

DENT Instruments
ELITE^{pro} and DATA^{pro} Recorders:
Simplified Interface

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The Pro Series of loggers has a simplified user interface that allows third party software to perform such functions as retrieve data, read and set clock, and other tasks in a “simple” manner. The interface is designed to be used primarily with routine data collection programs such as MV-90 or handheld devices. The simplified interface can also be used by handheld data readers micro-computers (palm tops) and Windows CE devices.

The simplified interface is *not* capable of setting up the logger for a monitoring session. ELOG 98a or higher (the DENT Instruments Windows application for Epro and Dpro loggers must be used for that purpose).

Any terminal program such as Procomm or Hyperterminal can now be used for one-time or routine data collection by issuing the ASCII commands described below. Additional simple commands are being added to the loggers for specialized applications. If you have any questions about the commands or their functions please contact:

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Format of the command descriptions that follow:

1. The actual command is shown in **bold**.
2. Some commands have an optional argument which is shown in brackets [], e.g., [mm/dd/yy hh:mm]. When using the optional arguments **do not** include the brackets in the command.
3. The first line following the command is a brief description of the function of the command.
4. The next text provides greater description of how the command or how it is used.
5. Lastly, there is an example of the command and what is returned from the logger when the command is used. The “command” line is what the computer sends to the logger and “returns” refers to what the logger sends to the computer.

A couple of nuances to be aware of: READ THESE!

1. The command syntax must be exact. For example, a missing or extra space voids the command.
2. For direct RS-232 connections to the logger there is a 15 second timeout. After 15 seconds the logger goes to “sleep.” If a command is sent while the logger is asleep, the first character will be used to “wake the logger up” resulting in the command being missed. While communicating with modems the timeout is 90 seconds.
3. To ensure that the logger is “awake,” send an **Enter** before each command. If awake upon receiving an Enter, the logger will return a line feed, carriage return and prompt (>). If the logger is asleep upon receiving an Enter, the logger will wake up and give a carriage return and prompt only.

4. Some commands result in the logger giving a line feed and carriage return followed by what the command asks for. Some commands only give a carriage return (without a line feed) followed by what the command asks for. In the description of the commands the words “line feed” appear after commands where a line feed is returned by the logger and “no line feed” where there is none.
5. Important Communication Protocols: Set the remote host to communicate at **57600 baud** (or whatever baud rate the logger is set to), **8 data bits, Parity = None, 1 stop bit, Flow control = None.**

An Example Routine Data Collection Set of Commands

In its simplest form, data retrieval consists of sending a **SELECT** command to tell the logger what date range of data is desired followed by an **EXPORT** command that begins the data transmission.

Typical Data Collection Session Commands—Computer calls the logger

First Call to Logger:

PC Commands	Function
<enter>	Wakes the logger, Returns a prompt (>)
ID	Returns the logger serial number
HEADINGS	Returns the time stamp and data column headings
SELECT /*	Tells the logger to choose all data in the logger for downloading
EXPORT	Tells the logger to begin downloading the data

Second and Subsequent Calls to the Logger:

PC Commands	Function
<enter>	Wakes the logger, Returns a prompt (>)
SELECT /* mm/dd/yy hh:mm	Tells the logger to choose all data from mm/dd/yy hh:mm to the last data record for downloading. Where mm/dd/yy hh:mm should be the record following the <i>last</i> record from the previous download.
EXPORT	Tells the logger to begin downloading the data

An additional, optional command would be **C! [date time]** to update the logger clock to the PC’s clock.

It may also be desired to use the **\$?** Command prior to HEADINGS to turn off the character echo from the logger. That will prevent the command names from being added into the downloaded data file.

If the logger originates the call the last command issued to the logger should be S! (see below).

The argument mm/dd/yy hh:mm = month/day/year hour:minute of the first record to be exported. All data from the time specified (inclusive) through the last record in the logger (most recent) will be downloaded when the logger receives the EXPORT command.

The SELECT /* [mm/dd/yy hh:mm] is most often used for on-going data collection projects where only **new** data is desired and it is to be automatically appended to the existing data file. There are other SELECT commands available and they are described below.

Example: command >SELECT /* 09/14/98 14:00<enter> (line feed)
 returns >

EXPORT

Exports data according to the last SELECT command received by the logger.

Example: command >EXPORT<enter> (no line feed)
 returns 1,10/01/98,16:39:00,+0073.2,0,000.00
 2,10/01/98,16:40:00,+0073.2,0,000.00
 3,10/01/98,16:41:00,+0073.9,0,000.00
 :
 :
 9,10/01/98,16:47:00,+0073.5,0,000.00
 10,10/01/98,16:48:00,+0073.4,0,000.00
 (line feed and carriage return)
 (second line feed, without a prompt)

The data continues to be sent until the SELECT command is satisfied
There is no prompt after the end of the data

Note: Since the logger keeps track of the last data record the logger sent it is not always necessary to use a SELECT command with EXPORT. An EXPORT command issued to the logger without a SELECT command preceding it will cause the logger to download its data beginning with the first record in the logger following *the last* downloaded record. The danger in not sending SELECT with each data download occurs when 2 or more computers are used to download data from the same logger(s). The logger has no record of *who* last requested data, only what data it sent. Multiple computers accessing the same logger may have gaps in their data if each computer does not send a SELECT command prior to retrieving data.

