

Datalogger ESC8800

Datalogger ESC8800 communication protocol

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Supported device types and versions

The protocol supports communication with ESC 8800 dataloggers.

Implementation was performed and verified according to the **ESC Model 8800 – datalogger Engineering Manual – TIN 97-1023, February 1997** documentation for the datalogger software version 6.

Communication includes:

Table 1

Measurement type	I/O tag type	Communication function	Documentation
Current values	AI	PRINT MINUTE	Command Response String 6 – 16, 17
Current values flags	DI	PRINT MINUTE	Command Response String 6 – 16, 17
1m averages	AI	PRINT MINUTE	Command Response String 6 – 16, 17
1m average flags	DI	PRINT MINUTE	Command Response String 6 – 16, 17
30m averages	AI	PRINT AUX	Command Response String 6 – 14, 15
30m average flags	DI	PRINT AUX	Command Response String 6 – 14, 15
60m averages	AI	PRINT HOUR	Command Response String 6 – 7, 8
60m average flags	DI	PRINT HOUR	Command Response String 6 – 7, 8
Digital inputs	DI	SENSE IN	Command Response String 6 – 9, 10
Calibrations	AI	PRINT CAL	Command Response String 6 – 12, 13
Real-time – writing	TOA	SET TIME	Command Response String 6 – 20

Communication line configuration

- Communication line category: [Serial](#)
- Baud rate according to the ESC datalogger settings - the command CENTRAL SPEED,
- 1 stop bit,
- 8 data bits,
- No parity,
- No handshaking.

Communication station configuration

- Communication protocol: **ESC 8800**.
- The station address is a number within the range of 0..255 specified as a decimal number or as a hexadecimal number with a hash at the beginning (e.g. #0A). The station address must be identical to the datalogger settings - the SET ID command.

Station configuration is different from implementation in the versions D2000 v3.XX. The station time parameters and their priorities are used, one datalogger device must be divided into logical stations as follows:

- Current values: the **delay** at least 1 second, **station priority** 0. Current measurements of channels and digital inputs are configured at this station. This is a logical station with the lowest priority, the *delay* parameter may not be less than 1 second.
Note: Datalogger 8800 does not provide any current data - the data are acquired from one-minute averages. Therefore it is not necessary to create the station.
- 1m averages - the **period** 1 minute, the **offset** 5..10 seconds, **station priority** 1. One-minute averages of channel measurements are configured at this station. This is a logical station with a higher priority, the parameter offset shouldn't be less than 5 seconds - this is the time provided for the datalogger for processing values.
- 30m averages - the **period** 30 minute, the **offset** 5..10 seconds, **station priority** 2. Thirty-minute averages of channel measurements are configured on this station. This is a logical station with even higher priority, the parameter offset shouldn't be less than 5 seconds - this is the time provided for the datalogger for processing values. Setting the period to 30 minutes must be initialized in the datalogger by using the command "**SE T INT 30**".

- Calibrations – station with a required period for reading calibration results.

Station protocol parameters

The following station protocol parameters can be defined:

Table 2

Keyword	Full name	Meaning	Unit	Default value
RC	Retry Count	The number of request repeats in case of a communication error.	-	2
RT	Retry Timeout	The delay between individual request repeats in case of a communication error.	ms	1000 ms.
WFT	Wait First Timeout	The delay after transmitting the request before reading the response.	ms	500 ms.
WT	Wait Timeout	The delay between response readings until its finalization.	ms	400 ms.
MWR	Max Wait Retry	The number of repeats of response readings until its finalization.	-	8
GSI	Get Stored Interval	The size of the period, for which the archive data from the datalogger are read without interruption. The period is specified in minutes. If the value of the period is e.g. 60 minutes, so all archive data from e.g. 05:00 to 06:00 are read, then data from 06:00 to 07:00 etc. The reading of archive data from this period shouldn't take more than one minute, because otherwise some of the current data, acquired among archive readings, could be lost.	min	10 min.
VP	Validity Percent	Valid measurement percentage for declaring the measured interval valid.	%	67.000

A string containing the protocol parameters is defined as follows:

Keyword=value;Keyword=value; ...

Example:

RC=1;RT=500;MWR=10;

If a keyword with an invalid value is used in the initialization string, the corresponding default value according to the table 2 will be used.

I/O tag configuration

Support of communication with ESC 8800 comprises acquisition and setting of the following values:

- reading of current values of measured parameters with flags,
- reading of 1m, 30m, and 60m averages with their respective flags,
- reading of current states of digital inputs,
- reading of calibration results.
- setting the real-time.

Current value configuration

I/O tag type is Ai, measurement type is **ACTUAL**. The channel number is defined as a number within the range of 0..99 either specified as a decimal number or as a hexadecimal number with a hash at the beginning (e.g. #0A).

Configuration of current value flags

Current values flags are DI type (Digital Input). The measurement type is **ACTUAL Flag**.

Note: The *No missing data* <blank> flag can be configured using the character _ (underline) for clarity.

Configuration of 1m, 30m, and 60m averages

The averages are values of AI type (Analog Input). Measurement type is **1m AV** for one-minute averages, **30m AV** for half-hour averages, and **60m AV** for hour averages. Channel number is defined as a number within the range of 0..99 either specified as a decimal number or as a hexadecimal number with a hash at the beginning (e.g. #0A).

Flag configuration of 30m and 60m averages

Flags of averages are values of DI type (Digital Input). The measurement type is **30mAV FLAG** for half-hour averages and **60mAV FLAG** for hour averages.

Note: The *No missing data* <blank> flag can be configured using the character (underline) for clarity.

Digital input configuration

Digital inputs are values of DI type (Digital Input). The measurement type is **Dig.Input**. The number of Digital input is defined as a decimal number within the range of 0..999.

Configuration of calibration results

Calibration results are values of AI type (Analog Input). The measurement type is **CAL-Ph1** for the first calibration phase or **CAL-Ph2** for the second calibration phase. Channel number is defined as a number within the range of 0..99 either specified as a decimal number or as a hexadecimal number with a hash at the beginning (e.g. #0A).

Real-time I/O tag configuration

For each station (for each physical ESC8800 logger), one I/O tag of TOA type containing real-time can be configured. The I/O tag is necessary for real-time synchronization - datalogger -> computer.

Acquisition of archived (stored) values

The ESC 8800 datalogger performs local archiving of measured values. The values can be requested automatically when a dispatcher system breakdown is detected or directly by the dispatcher ([D2000 HI](#), [D2000 EventHandler](#)) to complete the D2000 dispatcher system archive.

The method described above allows acquiring calibration values, which are at most 30 days old, 30m averages for the last 31 days, and 1m averages for the last 60 minutes.

Literature

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Changes and modifications

- November 1999 - possibility to set a validation percentage individually for each station.

Document revisions

- Ver. 1.1 – February 8th, 2000 – Document update.



Related pages:

[Communication protocols](#)