output off
1 = switch output on
2 = toggle output
3 = pulse the output

Write format:

!21 <Output number > <Option> <Output number > <Option>…..

Example:

Operator to Unit	!21 2 1 4 0 1 2	Switch output 2 on, switch output 4 off, toggle output 1
Unit to Operator	OTP: 1100	

Note: The status of the standard outputs are volatile, thus the outputs will always start in the off position when the unit is power-cycled. Use start-up command list to set an output to a desired state at start-up.

5.15 Input Debounce Command _____ 32

The Debounce period is the amount of time that lapses before a specific task is performed. This Command can configure the Debounce period of an input in hours, minutes and seconds to a maximum of 99 hours, 59 minutes and 59 seconds. If not configured, the input will (by default) have no Debounce period.

Note: Digital input # 0 refers to units with an internal battery that has a mains available option.

Write format:

!32 <Input number> < hh:mm:ss > <Input number> < hh:mm:ss >…..

?32 <Input number> <Input number> <Input number>…..

Example:

Operator to Unit	!32 1 00:00:25	Configure input 1 to have a 25 second debounce period before executing the associated Command List
Unit to Operator	No response	
Operator to Unit	?32 1	Request current Debounce period configuration of input 1
Unit to Operator	$32 00:00:25	

5.16 Input trigger (low to high) Command List _____ 34

The device can be programmed to perform certain Commands when an input is triggered/opened/switched on, for example switch certain outputs on or off, start the timer, send an SMS message to a specific number in the SIM phone book, etc.

Note: Digital input # 0 refers to units with an internal battery that has a mains available option.

Write format:

!34 <Input number> <Command1> <Command2> <Command3> <;>

?34 <Input number> <Input number>…..

Example:

Operator to Unit	!34 1 !21 3 1 !21 4 0 !41 2 “Door has been opened”;	Command List Number – in the event of a trigger on input 1 then the following Commands will be performed: Switch output 3 on, Switch output 4 off Send an SMS message to phone book position 2 that reads: "Door has been opened”
Unit to Operator	No response	
Operator to Unit	?34 1	Request current Input trigger (low to high) Command List configuration for input 1
Unit to Operator	1: !34 1 !21 3 1 !21 4 0 !41 2 “Door has been opened”;	

5.17 Input trigger (high to low) Command List _____ 35

In some applications one would want the device to perform certain Commands in the event when an input is switched off/closed/return to its original status or position.

Note: Digital input # 0 refers to units with an internal battery that has a mains available option.

Write format:

!35 <Input number> <Command1> <Command2> <Command3> <;>

?35 <Input number> <Input number>…..

Example:

Operator to Unit	!35 1 !21 3 0 !21 4 1 !41 2 “Door has been closed”;	Command List Number – in the ‘off’ event of input 1 then the following Commands will be performed: Switch output 3 off, Switch output 4 on, Send an SMS message to phone book position 2 that reads: "Door has been closed”
Unit to Operator	No response	
Operator to Unit	?35 1	Request current Input trigger (high to low) Command List configuration for input 1
Unit to Operator	1: !35 1 !21 3 0 !21 4 1 !41 2 “Door has been closed”;	

5.18 Send SMS message _____ 41

This Command is used to send SMS messages to any of the cell phone numbers in positions 1 to 200 of the SIM Phone Book. The same SMS message can be sent to multiple phone numbers in a single Command.

Write format:

!41 <Position number> <Position number> <Position number> <”> <Text message> <”>

Example:

Operator to Unit	!41 3 55 69 “Hello World” 1 “Hello World was sent”	Send “Hello World” to the cellphone numbers in positions 3, 55 and 69 and send “Hello World was sent” to the cellphone number in position 1 in the SIM Phone Book
Unit to Operator	$41: message send status.	

5.19 Send GPRS message _____ 42

This command creates a TCP Client connection to IP address 2 on port # 2 (see command 154 and 157). A SIM phone book position must also be supplied in case the GPRS connection was unsuccessful. The message will then be send via SMS. The connection open time-out must also be supplied (this field is in seconds).

Note: If the connection was made from command mode, and a time-out field was specified then the unit will quit command mode, however if the time-out field was set to zero, then the unit will stay in command mode after the message was send.

Write format:

!42 <Position number> <Connection Open Time-out> <”> <Text message> <”>

Example:

Operator to Unit	!42 3 1 “Input 1 sw on!”	Send “Input 1 sw on!” to the IP address 2 on port # 2.If unsuccessful then send “Input 1 sw on!” via sms to phone book position 3.
Unit to Operator	$42: message send status.	

5.20 Custom command list _____ 45

This Command is used to create custom command lists. There are 10 custom command lists.

Tip: Use custom command lists when deferent events must execute the same script, or when the 100 characters associated with an event is to little.

Write format:

!45 <List number> <Command List>

Example:

Operator to Unit	!45 5 !41 1 2 “Door status = <I4>”	When custom command list 5 is called then it will send a sms to phone book positions 1 & 2 giving the status of the door switch
Unit to Operator	$45: 5->!41 1 2 “Door status = <I4>”	

5.21 Execute Custom command list _____ 46

This Command is used to generate the event that will execute the associated custom command list.

