Electronic-Key-System

Additional manual
EKS *Light* and *Light FSA*

Order no. 2513217

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Table of contents

1 General notes

1.1 Use of the additional manual

This manual describes the additional operating states 2 to 7 for expanded applications. It is based on the EKS *Light* and *Light FSA* manual (order no. 110845), which describes the simple operating states 0 and 1.

The additional operating states can be used with the following devices:

- Compact Electronic-Key adapter EKS-A-IPL-G01-ST05/02 (order no. 109820); this device supports all operating states
- Compact Electronic-Key adapter EKS-A-IPLA-G01-ST05/04 (order no. 112207); this device supports all operating states; version *FSA* (**F**or **S**afety **A**pplications)
- Modular Electronic-Key adapter EKS-A-SFH…in combination with modular interface adapter EKS-A-APR-G08 (order no. 113647); this device supports all operating states
- Modular Electronic-Key adapter EKS-A-SFH…in combination with modular interface adapter EKS-A-APRA-G08 (order no. 113645); this device supports all operating states; version *FSA* (**F**or **S**afety **A**pplications)

As the operating states were introduced at different intervals, older devices might not support one of the following operating states. This information will be provided in the section for the respective operating state. Both the version numbers and the time as of which the operating state was established in the device are listed there.

1.2 Scope of the additional manual

The EKS *Light* and *Light FSA* manual (order no. 110845) describes the technical features and functions of the EKS *Light* read stations (also referred to as “device” below). The manual can be downloaded from www.euchner.com. Simply enter the order number in the search box.

The applications AP000200 (selection of operating mode with EKS *Light FSA* and touchscreen) and AP000225 (selection of operating mode with EKS *Light* and pushbuttons) additionally describe the operating principle in the system. Enter the application number in the search box.

These descriptions supplement the manual, and they describe the expanded functions in operating states 2 to 7 in particular.

The additional manual and the EKS *Light* and *Light FSA* manual (order no. 110845) form the overall documentation for the device.

2 EKS *Light* with initial pulse on the outputs Operating states 2 and 3

2.1 Use

Some users require a higher level of protection against tampering on the 4-bit data line for the EKS *Light*. External bridging of the static signals shall be prevented. This is why operating states (OS) 2 and 3 with initial pulse on outputs A, B, C, D and Strobe were introduced. Each time the Electronic-Key is placed, the control system recognizes the predefined initial signals with a special sequence of High/Low values and then receives the output of the static value for the access level (AL) between 0_{hex} and F_{hex}.

2.2 Technical basics

Operating states (OS) 2 and 3 are established for the following read stations:

- Compact Electronic-Key adapter EKS-A-IPL-G01-ST05/02 (order no. 109820); this device supports all operating states;
  from version 02.05.08 - July 2011
- Compact Electronic-Key adapter EKS-A-IPLA-G01-ST05/04 (order no. 112207); this device supports all operating states; version *FSA* (**F**or **S**afety **A**pplications);
  from version 03.05.08 - July 2011
- Modular interface adapter EKS-A-APR-G08 (order no. 113647); this device supports all operating states;
  all versions
- Modular interface adapter EKS-A-APR-G08 (order no. 113645); this device supports all operating states; version *FSA* (**F**or **S**afety **A**pplications);
  all versions

Electronic-Key recognition in operating state 2 functions the same way as in operating state 0 (see EKS *Light* and *Light FSA* manual). Electronic-Key recognition in operating state 3 functions the same way as in operating state 1 (see EKS *Light* and *Light FSA* manual). Signal output on the 4-bit data line functions as described below.

2.3 DIP switch settings in operating states 2 and 3

(Refer to chapter 4.1, “Function of the DIP switches,” in the EKS *Light* and *Light FSA* manual or to the label on the device.)

