



TECHNICAL NOTE

DATE
11-01-00

SeeDOS Ltd
cwalters@seedos.com

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NUMBER
4426-00

SUBJECT: MAX-4000 BI-DIRECTIONAL RS232 PROTOCOL

The following information is provided as a service to our users and customers:

1. Unit will operate in Print-Only mode by default.
 - a) Output is sent automatically
2. Unit will only respond to Device Clear Command (CTRL-C) when in Print-Only mode.
3. Sending a Device Clear (CTRL-C), the device will respond with the prompt “=>” followed by <CR><LF>.
4. When a command is sent to the unit, the unit parses it, executes it, and returns a response (if applicable) followed by <CR><LF> and a prompt indicating the status of the command followed by <CR><LF>. The commands can not be nested. The host must wait for a response before sending another command.
 - a) “=>” No errors detected and command was successful.
 - b) “?>” Command error was detected. Command not executed because it was not understood.
 - c) “!>” An execution error was detected. Command syntax was correct but was not executed successfully.
 - d) “%” Battery Low symbol will be appended to the prompt if the unit is in battery low mode.
5. Command Set - All commands start with an “*” and end with a “?”, i.e., *IDN?.
 - a) *IDN? - Return device identification, serial #, and last calibration date.
 - b) Format as follows: MAX 4000 E001234 01012000
 - c) *PRT? - Puts device in Print-Only mode.
 - d) *STATUS? – Returns status of unit.
 - i) 0 – No operation currently in progress
 - ii) 1 – Unit is auto zeroing
 - iii) 2 – Unit is collecting charge
 - iv) 4 – Unit is in overload

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- e) *MODE? – Returns current mode unit is in.
 - i) WARM_UP_MODE = 2
 - ii) ZERO_MODE = 3
 - iii) ZERO_PROGRESS_MODE = 4
 - iv) ZERO_DONE_MODE = 5
 - v) RANGE_SELECT_MODE = 6
 - vi) BIAS_MODE = 7
 - vii) RATE_MODE = 8
 - viii) CHARGE_MODE = 9
 - ix) RATE_CHARGE_MODE = 10
 - x) COLLECT_CHARGE_MODE = 11
 - xi) COLLECT_RATE_CHARGE_MODE = 12
 - xii) BATT_CHARGE_MODE = 13
 - xiii) OVERLOAD_MODE = 14

- f) *AUZ? – Perform Auto Zero
 - i) Not valid during charge collection
 - ii) Must be performed on currently selected input range before rate or charge commands are issued.
 - iii) Starts immediately. Most commands will be invalid during zeroing.
See specific command descriptions.

- g) *RNG? - Returns currently selected input range
 - i) 0 - low range
 - ii) 1 - high range

- h) *RNG<value>? – Sets input range to <value> and puts unit into range select mode.
 - i) Not valid during a Charge Collection
 - ii) Not valid during auto-zeroing
 - iii) Only the following values are valid:
 - a) 0 – low range
 - b) 1 – high range

- i) *NEEDZ? – Returns whether selected range needs autozeroing.
 - i) Valid only during range select mode.
 - ii) 0 – No, selected range does not need autozeroing.
 - iii) 1 – Yes, selected range does need autozeroing.



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- j) *RATE? – Puts unit into Rate Mode and Print Mode.
 - i) Not valid during zeroing.
 - ii) Command not valid during a Charge Collection
 - iii) Currently selected input range must have been previously zeroed

- k) *CURRATE? – Returns current rate value.
 - i) Only valid in Rate mode and during Rate Charge collection.

- l) *CHG? - Puts unit into Charge mode.
 - i) Not valid during zeroing.
 - ii) Not valid during charge collection.
 - iii) Currently selected input range must have been zeroed.

- m) *CHG<value>? – Puts unit into Charge mode.
 - i) Not valid during zeroing.
 - ii) Value is charge collection time in seconds, ie 015, 030, 045,...
 - iii) Value range must be between 15-600 seconds in multiples of 15, or MAX. Any other value generates an execution error.
 - iv) Not valid during charge collection
 - v) Currently selected input range must have been previously zeroed

- n) *RTCHG? - Same as *CHG?, except put unit in Rate-charge mode.

- o) *RTCHG<value>? – Same as *CHG<value>? Except puts unit in Rate Charge mode.

- p) *CURCHG? – Returns current collected charge value.
 - i) Only valid during Charge and Rate Charge collection.

- q) *START? – Starts Charge Collection Mode.
 - i) Valid only if in Charge mode or Charge/Rate modes if not currently collecting.
 - ii) Unit goes into Print-Only mode.

- r) *STOP? – Stops a Charge Collection
 - i) Valid only if in Charge or Charge/Rate modes and currently collecting.

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- ii) Need to send CTRL-C (Device Clear) to exit Print-Only mode, then this command to stop a charge collection.

- s) *BIAS? - Returns current DC bias level.
 - i) 100 = 100% (300V)
 - ii) 50 = 50% (150V)
 - iii) 0 = 0% (0V)
 - iv) -50 = -50% (-150V)
 - v) -100 = -100% (-300V)

- t) *BIAS<value>? – Sets high voltage DC bias level and puts unit into bias mode.
 - i) Selected range must have been zeroed.
 - ii) Value must be one of the following: 100, 50, 0, -50, -100.
 - iii) Not valid during Print-Only mode.
 - iv) Not valid during Warm-up mode.
 - v) Not valid during Autozero mode.
 - vi) Not valid during Charge Collection mode.

- u) *BATT? – Returns the percent left of battery capacity.

- v) *SER? – Returns serial number
 - i) Returns 7 character serial number

- w) *SER<XXXXXXXX>? - Stores serial number
 - i) Must be 7 characters in length
 - ii) Calibration jumper must be installed or value will not be stored

- x) *CALDATE? – Returns Last Calibration Date
 - i) Returned Format = MMDDYYYY

- y) *CALDATE<value>? – Sets Calibration Date
 - i) Format = MMDDYYYY