Write format:

!46 <List number>

Example:

Operator to Unit	!46 5	Execute custom command list 5.
Unit to Operator	$46: Now running cmd list: 5	

Tip: Use command 261 to switch off return sms if the custom command list is going to send the required sms.

5.22 Send String command _____ 47

This Command is used to send a string to either the serial port (Dest=2) or the TWI LCD (Dest = 4).

Write format:

!47 <Destination> “String”

Example:

Operator to Unit	!47 4 “Input4=<I4>”	Write input 4 status to LCD
Unit to Operator	$47: text message send OK	

Note: See appendix A for the various LCD options that can be included in the string send to the LCD, ex ‘goto’ & ‘cls’.

5.23 Send HEX Array command _____ 48

This Command is used to send an array of HEX formatted characters including <NULL> to either the serial port (Dest=2) or the TWI LCD (Dest = 4).

Write format:

!48 <Destination> <HEX-ARRAY>

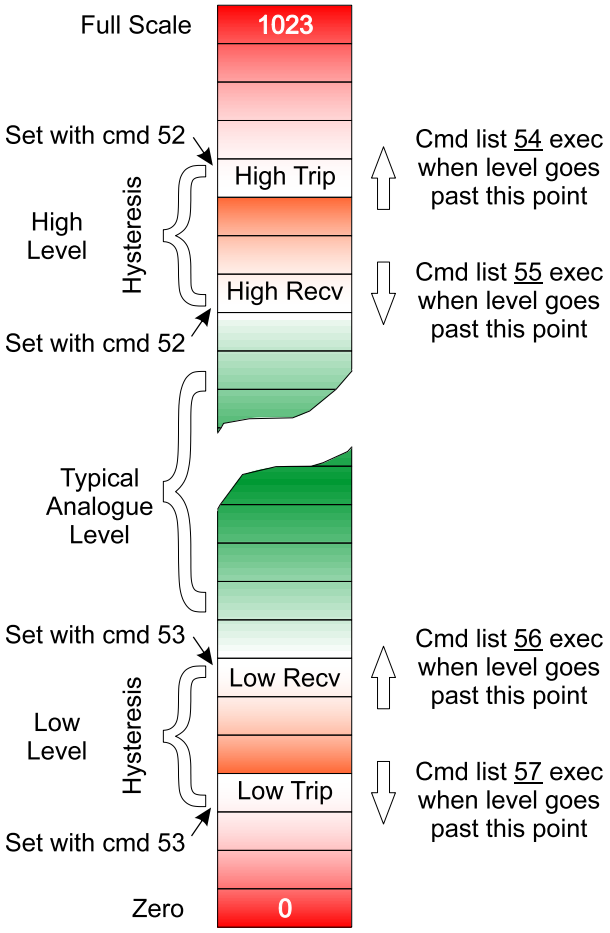
Example:

Operator to Unit	!48 2 00010305060AFF	Write <x00 x01 x03 x05 x06 x0A xFF> to serial port
Unit to Operator	$48: array send OK	

5.24 ANALOGUE Set-up _____ 50-58

Separate Command Lists are linked to the events where an analogue value passes a certain level. The following diagram explains which command lists are associated with which level.

Figure An1:



5.24.1 Read analogue status 50

This Command is used to read the analogue values.
The default value format will be an integer between 0 and 1023.

Note: If an analogue was scaled using command 58, then the scaled value will be displayed.

Read format:

?50

Example:

Operator to Unit	?50	Read analogues
Unit to Operator	$50: 0, 22.3degC, 0, 15.8Vdc	

5.24.2 Analogue debounce 51

This Command is used to set/get the analogue delay times.

Read format:

?51 <An#>

Write format:

!51 <An#> <debounceTime>

Example:

Operator to Unit	!51 1 00:00:01 2 24:00:00	Set analogue 1 debounce to 1 second and analogue 2 debounce to 24hours
Unit to Operator	$51: 1->00:00:01 2->24:00:00	
Operator to Unit	?51 1 2	Query # 1 and 2's debounce periods
Unit to Operator	$51: 1->00:00:01 2->24:00:00	

Analogue high trip levels 52

This Command is used to set/get the analogue high trip and recover levels.

Tip: See figure An1 for a better understanding to the use of this command.

Read format:

?52 <An#>

Write format:

!52 <An#> <High level recover value> <High level trip value>

Example:

Operator to Unit	!52 1 854 902	
Unit to Operator	$52: 1->852,902	
Operator to Unit	?52 1	
Unit to Operator	$52: 1->852,902	

5.24.3 Analogue low trip levels 53

This Command is used to set/get the analogue low trip and recover levels.

Tip: See figure An1 for a better understanding to the use of this command.

Read format:

?53 <An#>

Write format:

!53 <An#> <Low level trip value> <Low level recover value>

Example:

Operator to Unit	!53 1 301 357	
Unit to Operator	$53: 1->301,357	
Operator to Unit	?53 1	
Unit to Operator	$53: 1->301,357	

5.24.4 Analogue high trip command list 54

This Command is used to set/get the analogue high trip command list.

Tip: See figure An1 for a better understanding to the use of this command.

Read format:

?54 <An#>

Write format:

!54 <An#> <CMD list>

Example:

Operator to Unit	!54 1 !21 2 1	
Unit to Operator	$54: !21 2 1	
Operator to Unit	?54 1	
Unit to Operator	$54: !21 2 1	

5.24.5 Analogue high recover command list 55

This Command is used to set/get the analogue high recover command list.