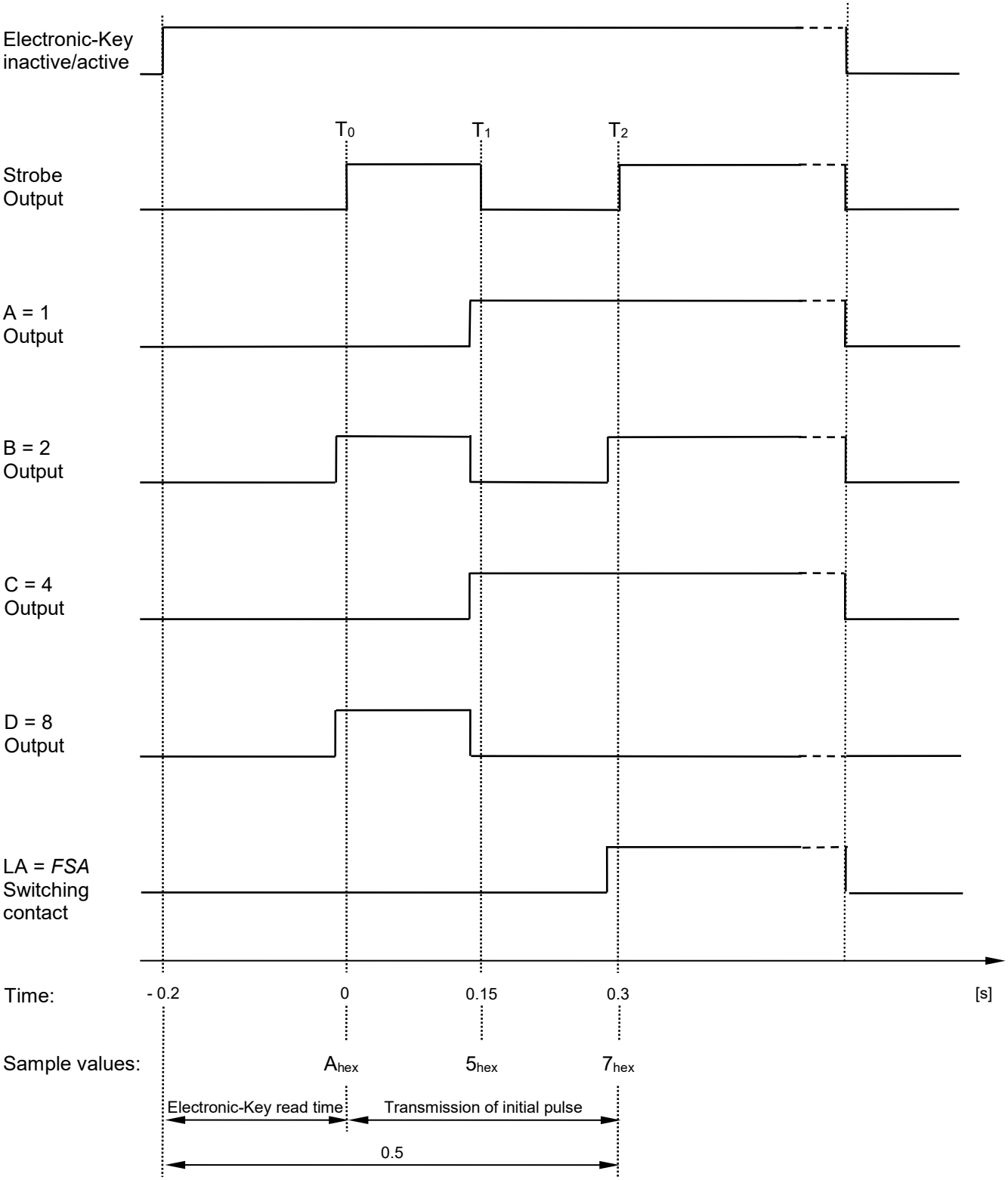
- To select operating state (OS) 2: Set switch S1.5 to ON
- To select operating state (OS) 3: Set switches S1.5 and S1.6 to ON

2.4 Description of the output signals in operating states 2 and 3 and external evaluation

When the read station recognizes an authorized Electronic-Key, an initial pulse is output on the five outputs A, B, C, D and Strobe in a sequence described in the pulse time diagram below. The access level (AL) is statically output on the 4-bit data line approx. 0.5 second after Electronic-Key placement and the typical, initially coded signal sequence with the values A_{hex} and 5_{hex} (static output as in operating state 0 or 1).

The control system must evaluate this coded signal sequence. The control system must issue a release only if it recognizes the values within the defined time slot. The customer is responsible for this part of the programming. It is practically impossible to tamper with this coded signal sequence by using wire jumpers, because it takes place in a brief interval.

