

EVENT LOGGER S7841

Four-channel event data logger

Instruction manual

Instruction manual for S7841

Data event recorder records beginning and end of monitored event by sensing logical state of signal coming to its input from monitored object.

It is possible to download recorded values to the PC by a communication adapter.

Signals are connected to the terminals. Any change in input logical level is recorded - current value and the date and time when the change occurred. Data is stored in non-volatile memory. Events shorter than approximately 500 ms are not recorded to avoid storing of interference transients of the mechanical contacts. Data logger also records times when the record was interrupted, along with the reasons for the interruption (e.g. new configuration of the device from the PC, etc.). Data logger has four independent inputs for the monitoring of events, individually adjustable switch for connecting either potential-less contact or voltage signal. Inputs configured for sensing voltage signals are galvanically isolated from the other inputs and thus more resistant to external interference.

Setting and controlling of the logger are carried out using a computer and can be password protected. Recorder is also possible to turn on and off with the magnet (this option can be disabled from the PC program). Also delayed start on the adjusted date and time can be programmed from the PC (up to one month in advance). Turning on and off can be also controlled by the external binary signal on the channel 4.

It is also possible to operate logger with switched OFF display. Short display of actual measured values is enabled by means of magnet.

Logging mode can be adjusted as non-cyclic, when logging stops after filling the memory. In cyclic mode oldest stored values are overwritten by new.

Stored values can be transferred from logger memory to the PC by means of communication adapter. Communication adapter can be connected to the logger permanently – data logging is not interrupted even if data download appears.

Logger evaluates minimum battery voltage and its drop below allowed limit is indicated on the display. At the same time value of remaining battery capacity is available by means of the PC program and appears on the logger LCD in % (every time after switch ON).

Technical parameters of the data logger:

Number of binary inputs: 4

Signal for binary input (selection by the switch, inputs can be set individually):

from potential-less contact (inputs are mutually galvanically connected) or
two-state voltage signal (inputs are mutually galvanically isolated)

WARNING! Galvanical isolation is not designed for safety function!

Binary inputs of data logger configured for potential-less contact:

Minimum pulse length on binary input: 500 ms (shorter pulses may not be recorded)

Maximum number of changes on binary input: total sum of changes on all inputs in
10s interval must not exceed 20 (other changes will not be
recorded)

Current through closed contact: 5 μ A

Voltage across opened contact: < 3.6 V (generated by the data logger)

Maximum connected voltage on input: \pm 30 V

Binary inputs data logger configured for two-state voltage signal:

Minimum pulse length on binary input: 500 ms (shorter pulses may not be recorded)

Maximum number of changes on binary input: total sum of changes on all inputs in 10s interval must not exceed 20 (other changes will not be recorded)

Low voltage level: 0 to +2.0 V

High voltage level: +4.5 to +30 V ^{note 1}

Current into input: Maximum 1.5 mA at 30 V

Terminal block input signals: removable WAGO 734, Maximum lead cross section 1.5 mm²

Cable for connection input signals (must not be led together with power lines):

for potential-less contact: shielded, Maximum length 10 m

for voltage signal: shielded, Maximum length 30 m

Refresh interval of the LCD display: 5 s

Memory capacity:

non-cyclic record 16 254 changes of input signals

cyclic record 15 778 changes of input signals

Specified values are maximum possible and can be reached only if record since last memory erasing was not interrupted.

Communication with computer: via RS232 (serial port) by means of COM adapter or USB port by means of USB adapter; data transfer from logger via communication adapter is optical

Real time clock: adjustable from computer, integrated calendar including leap years

Error of internal RTC: < 200 ppm (i.e. 0.02 %, 17.28 s in 24 h)

Power: Lithium battery 3.6 V size AA

Battery life:

typical (data download to PC is carried out about once a week): 4 years

in continuous on-line mode with interval 1 minute: approximately 3 years

in continuous on-line mode with interval 10 seconds: approximately 1 year

Notice: The above battery lives are valid for logger operation in temperature from -5 to +35°C. If often operated outside of the above temperature range battery life can be reduced to 75%.