Tip: See figure An1 for a better understanding to the use of this command.

Read format:

?55 <An#>

Write format:

!55 <An#> <CMD list>

Example:

Operator to Unit	!55 1 !21 2 0	
Unit to Operator	$55: !21 2 0	
Operator to Unit	?55 1	
Unit to Operator	$55: !21 2 0	

5.24.6 Analogue low recover command list 56

This Command is used to set/get the analogue low recover command list.

Tip: See figure An1 for a better understanding to the use of this command.

Read format:

?56 <An#>

Write format:

!56 <An#> <CMD list>

Example:

Operator to Unit	!56 1 !21 1 0	
Unit to Operator	$56: !21 1 0	
Operator to Unit	?56 1	
Unit to Operator	$56: !21 1 0	

5.24.7 Analogue low trip command list 57

This Command is used to set/get the analogue low trip command list.

Tip: See figure An1 for a better understanding to the use of this command.

Read format:

?57 <An#>

Write format:

!57 <An#> <CMD list>

Example:

Operator to Unit	!57 1 !21 1 1	
Unit to Operator	$57: !21 1 1	
Operator to Unit	?57 1	
Unit to Operator	$57: !21 1 1	

5.24.8 Analogue scaling 58

This Command is used to set/get the analogue scaling.

The output of the analogue sensor, being 4-20mA or 0-5V, almost always represents some sort of measurement. When queering the analogue value it's always handy to have it already scaled to the correct range and unit of the measured device.

When for example: measuring a temperature or voltage it's much better to have it already converted rather than to receive the raw 0-2048 (11bit) count and having to do the conversion yourself.

Note: Refer to the graph on analogue scaling (below) for more information regarding point descriptions

Read format:

?58 <An#>

Write format:

!58 <An#> <An_0_Value> <Sensor_High_Point> <unit>

Example:

Operator to Unit	!58 1 0 300 Vac	
Unit to Operator	$58: 1->0.00,300.00,Vac	
Operator to Unit	?58 1	
Unit to Operator	$58: 1->0.00,300.00,Vac	

Examples:

- If you measure mains voltage and your input range on the analogue converter is 0->300V input 0-5V output then use command 58 as follows:

```
!58 1 0 300 Vac
```

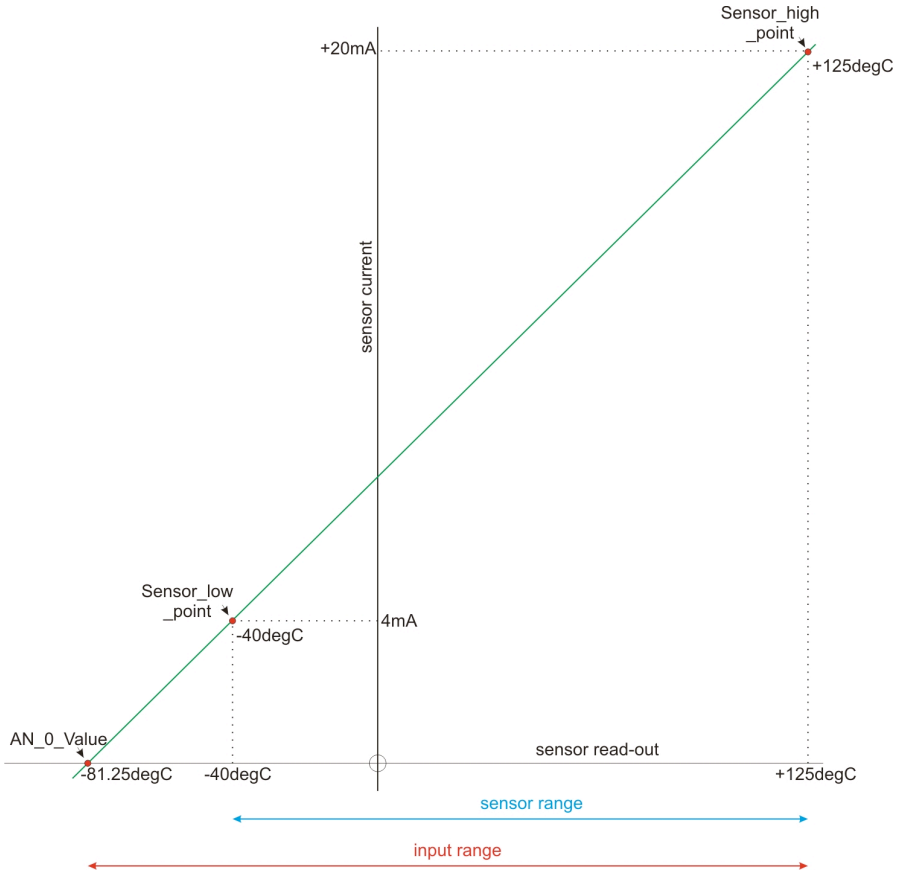
When you query analogue 1 it will return eg: 235.6Vac

- If you measure a value as a percentage

```
!58 1 0 100 %
```

When you query analogue 1 it will return eg: 65.35%

4-20mA sensor graph



- If you have a Maestro 4-20mA temperature sensor attached to the 0-20mA analogue input, then you need to set-up the scaling as follows:

```
!58 1 -81.25 +125 degC
```

Formula to calculate the AN_0_Value in a 4-20mA system is:
AN_0_Value = Sensor_Low_Point + ((sensor range)/16)*(-4))

Note: Any value returned lower than Sensor_Low_Value means that there is something wrong with the sensor.