2.4.1 Pulse time diagram



2.4.2 Description of the signal sequence in the time diagram

Time	Approx. 0.2 second after the Electronic-Key is placed...
T_0	Rising edge of Strobe signal output. Value A_{hex} set at the output of the 4-bit data line.
T_1	Falling edge of Strobe signal output. Value 5_{hex} set at the output of the 4-bit data line.
T_2	Rising edge of Strobe signal output. The access level (AL) value between 0_{hex} and F_{hex} programmed in the Electronic-Key is set at the output of the 4-bit data line. With the *FSA* (**F**or **S**afety **A**pplications) version, switching contact LA (*FSA* version only) additionally closes at time T_2.

Information!
The fixed values A_{hex} and 5_{hex} are output in the defined sequence during the recognition phase between times T_0 and T_2. This procedure and these values are used to monitor all A, B, C and D lines for open circuit and short circuits.

Information!
The initial pulse on the five outputs A, B, C, D and Strobe after placement of the Electronic-Key does not include a safety function.

2.5 Parameter assignment of the Electronic-Keys via the Electronic-Key-Manager EKM software

(Refer to chapter 8, “Parameter assignment...,” in the EKS *Light* and *Light FSA* manual)

Select the value 02 or 03 in the EKM EKS *Light* input mask for the EKS operating state (OS). The further parameter assignment procedure is identical to the one for operating states 00 and 01.

3 EKS *Light* sequential code SC (with sequential 4-bit digit transmission) Operating states 4 and 5

3.1 Use

Some users require a longer individual code for expanded use of the EKS *Light*. Four 4-bit digits are additionally output for expanded serialization in EKS *Light* operating state (OS) with sequential code (SC). The operator parameterizes this sequential code (SC) on an application-specific basis. These four digits permit unique identification of 65,536 individual Electronic-Keys (with hexadecimal numbering) or 9,999 individual Electronic-Keys (with decimal numbering). It is thereby possible to assign further data from a database to the Electronic-Key after it has been recognized by the control system, for example.

The EKS operating state (OS), a sequential code (SC), an access level (AL), an access code (AC), a checksum (cyclic redundancy check (CRC)) and a serial number are stored on the Electronic-Key.

Sequential data transmission is required to provide such a function due to the 4-bit data line. Operating states (OS) 4 and 5 with sequential 4-bit digit transmission on outputs A, B, C and D have been introduced for this purpose. The Strobe signal supplies the trigger signal to distinguish between the different telegram cycles. These four digits are designated as the sequential code (SC) below.

3.2 Technical basics

Operating states (OS) 4 and 5 are established for the following read stations:

- Compact Electronic-Key adapter EKS-A-IPL-G01-ST05/02 (order no. 109820); this device supports all operating states;
  from version 02.06.10 - October 2014
- Compact Electronic-Key adapter EKS-A-IPLA-G01-ST05/04 (order no. 112207); this device supports all operating states; version *FSA* (**F**or **S**afety **A**pplications);
  from version 03.06.10 - October 2014
- Modular interface adapter EKS-A-APR-G08 (order no. 113647); this device supports all operating states;
  from version 05.06.10 - January 2015
- Modular interface adapter EKS-A-APR-G08 (order no. 113645); this device supports all operating states; version *FSA* (**F**or **S**afety **A**pplications);
  from version 06.06.10 - January 2015

Electronic-Key recognition in operating state 4 functions the same way as in operating state 0 (see EKS *Light* and *Light FSA* manual). Electronic-Key recognition in operating state 5 functions the same way as in operating state 1 (see EKS *Light* and *Light FSA* manual). Signal output on the 4-bit data line functions as described below.

3.3 DIP switch settings for operating states 4 and 5

(Refer to chapter 4.1, “Function of the DIP switches,” in the EKS *Light* and *Light FSA* manual or to the label on the device.)