C?

Returns logger's clock time in a hh:mm:ss mm/dd/yy format. The clock uses a 24 hour format.

Example: command >C?<enter> (line feed)
 returns 15:42:52 09/18/98
 >

C! hh:mm:ss mm/dd/yy

Sets logger's real-time clock.

This command is used to keep the logger's clock in synchronization with a host computer that is doing the data retrieval and to compensate for any drift in the logger clock. The logger clocks *do not* compensate for daylight savings time.

Example: command >C! 18:44:00 09/18/98<enter> (line feed)
 returns (second line feed and carriage return)
 >

Additional Commands

SELECT /1 mm/dd/yy hh:mm

Sets the logger to EXPORT only one data record at the date and time specified.

Format and function is similar to the SELECT /* command described above.

SELECT /H mm/dd/yy hh:mm - Sets the logger to EXPORT all data from the time specified in the argument (inclusive of the argument time) until the end of the hour (exclusive of the beginning of the next hour).

The number of records that are retrieved with this command depend on the integration interval set in the logger and the time given in the argument. For example, if the logger is set to record 5 minute interval data and the argument time in the minutes section (mm) of the SELECT command is xx:40 then 4 records will be returned (xx:40, xx:45, xx:50, xx:55).

Format and function is similar to the SELECT /* command described above.

SELECT /D mm/dd/yy hh:mm - Sets the logger to EXPORT all data from the time specified in the argument (inclusive of the argument time) until the end of the day (exclusive of midnight). The number of records actually retrieved depends on the time specified in the argument and the integration interval set in the logger as described in SELECT /H, above.

Format and function is similar to the SELECT /* command described above.

VERSION

Returns EPROM (logger software) version number

DENT loggers are continually being improved, enhanced and given new capabilities. The EPROM version number is most often used by the factory for trouble-shooting and to answer questions about features and capabilities in the logger.

Example: command >VERSION<enter> (no line feed)
 returns EUC1B.085
 >

2. COMMANDS FOR SETTING UP THE LOGGER TO CALL THE COMPUTER

The Pro Series of Loggers have the capability to originate a data download session. This feature is particularly useful when sharing a telephone line at the site. The commands described above apply equally to sessions where the logger originates the call.

The logger can be configured to periodically call a telephone number and send its data to the PC that answers the call using the simple commands that follow. It is usually easier to set the logger call-out schedule using the DENT Instruments logger software **ELOG 98a** (or higher) but it can also be done with the **SCHEDULE** commands below.

The PC must have a modem and terminal program that is capable of answering the incoming call. After connection the terminal program would send the appropriate commands as described above to retrieve data and set the logger clock as desired.

*All sessions where the logger originates the call must end with an **S!** command (see below).*

PHONE

Returns the telephone number the logger will call to download data.

Example: command >PHONE<enter> (no line feed)
 returns 15413884774
 >

PHONE [number]

Sets the telephone number for logger to call.

PHONE [number] supports commas used to cause delays needed for PBX telephone systems. A comma adds 1-2 seconds delay each before dialing the next number.

Example: command >PHONE 9,18003880770<enter> (no line feed)
 returns 9,18003880770
 >

SCHEDULE /C

Clears (erases) the current call-out schedule in the logger.

Before sending a new call-out schedule a SCHEDULE /C command should be sent to clear any previous schedule that may be in the logger.

Example: command >SCHEDULE /C<enter> (line feed)
 returns (line feed and carriage return)
 >

SCHEDULE /1 hh:mm dd

Logger calls out *one time only* at the time & date specified.

For all SCHEDULE commands (including those described below) the argument value “**dd**” corresponds to the day of the month it is desired to have the logger call out. Note: if, for example, dd is set to 7 and the day on which it is set is the 8th of the month then the logger will not call out until the 7th of the next month. Also, if dd is set to 31 and the month in which it is set has only 30 or fewer days then the logger will not make a call until the 31st of the next month that has 31 days in it. Note also that the argument hh:mm dd **is mandatory** for this command. Also, there must be a space between SCHEDULE and the /x and the date and time argument.

Example: command >SCHEDULE /1 01:00 22<enter> (line feed)
 returns (second line feed and carriage return)
 >

SCHEDULE /D hh:mm dd

Logger calls out once *every day* at the time specified in hh:mm and starting on day of the month “dd”

Example is the same as for SCHEDULE /1

SCHEDULE /W hh:mm dd

Logger calls out once *every week* at time specified starting at day of month “dd”

The logger will call every week on the same day of the week (Monday, Tuesday...) that corresponds with dd. Note: If the day of the week corresponding to “dd” next occurs in the month following the month when the SCHEDULE command is sent to the logger, then the weekday that the logger will call corresponds to the day of the week that is “dd” in the following month.