- If you want to use the analogue as an un-scaled raw value then use command 58 as follows:

```
!58 1 0 2048
```

Note: leave the unit field empty
When you query analogue 1 it will return eg: 768

5.25 SIM slot management _____ 60

This Command is used to set/get the SIM card slot selection.

Read format:

?60

Write format:

!60 <Option>

Options:
1: Select SIM card slot 1
2: Select SIM card slot 2

Example:

Operator to Unit	?60	
Unit to Operator	$60: SIM1	
Operator to Unit	!60 2	
Unit to Operator	$60: SIM2	

5.26 SIM PIN management _____ 63

This Command is used to set/get the PIN number of the SIM card.

Read format:

?63

Write format:

!63 <PIN_NUMBER>

Example:

Operator to Unit	?63	
Unit to Operator	$63: PIN=12345 (PIN enter failed!)	
Operator to Unit	!63 5670	
Unit to Operator	$63: PIN=5670 (NEW PIN!)	
Operator to Unit	?63	
Unit to Operator	$63: PIN=5670 (PIN OK)	

5.27 Submit AT command _____ 64

This Command is used to submit an AT command to the modem, via the command mode prompt. An optional parameter of 1 can be given to wait for an unsolicited response before returning the result.

Write format:

!64 “<AT-command>” <optional N>

Example:

Operator to Unit	!64 AT	Query modem
Unit to Operator	$64: OK	
Operator to Unit	!64 “ATD*100#” 1	query the account balance
Unit to Operator	$64: OK You balance is R12,56 OK	
Operator to Unit	!64 “AT+CCED=0,1”	Query the connected base station information
Unit to Operator	$64: +CCED: 655,10,278c,3811,40,85,63,,,0,,,0 OK	

5.28 GSM reset interval _____ 66

This Command is used to set/get the GSM reset interval in minutes.

Read format:

?66

Write format:

!66 <Interval>

Example:

Operator to Unit	?66	
Unit to Operator	$66: GSM reset interval : 1440	
Operator to Unit	!66 2880	
Unit to Operator	$66: GSM reset interval : 2880	

Note: It is recommended to keep the interval on 1440 (default value)

5.29 GSM data call reset interval _____ 67

This Command is used to set/get the GSM data call reset interval in minutes.

Read format:

?67

Write format:

!67 <Interval>

Example:

Operator to Unit	?67	
Unit to Operator	$67: Data-call reset interval : 10	
Operator to Unit	!67 30	
Unit to Operator	$67: Data-call reset interval : 30	

Note: It is recommended to set the interval to 0 (zero) if GPRS connections is used

5.30 GSM house keeping interval _____ 68

This Command is used to set/get the GSM house keeping interval.

Read format:

?68

Write format:

!68 <Interval>

Example:

Operator to Unit	?68	
Unit to Operator	$68: HK interval : 1	

Note: It is recommended to keep the interval on 1 (default value)

5.31 RTC: Time-of-Day _____ 73

The RTC (Real Time Clock) is used to execute commands at a certain time of the day. There are 2 different time-of-day events that can be individually enabled and disabled.

This Command is used to set/get the time.

Note: A Real Time Clock must be installed if this function is to be used

Read format:

?73

Write format:

!73 <hh:mm:ss>

Example:

Operator to Unit	!73 15:04:00	Set the Time-of-Day to 4min past 3pm
Unit to Operator	$73: Time is 15:04:00	
Operator to Unit	?73	Query the Time-of-Day
Unit to Operator	$73: Time is 15:04:10	

5.32 RTC: Date _____ 74

This Command is used to set/get the Date.

Note: A Real Time Clock must be installed if this function is to be used

Read format:

?74

Write format:

!74 <DD/MM/YY>

Example:

Operator to Unit	!74 21/07/06	Set the Date to 21 July 2006
Unit to Operator	$74: Date is 21/07/06	
Operator to Unit	?74	Query the Date
Unit to Operator	$74: Date is 21/07/06	

5.33 RTC: En/Disable Time-of-Day event _____ 75

This Command is used to enable or disable the execution of a command script associated with a Time-of-Day event

Note: A Real Time Clock must be installed if this function is to be used

Read format:

?75 <event#>

Write format:

!75 <event#> <0/1>

Example:

Operator to Unit	!75 1 1 2 0	Enable event 1 and disable event 2
Unit to Operator	$75: 1->1 2->0	
Operator to Unit	?75 2	Query the status of event 2
Unit to Operator	$75: 2->0	

5.34 RTC: Time-of-Day event time setting _____ 76

This Command is used to set the time of the day that the event must happen.

Note: A Real Time Clock must be installed if this function is to be used

Read format:

?76 <event#>

Write format:

!76 <event#> <time-of-event>

Example:

Operator to Unit	!76 1 06:00:00 2 18:00:00	Set event 1 to 6am and event 2 to 6pm
Unit to Operator	$76 1->06:00:00 2->18:00:00	
Operator to Unit	?76 2	Query the time of event 2
Unit to Operator	$76: 2->18:00:00	

5.35 RTC: Time-of-Day event command list _____ 77

This Command is used to set the command list to be executed when the preset time-of-day is reached.