- To select operating state (OS) 4: Set switch S1.4 to ON
- To select operating state (OS) 5: Set switches S1.4 and S1.6 to ON

3.4 Description of the data telegram for the sequential code

The data telegram consists of six 4-bit digits (data type: nibble):

SC_1	SC_2	SC_3	SC_4	AL	BCC

1. SC_1: Sequential code - digit 1
2. SC_2: Sequential code - digit 2
3. SC_3: Sequential code - digit 3
4. SC_4: Sequential code - digit 4
5. AL: Access level (AL) (same as in OS 0 and OS 1)
6. BCC: Block check character

Information!
Values from 0_{hex} to F_{hex} (hexadecimal notation) can be defined respectively output at each digit position.

3.5 Description of the block check character

The EKS *Light* automatically calculates the block check character (BCC). This value is the arithmetic result of an XOR combination of the previous five 4-bit digits:

BCC = ((((SC1 XOR SC2) XOR SC3) XOR SC4) XOR AL)

Example: The BCC is calculated as follows for the sequential code (SC) 1-9-2-0 in combination with access level (AL) 9:

SC_1 $= 1_{hex}$ $= 0001$

SC_2 $= 9_{hex}$ $= 1001$

SC_3 $= 2_{hex}$ $= 0010$

SC_4 $= 0_{hex}$ $= 0000$

AL $= 9_{hex}$ $= 1001$

BCC = (((0001 XOR 1001) XOR 0010) XOR 0000) XOR 1001

= ((1000 XOR 0010) XOR 0000) XOR 1001

= (1010 XOR 0000) XOR 1001

= 1010 XOR 1001

= 0011

= 3_{hex}

3.6 Description of the outputs in operating states 4 and 5 and external evaluation

When the read station recognizes a valid Electronic-Key, the Strobe output begins clocking at a frequency of 10 Hz until the complete data telegram has been transmitted. The rising edge of the Strobe signal indicates that a new digit is available on the 4-bit data line. Once the complete telegram has been transmitted, all outputs are set to the static High level until the Electronic-Key is removed. Switching contact LA (*FSA* version only) is closed only when all data has been transmitted and as long as the Electronic-Key remains in place.

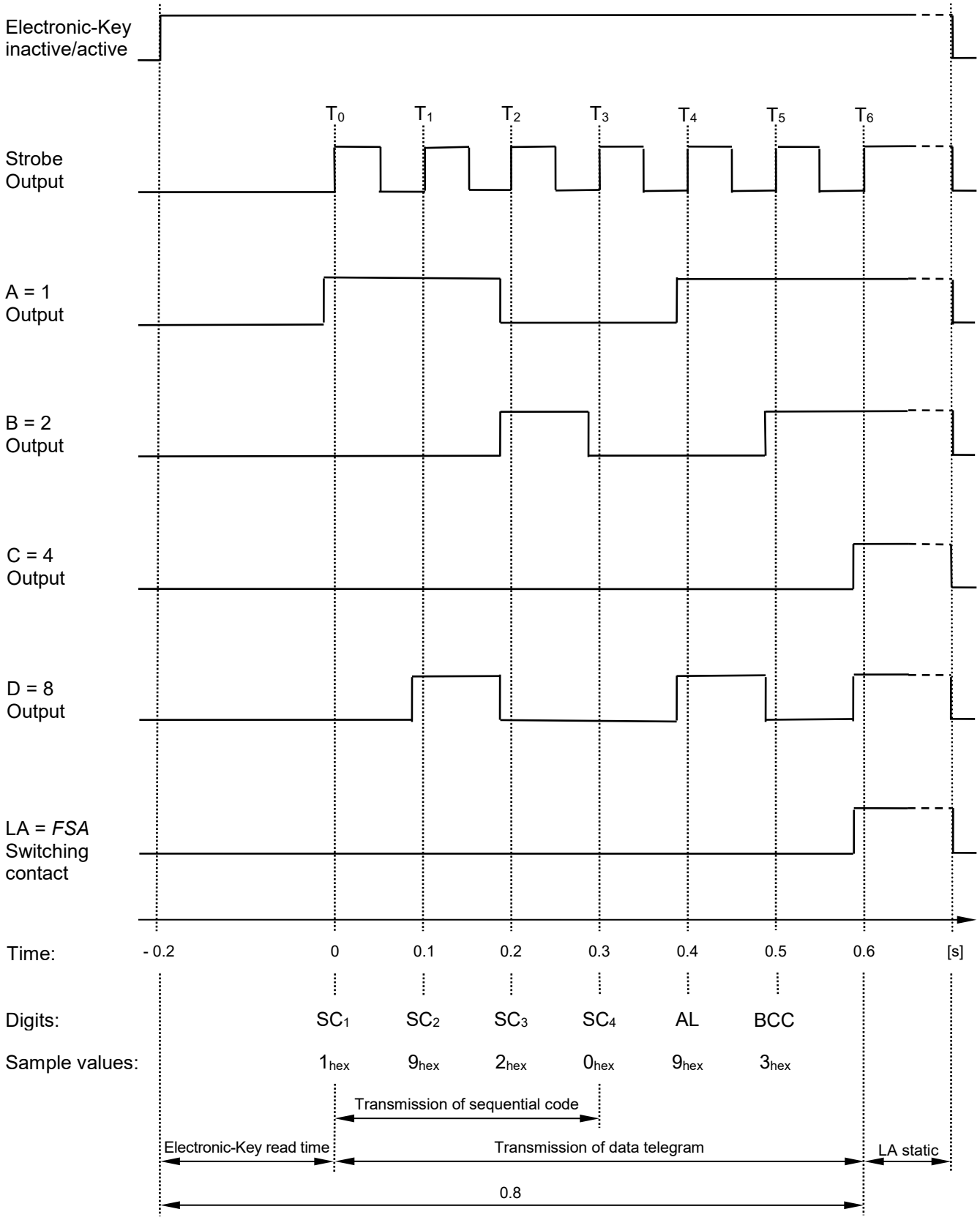
The device can assume the following states, and the data is provided in the following steps:

- Initial state: all outputs set to Low, and *FSA* contact open. This state remains in effect until a valid Electronic-Key is placed, plus an additional 0.2 s after the Electronic-Key is recognized.
- Strobe cycles at 10 Hz. Outputs A, B, C and D transmit data at 10 Hz. *FSA* contact still open. This state remains in effect until all data has been transmitted: duration 0.6 s.
- All outputs set to High, and *FSA* contact closed. This state begins as soon as all data has been output, and it remains in effect until the Electronic-Key is removed. This state will not be triggered if the Electronic-Key is removed before the data has been transmitted.

The states and the sequentially transmitted data can be evaluated externally in the control system:

- All lines A, B, C and D must be at Low level before the Strobe output begins clocking at a frequency of 10 Hz.
- Optional data telegram integrity check: the BCC (see description in chapter 3.5) should be recalculated by external means as a function of the first five 4-bit digits. The calculated BCC value must then be compared with the received BCC value, and both values must be exactly the same. Introducing this optional routine can achieve a high degree of certainty of correct data reception.
- As soon as the Strobe output switches to the static High level, all lines A, B, C and D must also be at High level.

3.6.1 Pulse time diagram



3.6.2 Description of the signal sequence in the time diagram

Time	Approx. 0.2 second after the Electronic-Key is placed...
T_0	Rising edge of Strobe signal output. The SC_1 value (e.g. 1) is set at the output of the 4-bit data line.
T_1	0.1 second after T_0. Rising edge of Strobe signal output. The SC_2 value (e.g. 9) is set at the output of the 4-bit data line.
T_2	0.1 second after T_1. Rising edge of Strobe signal output. The SC_3 value (e.g. 2) is set at the output of the 4-bit data line.
T_3	0.1 second after T_2. Rising edge of Strobe signal output. The SC_4 value (e.g. 0) is set at the output of the 4-bit data line.
T_4	0.1 second after T_3. Rising edge of Strobe signal output. The AL value (e.g. 9) is set at the output of the 4-bit data line.
T_5	0.1 second after T_4. Rising edge of Strobe signal output. The BCC value (e.g. 3) is set at the output of the 4-bit data line.
T_6	0.1 second after T_5. Rising edge of Strobe signal output. All outputs are set to High level, and switching contact LA (*FSA* version only) is closed until the Electronic-Key is removed.

Information!

- Outputs A, B, C, D and Strobe must be at Low level and switching contact LA (*FSA* version only) must be open before time T_0.
- The six 4-bit digits defined in the data telegram are output in the defined sequence during the data transmission phase between times T_0 and T_6.
- All outputs must be at High level and switching contact LA (*FSA* version only) must be closed before time T_6.