Protection: IP20

Operating conditions:

Temperature operating range: -30 to +70 °C

Humidity operating range: 0 to 70 %RH, non condensing

Specification of outer characteristics accordingly to Czech National Standard 33-2000-3: normal environment accordingly to appendix NM: AE1, AN1, AR1, BE1

Operational position: negligible

Logger installation: by self adhesive Dual Lock, applied to clean, flat surface

Limit conditions: temperature -40 to +70 °C, humidity 0 to 70 %RH

Storing conditions: temperature -40 to +85 °C, humidity 0 to 70 %RH

Dimensions (without terminal block): 93 x 64 x 29 mm

Weight including battery: approximately 130 g

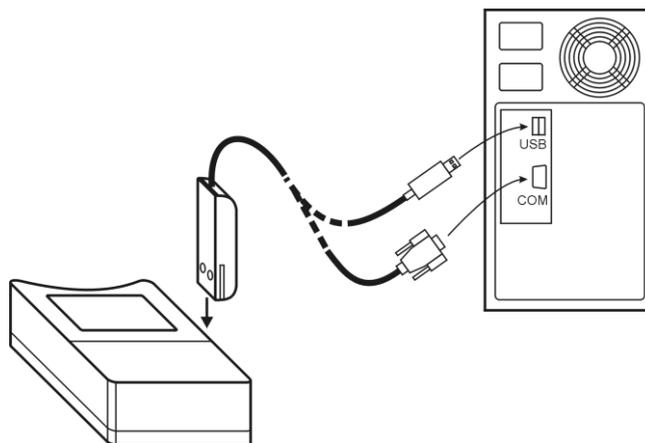
Material of the case: ABS

Note.1) If monitoring of lower than standard voltage level is required (e.g. for device with 3V power supply) and galvanical isolation of inputs is not required, configure inputs as for potential-less contact. Voltage for high level will be then >2.0 V (indicated by symbol OFF) and for low level <0.5 V (symbol ON).

Logger operation

Logger comes complete with installed battery and switched OFF. **Before putting into operation setting of inputs by means of the switches is necessary according to the type of the connection** - switches are located inside of the logger. After unscrewing of 4 corner screws remove the lid. Switch proper switches of channels to the *CONTACT* position (to be configured for connection of potential-less contacts) or to the *U* position (to be configured for connection of voltage signal). Switches are marked with numbers from 1 to 4 according to the channel numbers. Put the lid back and screw the four screws. Before operation it is necessary by means of installed user PC software to set logging parameters and other features. The PC program is common for all types of loggers Sxxxx – **for type S7841 it is necessary to have installed version 1.31.0.0** or higher. Older program version can cause logger reconfiguration together with loss of proper function! Installed program version can be verified in menu *Help / About program...* Free newest program version is available to download at www.cometsystem.cz . For communication with the PC a communication adapter is necessary (not included in delivery). For connection via RS232 serial port it is necessary to use COM ADAPTER, for connection via USB port it is necessary to use USB ADAPTER. Connect adapter connector to proper computer port and plug the adapter to the guide slots on the side of logger.

Connecting logger to the computer by means of communication adapter



Notice: USB connector can be located also at the computer front side

After connecting the logger to the computer reading of logger info is enabled by means of the PC software and also setting of the instrument accordingly to the user needs (menu *Configuration / Setting of instrument parameters*). Before logging start it is necessary:

- check or optionally set the logger real time clock
- select logging mode (cyclic or non cyclic)
- enable channels to be recorded
- switch ON the logger (or switch OFF, if delayed start by magnet or automatic is required)
- enable or disable the option to switch ON the logger by magnet
- enable or disable the option to switch OFF the logger by magnet
- set date and time of logger automatic switching ON logger or disable this option
- optionally enable to control logging by external signal (i.e. logger switch ON/OFF is controlled by binary input state at channel 4). Set required binary state for switching ON the logger from the menu of channel 4 parameters.
- switch ON or switch OFF the display of logger

- check free space in data memory, optionally erase data memory of the logger
- enter password if protection against unauthorized manipulation with the logger is necessary

Notice: If logger operates as permanently connected to the computer, using of magnet start/stop is disabled.