Note: A Real Time Clock must be installed if this function is to be used

Read format:

?77 <event#>

Write format:

!77 <event#> <command list>

Example:

Operator to Unit	!77 1 !21 1 0	Switch output 1 off at the time of event 1
Unit to Operator	$77 1->!21 1 0	
Operator to Unit	?77 2	Query the script associated with event 2
Unit to Operator	$77 2->!21 1 1	

5.36 COUNTERS _____ 80-85

There are 4 separate counters in the Maestro Industrial 10.
These commands can be used to load values, increment or decrement with values and assign command list to be executed when a counter reaches a certain value.
Note: Counters are signed 32bit integers thus the range is:
–2,147,483,648 to +2,147,483,648
The value of a counter can also be included in a message by using <Cx> inside the message eg: !41 1 “Counter values inside Maestro Industrial 10: 1=<C1> 2=<C2> 3=<C3> 4=<C4>”

5.36.1 Counter Value Load 80

This Command is used to load a value into a counter (this will overwrite the current value of the counter).

It is also used to obtain the current value of the counter.

Read format:
?80 <N>
Write format:
!80 <N> <value>

Example:

Operator to Unit	?80 1	Read counter 1 value
Unit to Operator	$80: 1->250	

5.36.2 Counter Increment 81

This Command is used to increment (increase the value of) any of the counters with a given value.

Write format:
!81 <N> <value>

Example:

Operator to Unit	!81 1 1	Increment counter 1 with 1
Unit to Operator	$80: 1->251	
Operator to Unit	!81 1 15	Increment counter 1 with 15
Unit to Operator	$80: 1->266	

5.36.3 Counter Decrement 82

This Command is used to decrement (decrease the value of) any of the counters with a given value.

Write format:
!82 <N> <value>

Example:

Operator to Unit	!82 1 1	Decrement counter 1 with 1
Unit to Operator	$80: 1->249	
Operator to Unit	!82 1 15	Decrement counter 1 with 15
Unit to Operator	$80: 1->234	

5.36.4 Counter low / high compare values 83

This Command is used to set/get the counter low & high compare values.

Read format:
?83 <N>

Write format:
!83 <N> <low compare value> <high compare value>

Example:

Operator to Unit	!83 1 10 20	
Unit to Operator	$83: 1->10,20	
Operator to Unit	?83 1	
Unit to Operator	$83: 1->10,20	

5.36.5 Counter low compare command list 84

This Command is used to set/get the counter low command list.
This command list will be executed when the counter value is smaller or equal to the low_compare_value set in !83

Read format:
?84 <N>

Write format:
!84 <N> <String>

Example:

Operator to Unit	!84 1 !21 1 1	
Unit to Operator	$84: 1 !21 1 1	
Operator to Unit	?84 1	
Unit to Operator	$84: 1 !21 1 1	

5.36.6 Counter high compare command list 85

This Command is used to set/get the counter high command list.
This command list will be executed when the counter value is higher or equal to the high_compare_value set in !83

Read format:
?85 <N>

Write format:
!85 <N> <String>

Example:

Operator to Unit	!85 1 !21 1 0	
Unit to Operator	$85: 1 !21 1 0	
Operator to Unit	?85 1	
Unit to Operator	$85: 1 !21 1 0	

5.37 Incoming Voice calls command list _____ 90

This Command can be used to program the Maestro Industrial 10 unit to execute certain commands when an incoming voice call is received from one of the first 10 numbers in the phone book.

Read format:
?90 <N>

Write format:
!90 <N> <String>

Example:

Operator to Unit	!90 3 !21 2 3 !92 0	Toggle output 2 and hang-up the incoming call
Unit to Operator	$90 3->!21 2 3 !92 0	
Operator to Unit	?90 3	Request the voice command list of user number 3
Unit to Operator	$90 3->!21 2 3 !92 0	

5.38 Incoming Data calls command list _____ 91

This Command can be used to program the Maestro Industrial 10 unit to execute certain commands when an incoming data call is received from one of the first 10 numbers in the phonebook.

Read format:
?91 <N>

Write format:
!91 <N> <String>

Example:

Operator to Unit	!91 5 !92 1	Answer the incoming call
Unit to Operator	$91 5->!92 1	
Operator to Unit	?90 5	Request the data command list of user number 5
Unit to Operator	$91 5->!92 1	

5.39 Incoming call control _____ 92

This Command can be used to program the Maestro Industrial 10 unit to answer (1) or reject (0) a call.

Write format:

!92 <Option>

Example:

Operator to Unit	!92 1	Answer the incoming call
Unit to Operator	$92: incoming call : Answered	

5.40 Control allowed users Command _____ 95

This Command can be used to program the Maestro Industrial 10 unit to allow only some or all of the cell phone numbers in the first 10 positions of the SIM Phone Book to send Commands / Command Lists to the Maestro Industrial 10 unit.

Write format:

!95 <Allowed user number> <Option> <Allowed user number> <Option>…..

?95 <Allowed user number> <Allowed user number> <Allowed user number> …..