Up to seven (7) SCHEDULE /W commands may be sent to the logger; one (and only one) for each day of the week.

Example is the same as for SCHEDULE /1

SCHEDULE /M hh:mm dd

Logger calls out once *every month* on the “dd” day of the month and at the time specified.

Up to thirty-one (31) SCHEDULE /M commands may be sent to the logger; one (and only one) for each day of the month.

Example is the same as for SCHEDULE /1

Simplified Interface Command Summary

All Firmware Versions

Command

<enter> key - Tells the logger to execute the command that precedes the <enter>. Also used to “wake” the logger before sending commands

\$? – Turns off logger character echo.

\$! – Turns on logger character echo.

ID - Returns logger serial number

VERSION - Returns EPROM version number

HEADINGS - Exports headings of Columns

SELECT /1 mm/dd/yy hh:mm – Sets Logger to output a single record of data at time listed

SELECT /H mm/dd/yy hh:mm - Sets Logger to output data from time listed to end of hour

SELECT /D mm/dd/yy hh:mm - Sets Logger to output data from time listed to end of day

SELECT /* mm/dd/yy hh:mm - Sets Logger to output data from time listed through remaining

SELECT /* - Sets Logger to output *all* data in the logger

[mm/dd/yy hh:mm] = month/day/year hour:minute of data to start export

EXPORT – Begins data down load per SELECT command. If no SELECT is sent prior to receiving an EXPORT command the logger sends all data collected *since the last* Export.

C?- Returns logger’s time [hh:mm:ss mm/dd/yy]

C! hh:mm:ss mm/dd/yy- Sets Logger’s clock

PHONE – Returns logger telephone number logger calls for data downloads

PHONE number - Sets phone number for logger to call

SCHEDULE /1 hh:mm dd - Sets logger to call out one time only at time on day dd

SCHEDULE /D hh:mm dd - Sets logger to call out every day at hh:mm starting on day dd

SCHEDULE /W hh:mm dd - Sets logger to call out every week at time hh:mm on *day of week* dd

SCHEDULE /M hh:mm dd -Sets logger to call out every month at hh:mm on day of month dd

(Can only have one “SCHEDULE /1”, one “SCHEDULE /D”, can have up to seven

“SCHEDULE /W”, and thirty-one “SCHEDULE /M”)

SCHEDULE /S hh:mm dd –Maintenance mode, normal schedule is in suspense until a **SCHEDULE /R**” is received or until another “SCHEDULE” is sent- It calls every day at hh:mm starting at dd.

SCHEDULE /R- Resumes normal schedule

SCHEDULE /V- View Call-out Schedule

SCHEDULE /C- Clear Call-out Schedule

S!- Tells logger that Scheduled session is satisfactory completed, call again at next scheduled time. If logger doesn’t get an “S!”, it will recall in about 2 minutes after the disconnect to complete the scheduled maintenance.

Always end a logger-originated session with an S!<enter> .

Additional Simplified Interface Commands
Requires ELITEpro Firmware Version xxxx.056 or Higher
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READ CHx – Returns the real-time values for Channel “x.” X can be any channel 1-6 but the channel must be enabled in the logger Setup Table

READ PEAK – Returns the kW Peak Demand value with the date and time stamp marking the *beginning* of the demand period

CLEAR PEAK – Clears the kW Peak Demand register

READ TOTALS – Returns the values in the kWh, kVARh, and kVAh totalizer registers. A value is present only if one or more recording flags have been turned on in the Setup Table. (For example, to get a kWh Total, at least one of the Average kW, Maximum kW, Minimum kW, or kWh boxes in the Setup Table for that channel must be checked.)

CLEAR TOTALS – Resets all of the kWh, kVARh, and kVAh totalizer registers. Does not affect any time series data stored in the logger or the Peak kW Demand register.

STOP LOGGING – Turns logging off (does not clear the memory).

START LOGGING – Resumes logging immediately following a STOP LOGGING command. Assumes a valid Setup Table exists in the logger. (Does not clear memory on logging start.)

START LOGGING hh:mm mm/dd/yy – Starts data logging at the future time specified. If the logger is already logging, logging is stopped when the command is sent. The schedule is only set if the specified time is in the future. (Note: If there is data already in the logger then START LOGGING with a date/time clears the memory when logging resumes.)

CLEAR MEMORY – Turns logging off and clears the logger interval data in memory (Does not clear the kWh, kVARh, kVAh totalizer registers or peak kW demand register).

READ CLOCK – Returns logger’s time [hh:mm:ss mm/dd/yy] (Same as C?)

SET CLOCK hh:mm:ss mm/dd/yy – Sets Logger’s clock. Note: To change the clock time but not date only the hh:mm:ss need be entered. To change the date, the time must also be entered. (Same as C!)

Note: *When using the Simplified Interface to retrieve data that has 3, 15, or 30 second integration intervals, the time stamps for the data will only show hours:minutes:00. The seconds will not be shown.*