To enable the logger control by magnet is suitable only in cases, when possibility of unauthorized manipulation to the logger operation is eliminated.

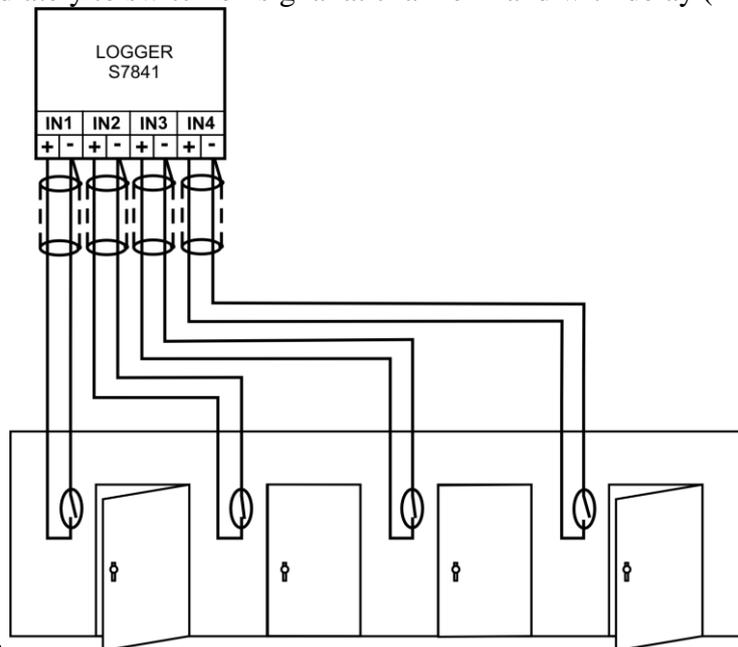
If logger is controlled by external signal (i.e. by binary state at input 4), logger will be switched OFF (when programmed binary state at input 4 appears) with the delay up to 10 s!

User description of binary states is displayed only at the data list on the computer. On the logger LCD indication ON and OFF is displayed permanently.

Connecting of the logger to the monitored device

Connect logger terminals to the monitored device by a shielded cable. As the source of the signal high quality mechanical contact (magnetic reed contact) can be used or devices with "open collector" output or devices with two-state voltage output - here it is necessary to comply with the polarity of the connected signal. Due to the high impedance of the inputs, it is necessary to install the cable to avoid places with the possibility of increased electromagnetic interference (e.g. electrical cabinets, motors, power devices containing switching elements - contactors, relays or pulse converters, etc.).

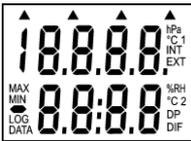
If the recorder will be controlled (switching on and off) by the external binary signal, connect the output of the master device to channel 4. When setting parameters of the device, it is necessary to allow the "Logger control by external signal" and select required binary level of channel 4 to start the logger. Recorder responds immediately to switch on signal at channel 4 and with delay (max 10



sec) to switch off signal at channel 4.

Note: Example of monitoring of door contacts - only for illustration. In this case data logger inputs are configured for potential-less contact.

Reading on the display in usual operation (logger switched ON)



After switching ON the instrument all symbols on the LCD are displayed for about 2 seconds.



Then actual date and time in logger is displayed for about 4 s.



Consequently remaining battery capacity is displayed for about 2 s (value 0 to 100%). It is valid if logger is operated at temperature from -5 to +35°C. If logger is operated often outside of the above temperature range battery life can be reduced to 75%, i.e. if displayed remaining battery capacity drops below 25%, it is recommended to replace the battery.



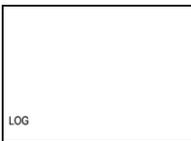
If LCD display is ON actual states on binary inputs of channel 1 and channel 2 are displayed. Symbol On indicates closed contact (resp. high voltage level), symbol OFF indicate opened or not-connected contact (resp. low voltage level). Symbol LOG indicates record in progress – if LOG blinks, data memory is occupied more than 90%.