Example:

Operator to Unit	!95 2 0 4 1	Disable allowed user number 2 and enable allowed user number 4
Unit to Operator	$95 2->0 4->1	
Operator to Unit	?95 2	Request the current status of allowed user number 2
Unit to Operator	$95 2-0	

5.41 LOGGING: Records manager _____ 97

This Command is used to query the number of log records in the MMC card or to delete some or all of the records.

Write format: (This will delete all the records in the log file)

!97 <Number to delete> <direction option>

<direction option> = 0 for FIFO
<direction option> = 1 for LIFO

Read format: (This will return the number of records in the log file)

?97

Example:

Operator to Unit	?97	Query the number of records in the log file
Unit to Operator	$97: log file size : 1565 records	

Operator to Unit	!97 565 0	Delete the oldest 565 records in the log file
Unit to Operator	$97: log file size : 1000 records	

Operator to Unit	!97 ALL	Delete all the records in the log file
Unit to Operator	$97: log file size : 0 records	

5.42 LOGGING: Write/read _____ 98

This Command is used add a log record, or to retrieve a number of the logged records.

Write format:

!98 <Log string>

Read format:

?98 <number of log records to read> <direction option>

<direction option> 0 = FIFO
<direction option> 1 = LIFO

Example:

Operator to Unit	!98 “Temp at <RT> was <A4CRLF>”	Write the string to the log file, containing the time as well as the value of analog input4
Unit to Operator	$98: number of logs: 1	
Operator to Unit	?98 10 0	Read the last 10 records
Unit to Operator	Maestro Industrial 10> $98: Reading last 10 record(s): Maestro Industrial 10> Temp at 13:03:46 was 24.8degC Temp at 13:05:08 was 24.6degC Temp at 13:05:46 was 24.9degC Temp at 13:07:54 was 24.8degC Temp at 13:09:24 was 25.1degC Temp at 13:13:23 was 24.9degC Temp at 13:18:25 was 25.1degC Temp at 13:23:27 was 25.3degC Temp at 13:28:30 was 25.3degC Temp at 13:33:32 was 25.3degC	

5.43 GPRS Set-up _____ 150-161

5.43.1 GPRS activate / deactivate 150

This Command can be used to activate or deactivate the GPRS server functionality inside the Maestro Industrial 10.

Note: set parameters in commands 153 –> 161 before setting GPRS manager to ACTIVE.

Tip: first set GRPS manager in-active before changing any GPRS parameters (!150 0)

Write format:

!150 0 or 1

?150

Example:

Operator to Unit	!150 1	Activate GPRS server (Note: first setup parameters 152-160 before activating GPRS)
Unit to Operator	$150: GPRS active	
Operator to Unit	?150	Request the current status of GPRS manager
Unit to Operator	$150: GPRS active	

5.43.2 GPRS IP address 1 153

This is the IP address from which a connection is allowed. Use 255.255.255.255 to allow all incoming connections.

Write format:

!153 172.24.16.2

?153

Example:

Operator to Unit	!153 255.255.255.255	Allow incoming connections from any server
Unit to Operator	$153: IP address 1: 255.255.255.255	
Operator to Unit	?153	Request the current IP address 1 field
Unit to Operator	$153: IP address 1: 255.255.255.255	

5.43.3 GPRS IP address 2 154

This is the IP address to whom a client connection is made.

Write format:

!154 172.24.16.2

?154

Example:

Operator to Unit	!154 172.24.16.2	Make client connection to 172.24.16.2
Unit to Operator	$154: IP address 2: 172.24.16.2	
Operator to Unit	?154	Request the current IP address 2 field
Unit to Operator	$154: IP address 2: 172.24.16.2	

5.43.4 GPRS IP address 3 155

This is the IP address of the Maestro Industrial 10, received from the network after a successful connection was established.
This will typ. be fixed IP add. on a private APN or variable IP add. on public APN

Write format:

?155

Example:

Operator to Unit	?155	Request the current IP address of the Maestro Industrial 10
Unit to Operator	$155: IP address 3: 172.24.16.7	

5.43.5 TCP Server Port number 156

This is the TCP Port where the Maestro Industrial 10 will be listing on.

Write format:
!156 502
?156

Example:

Operator to Unit	?156	Request the current TCP port number
Unit to Operator	$156: Port # : 502	
Operator to Unit	!156 7800	Set the port number to 7800
Unit to Operator	$156: Port # : 7800	

5.43.6 TCP Client Port number 157

This is the TCP Port where the Maestro Industrial 10 will be writing data to.