All lines A, B, C, D, Strobe and *FSA* can be externally checked for interruption using this procedure and these values.

Information!
The pulsed signals between times T_0 and T_6 after Electronic-Key placement do not include a safety function.

3.7 LED indicator

(Refer to chapter 5.7, “LED indicator,” in the EKS *Light* and *Light FSA* manual)

LEDs in three colors indicate the devices’ operating state.

Color	Signal	Operating state	Description
green	static	ready	Device ready.
yellow	static	Electronic-Key active; access	A valid Electronic-Key has been placed, and access is granted. The LED steadily illuminates yellow. This state begins at time T_6 as soon as the data telegram has been output.
red	various	no access	As for OS 0 and OS 1; see EKS *Light* and *Light FSA* manual.

3.8 Data in the Electronic-Key memory in operating states 4 and 5

The programmed data block on the Electronic-Key is 8 bytes long (in operating states 4 and 5).

Block byte no.:													0	1	2	3
Electronic-Key byte no.:	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
Function:	Freely available for further EKS applications												Assigned for...			

Block byte no.:	4	5	6	7								
Electronic-Key byte no.:	112	113	114	115	116	117	118	119	120	121	122	123
Function:	OS 4 and 5				Serial number							

3.9 User access in operating state 4

Prerequisites for user access

1. Operating state 4 (value 04) is set on the device using DIP switches.
2. Access code (value 0 to 1023) is set on the device using DIP switches.
3. Parity bit check within the DIP switches in the device is conclusive.
4. Operating state 4 (value 04) is programmed on the Electronic-Key via EKM.
5. Digits of the sequential code are programmed with any values on the Electronic-Key via EKM.
6. Access code (value 0 to 1023) is programmed on the Electronic-Key via EKM.
7. Access level (value 0 to 15) is programmed on the Electronic-Key via EKM.

Conditions for user access

1. Values for operating state in the device and on the Electronic-Key match.
2. Values for access code in the device and on the Electronic-Key match exactly.
3. Cyclic redundancy check is conclusive.

Issuance of user access

1. The Strobe output clocks at a frequency of 10 Hz, and the 4-bit data output transmits the sequential code (SC), the access level (AL) and the block check character (BCC).
2. Strobe and the 4-bit data outputs are statically set to the High level as soon as data transmission is complete. Switching contact LA (*FSA* version only) is closed.

3.10 User access in operating state 5

Prerequisites for user access

1. Operating state 5 (value 05) is set on the device using DIP switches.
2. Access code (bit pattern) is set on the device using DIP switches.
3. Parity bit check within the DIP switches in the device is conclusive.
4. Operating state 5 (value 05) is programmed on the Electronic-Key via EKM.
5. Digits of the sequential code are programmed with any values on the Electronic-Key via EKM.
6. Access code (bit pattern) is programmed on the Electronic-Key via EKM.
7. Access level (value 0 to 15) is programmed on the Electronic-Key via EKM.

Conditions for user access

1. Values for operating state in the device and on the Electronic-Key match.
2. Individual bits of the access code in the device and on the Electronic-Key match.
3. Cyclic redundancy check is conclusive.