State of other channels is displayed automatically after 5 s.

Instrument now displays actual state on binary inputs of channel 3 (upper line) and channel 4 (lower line). Symbol On indicates closed contact (resp. high voltage level), symbol OFF indicate opened or not-connected contact (resp. low voltage level)..

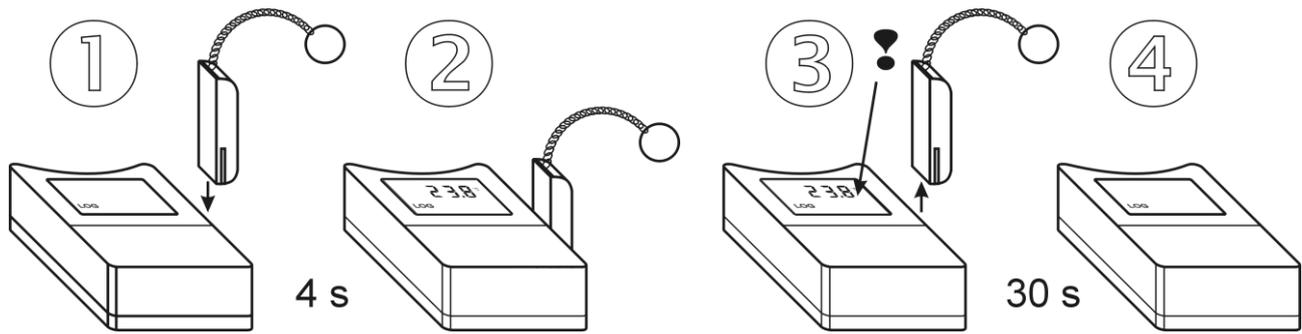
The entire cycle repeats periodically, i.e. after 5 s channel 1 and channel 2 are displayed again.



If display is OFF, the LOG symbol displayed indicates logger is ON. Symbol LOG blinks if data memory is occupied more than 90%.

If information on actual binary inputs states is needed, it is possible anytime to display reading by means of the magnet (only if communication adapter is not connected permanently). Plug magnet into guide slots from logger front side for approximately 4 s and wait till reading on the display appears. If logger has enabled the function switch OFF by magnet, resp. MIN/MAX memory clear by magnet, do not remove magnet from guide slots before decimal point symbol goes out – logger would be switched OFF, resp. MIN/MAX memory would be cleared! Display reading initialized by magnet goes out automatically after 30 s. Remove the magnet from slots anytime during actual reading is ON or later.

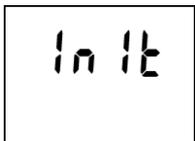
Activation of switched OFF LCD for 30 seconds by the magnet



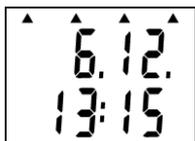
Messages displayed on the LCD beyond usual operation



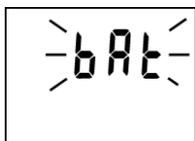
If memory in non-cyclic mode is totally full data logger is switched off and display reading is MEMO FULL. It appears also if logger is operated with switched OFF display.



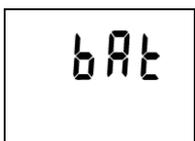
New initialization of logger can occur in switching ON the logger (immediately after displaying of all LCD segments for checking) e.g. after replacement of totally discharged battery for new one. State is indicated by INIT reading. It can be displayed for about 12 s.



If battery voltage drop occurred since last internal clock setting below critical limit or battery disconnection for longer period than approximately 30 s, after display switch ON (during date and time display) all four arrows appears as warning to check or set it again from the computer. However all logger functions work without limitation.



If reading BAT is displayed periodically on LCD upper line (for 1 s with 10 s interval), the end of estimated battery life is coming – however logger functions are not limited. Replace battery as soon as possible!