Write format:
!157 50030
?157

Example:

Operator to Unit	?157	Request the current TCP client port number
Unit to Operator	$157: Port # : 50030	
Operator to Unit	!157 7800	Set the port number to 7800
Unit to Operator	$157: Port # : 7800	

5.43.7 Access Point Name Server 158

Defines the APN server
Typ: “internet” for the Public APN
or “TRUTEQAPN” for the Maestroprivate APN

Write format:
!158 internet
?158

Example:

Operator to Unit	?158	Request the current APN setting
Unit to Operator	$158: APN: internet	
Operator to Unit	!158 TRUTEQAPN	Set the APN to truteq’s APN
Unit to Operator	$158: APN: TRUTEQAPN	

5.43.8 User name 159

Username required for connection to the APN

Write format:
!159 myUserName
?159

Example:

Operator to Unit	?159	Request the current username
Unit to Operator	$159: APN user name: myUserName	
Operator to Unit	!159	Clear the username field
Unit to Operator	$159: APN user name: invalid Data	

5.43.9 Password 160

Password required for connection to the APN

Write format:
!160 myPassWord
?160

Example:

Operator to Unit	?160	Request the current password
Unit to Operator	$160: APN user password: invalid Data	Empty password field
Operator to Unit	!160 myPassWord	Set password to myPassWord
Unit to Operator	$160: APN user password: myPassWord	

5.43.10 GPRS manager configuration 161

The Maestro Industrial 10 is equipped with a GPRS connection manager. The manager maintains an “always available” connection for telemetry devices where no user intervention is possible.

Write format:
!161 <GPRS attach refresh interval> <retry interval when error received> <No data flow timeout>
?161

Example:

Operator to Unit	?161	Request the current GPRS manager setup
Unit to Operator	$161: 240min 5min 75min	The Maestro Industrial 10 will detach and re-attach every 240min, in case of an error (typ GPRS network down) retries will happen every 5minutes. The Maestro Industrial 10 will detach and re-attach when a connection was made to the Maestro Industrial 10, but no data flowed within 75minutes.
Operator to Unit	!161 1440 30 30	This will set the GPRS manager to refresh attachment to the GPRS network on a daily basis, with 30min retry intervals on errors and a 30min data flow timeout.
Unit to Operator	$161: 1440min 30min 30min	

5.44 Ping 164-165

5.44.1 Ping IP address 164

This command is used to do a once-off ping request to the given IP address. The unit will attempt 3 pings with 8sec time-outs.

Write format:

!164 “IP address”

Example:

Operator to Unit	!164 “10.124.0.1”	ping 10.124.0.1
Unit to Operator	$164: : Packets: 1=expired 2=3542ms 3=1235ms	

5.44.2 Keep-alive ping setup 165

This command is used to setup the interval and IP address to ping in order to make sure the link is always available.

Write format:
!165 <N> “IP address”
?165

Example:

Operator to Unit	?165	Request the current ping keep alive
Unit to Operator	$165: keep-alive ping address="10.124.0.1" every 10min(s)	
Operator to Unit	!165 30	Set the interval to 30min
Unit to Operator	$165: keep-alive ping address="10.124.0.1" every 30min(s)	
Operator to Unit	!165 0	disable ping keep-alive
Unit to Operator	$165: keep-alive ping disabled	

5.45 Serial input event _____ 170-171

An instrument or measuring device with unsolicited serial output (for example a tag reader) can be connected to the Maestro Industrial 10. The unit can be configured to perform certain tasks when such an unsolicited serial event occurs.

Note: The serial input buffer size is 150Bytes big, thus the event originating data must not be more than 150characters.

Tip: Use the text escape code <S1> to access the buffered serial data

Tip: By entering 3 asterisks (***) followed by a pause, will take the unit out of the serial input event, to enable the user to access the serial port normally and to be able to deactivate the feature, or to set-up other parameters.

5.45.1 Set Serial input event active / inactive 170

This Command is used to enable / disable the Serial Input Event functionality.

Write format:
!170 <0 or (wait time X 100msec)>

Read format:
?170

Example:

Operator to Unit	?170	Query if Serial Input event feature is active
Unit to Operator	$170: Serial input event: Inactive	
Operator to Unit	!170 1	Set the Serial Input event to wait 100ms before executing associated script
Unit to Operator	$170: Serial input event: Active	

5.45.2 Command List for the Serial Input Event 171

This Command is used to set the command list associated with the serial input event.

Write format:
!171 <String>

Read format:
?171

Example:

Operator to Unit	!171 !21 1 3 !41 1 “Tag number is: <S1>”	Set the unit to pulse output 1 (i.e. a light) and then sms the input string to phone book position 1

5.46 System Hardware Set-up Parameters _____ 251-261

Note: The units will always be supplied from Maestrowith the correct hardware configuration loaded.

Note: These commands must be used with caution, as a wrong hardware configuration might result in the unit not responding anymore!!!

5.46.1 Get system uptime *251*

This Command is used to get the unit's uptime since it was switched on.

Read format:
?251

5.46.2 Set-up Hardware number of inputs and outputs and Analogues *252*

This Command is used to set the number of digital inputs, digital outputs and analog inputs connected to the device.

Write format:
!252 <Digital Inputs> <Digital Outputs> <Analog Inputs>

Read format:
?252

5.46.3 Set serial input to RS485 *254*

This Command is used to enable the RS485 (if fitted) option on the device

Write format:
!254 <0 or 1>

Read format:
?254

5.46.4 Force a hardware reset *256*

This Command is used to force a hardware reset.

Write format:
!256

5.46.5 Set-up serial port communications parameters 257

The GSM communications is fixed to 8,N,1 character framing.
The local port parameters can be set to any of the following baud rates: 2400, 4800, 9600, 19200, 38400, 57600, 115200 (where 57600&115200 will print a warning of high baud rate – possible data loss)
Data bit options are: 7 or 8
Parity bit options are: N, E or O (None, Even, Odd)
Stop bit options are: 1 or 2
Just update the terminal program to the newly set parameters and press <enter> after the settings have been changed.

Write format:
!257 <Baud-rate> <Number of data bits>,<Parity>,<Number of stop bits>
or
!257 <Baud-rate>

Read format:
?257

Example:

Operator to Unit	!257 9600 7,E,1	Set the unit to connect to a meter at 9600,7,E,1
Operator to Unit	!257 115200	Only set the baud-rate to 115200 (Don't change framing set-up)

5.46.6 Set command mode time out *258*

This Command is used to set the time out period for command mode to return to modem mode. This time out is in seconds.

Write format:
!258 <time-out>

5.46.7 Set debug on or off *260*

This Command is used to activate the debug data.
Available Options
0- No Debug

1- GSM Debug

2- System Debug

3- Allowed users Debug

4- Command handler Debug

Write format:
!260 <Option>

5.46.8 Enable return sms on commands received via sms *261*

This Command is used to activate return sms to sender

Write format:
!261 <0 or 1>

5.46.9 Enable auto remote command mode *262*

This Command is used to set device into auto remote command mode on incoming connections, either via CSD data call or GPRS connection. This is 'handy' when there's no device connected to the serial port, and only the TruTalk commands is used over the air.

Write format:
!262 <0 or 1>

5.46.10 Set communications Port *263*

This Command is used to set the link between the Maestro Industrial 10 serial port and the GSM link with the following options:

Write format:
!263 <0~2>

0 (internal): No link to the GSM (more suitable for telemetry applications)
1 (data): Only link during data connections (more suitable for AMR applications)
2 (all): Always linked to the GSM (more suitable for modem applications)

5.46.11 MODBUS *264*

The Maestro Industrial 10 supports modbus TCP protocol.
The following function codes are supported:

0x01 - Read Coil (get status of relay outputs)
0x02 - Read Discrete Inputs (get status of digital inputs)
0x03 – Read Holding registers

Address	Description
0x00	Signal strength (return 2 bytes)
0x01	Internal Counter 1 (return 2 bytes)
0x02	Internal Counter 2 (return 2 bytes)
0x03	Internal Counter 3 (return 2 bytes)
0x04	Internal Counter 4 (return 2 bytes)
0x05	Pulse Counter 1 MSB (return 2 bytes)
0x06	Pulse Counter 1 LSB (return 2 bytes)
0x07	Pulse Counter 2 MSB (return 2 bytes)
0x08	Pulse Counter 2 LSB (return 2 bytes)
|	| | | |
|	| | | |
0x13	Pulse Counter 8 LSB (return 2 bytes)
0x14	Pulse Counter 8 LSB (return 2 bytes)

0x04 – Read Input Registers (get values of analog inputs where applicable)
0x05 - Write Single Coil (set digital outputs)

Enter *** followed by a pause to re-enter command mode.

Write format:
!264 <0/1>

0 : Don't use MODBUS commands
1 : Use MODBUS commands to read the I/O

5.46.12

5.46.13 Dial-up mode 266

It is inevitable that customers want to use the Maestro Industrial 10 for modem dial-up connections made from PCs running Windows or other operating systems. During this mode the Maestro Industrial 10 bypasses ALL internal functions and only act as a modem. The user can now do dial-up at speeds up to 115200baud.
(TIP: this setting can also be used for uploading new firmware to the GSM module)

Write format:
!266 <0/1>

0 : Normal TruTalk mode
1 : Dial-up mode

5.46.14 Data Flushing Delay 267

Some devices connected to a Maestro Industrial 10 are very timing critical when it comes to data flow. To avoid TCP packets segmentation and partial buffer flushing one can use command 267 to first wait a given time, before flushing the buffer as a constant output string.

Write format:
!267 <time-out>

<time-out> is specified in X100msec

6 APPENDIX A

7 DISCLAIMER

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NOTE: This product is **not designed or certified** for use as medical equipment or with medical equipment or with medical devices. This product is also **not designed or certified** to be used with any medical services or medical related services.

8 GLOSSARY

Abbreviation	Description
API	Application programmers Interface
ASN.1	Abstract Syntax Notation One
CDR	Charge Data Record
CSV	Comma Separated Values
DB	Database
DNS	Domain Name System
FQDN	Fully Qualified Domain Name
GAIN	Gateway Application and Interface Node
HTTP	Hypertext Transfer Protocol
HTTPS	HTTP Secure
IVR	Interactive Voice Response
I/O	Input/Output
IP	Internet Protocol
MMS	Multimedia Message Service
MMSC	Multimedia Messaging Service Centre
PDA	Personal Digital Assistant
SMSC	Short Message Service Centre
SMPP	Short Message Peer to Peer Protocol
USSD	Unstructured Supplementary Services Data
WIG	Wireless Internet Gateway
WAP	Wireless Application Protocol
WML	Wireless Mark-up Language
WASP	Wireless Application Service Provider
XML	Extensible Markup Language

9 REVISION INFORMATION

Date	Version	Comments	Author
10 November 2010	1.0	Port to new Maestro Industrial 10 platform functions only	Eric Guldemond
29 November 2010	1.1	Fixed analog scaling calculation !58	Eric Guldemond

10 WARNINGS

WARNING: Do not open this equipment under any circumstances. High risk of electrical shock exists that may and probably will lead to injuries and/or death.

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