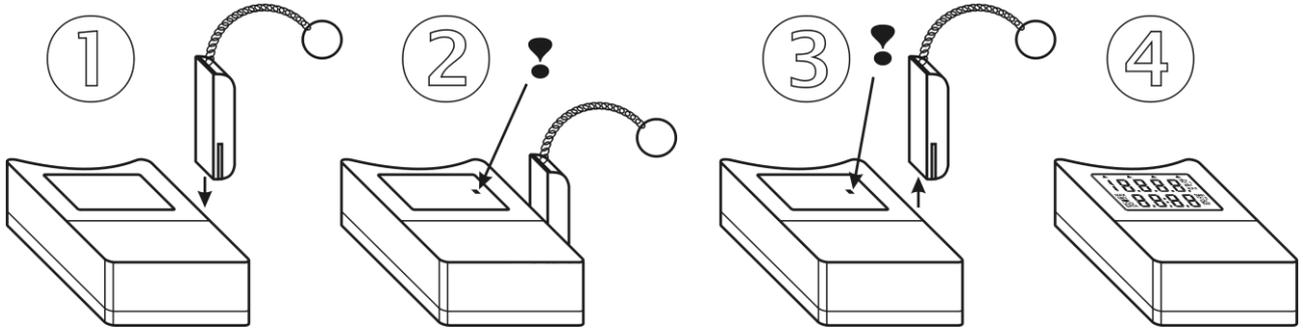
If reading BAT is displayed permanently, battery voltage is low and logger is not possible to switch ON. If logger was switched ON before it, data logging is stopped and logger is switched OFF. Communication with computer can temporarily work. Replace battery as soon as possible!

Start / stop by magnet

The function must be enabled from the PC before. If only switching OFF by magnet is enabled, it is of course necessary to switch ON the logger from the computer.

Switching the logger ON by magnet

Plug magnet to guide slots from logger front side and wait approximately 1 s for decimal point appears right on LCD upper line. After appearance it is necessary immediately (till indication point is displayed) to remove magnet from guide slots and logger switches ON.



Switching the logger OFF by magnet

The procedure is identical with the above procedure for switching ON. If decimal point does not appear after 1 s, it is necessary remove the magnet and repeat the procedure.

Battery replacement

Low battery is indicated on the display by blinking of reading "BAT". It can be displayed permanently, if battery voltage is too low. Replace the battery for new one. If logger is operated often in temperature below -5°C or over $+35^{\circ}\text{C}$ and PC program indicates remaining battery capacity below 25% it is also recommended to replace the battery. Applied is Lithium battery 3.6 V, size AA. Battery is located under logger lid.

Warning: near battery fragile glass reed contact is located – be careful not to damage it. Be careful in battery replacement!

Replacement procedure:

- switch off the logger by the PC program or by magnet (if low battery allows)
- unscrew four corner screws and remove the lid
- remove old battery by pulling the glued tape
- insert new battery **respecting the correct polarity** (see symbols + and – near battery holder). If you connect new battery up to 30 s, all logger settings remain unchanged. In the opposite case check by means of PC program all settings, especially the real time clock in logger. **Attention, inserted battery with incorrect polarity causes logger damage!**
- put the lid back again and screw four screws. Be careful to have the rubber sealing properly in the slot and tighten the screws properly to ensure the water resistance of the instrument.
- connect logger to the computer and **write to it the information on battery replacement** (menu Configuration/Battery replacement). This step is necessary to evaluate properly the remaining battery capacity.

Old battery or logger itself (after its life) is necessary to liquidate ecologically!

Instrument passed through tests of electromagnetic compatibility (EMC):

Device conforms in accordance with EN 61326-1 these norms:

- | | |
|------------|---|
| radiation: | EN 55011 Class B |
| immunity: | EN 61000-4-2 (levels 4/8 kV, Class A) |
| | EN 61000-4-3 (intensity of electric field 3 V/m, Class A) |
| | EN 61000-4-4 (levels 1/0.5 kV, Class A) |
| | EN 61000-4-6 (intensity of electric field 3 V/m, Class A) |