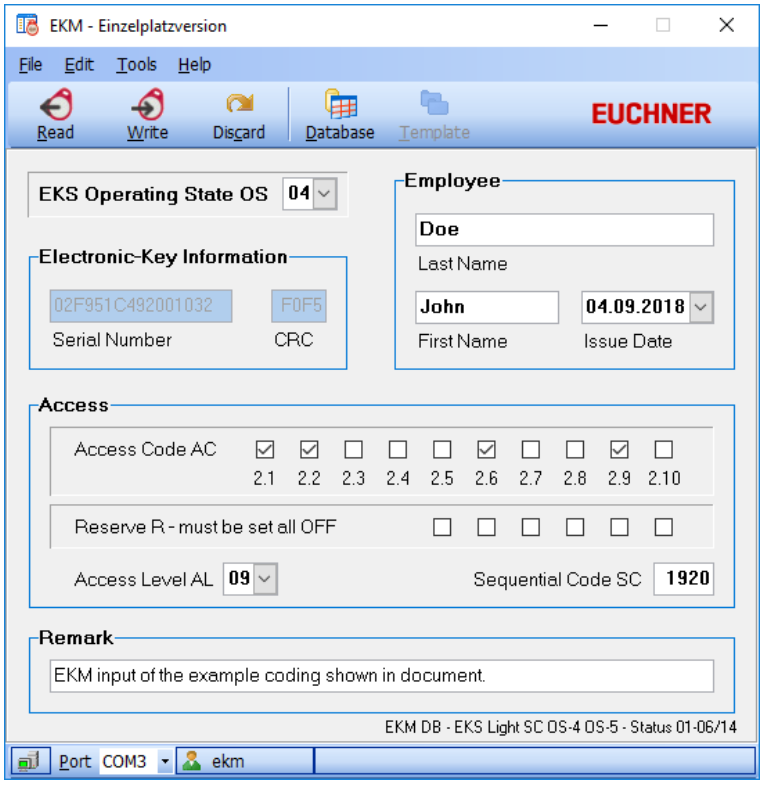
Issuance of user access

1. The Strobe output clocks at a frequency of 10 Hz, and the 4-bit data output transmits the sequential code (SC), the access level (AL) and the block check character (BCC).
2. Strobe and the 4-bit data outputs are statically set to the High level as soon as data transmission is complete. Switching contact LA (*FSA* version only) is closed.

3.11 Parameter assignment of the Electronic-Keys via the Electronic-Key-Manager EKM software

A special EKM application (EKM DB) is required for programming Electronic-Keys for the EKS operating state (OS) 4 or 5. It is available from the Support department on request.

EKM input mask for the operating states (OS) 4 and 5:



The values entered here correlate with the sample coding stated in chapters 3.6.1 and 3.6.2.

The input mask can be customized with the aid of the Electronic-Key-Manager EKM software.

Perform Electronic-Key parameter assignment in the following sequence:

1. Select required value for operating state (OS) 04 or 05.
2. Enter the required access code (AC) in binary form corresponding to the DIP switch setting (2.1 to 2.10). Important: It is essential to set the reserve bits (R) to OFF (as shown in the figure above). Remove the ticks from the check boxes if necessary.
3. Select the desired access level (AL).
4. Enter the sequential code (SC) with 1 to 4 digits. Values from 0_{hex} to F_{hex} can be entered at each digit position.
5. Further administrative inputs, such as the employee name, issue date or remarks, are optional and are not necessary for the function of EKS *Light*.
6. Write data onto the Electronic-Key.

4 EKS *Light* mode of safe operation MSO for use in combination with selection of operating mode Operating states 6 and 7

4.1 Use

The EKS *Light* can be used in combination with functionally safe selection of operating mode. Operating states (OS) 6 and 7 Mode of safe operation MSO were introduced for this purpose. Each time the Electronic-Key is placed, the control system recognizes the predefined initial signals with a special sequence of High/Low values and then receives the output of the static value for access rights to a mode of safe operation MSO_x.

The EKS operating state (OS), a mode of safe operation (MSO), an access code (AC), a checksum (cyclic redundancy check (CRC)) and a serial number are stored on the Electronic-Key.

4.2 Technical basics

Operating states (OS) 6 and 7 are established for the following read stations:

- Compact Electronic-Key adapter EKS-A-IPL-G01-ST05/02 (order no. 109820); this device supports all operating states;
  from version 02.07.12 - March 2017
- Compact Electronic-Key adapter EKS-A-IPLA-G01-ST05/04 (order no. 112207); this device supports all operating states;
  version *FSA* (**F**or **S**afety **A**pplications);
  from version 03.07.12 - March 2017
- Modular interface adapter EKS-A-APR-G08 (order no. 113647); this device supports all operating states;
  from version 05.07.12 - March 2017
- Modular interface adapter EKS-A-APRA-G08 (order no. 113645); this device supports all operating states;
  version *FSA* (**F**or **S**afety **A**pplications);
  from version 06.07.12 - May 2016

Electronic-Key recognition in operating state 6 functions the same way as in operating state 0 (see EKS *Light* and *Light FSA* manual). Electronic-Key recognition in operating state 7 functions the same way as in operating state 1 (see EKS *Light* and *Light FSA* manual). Signal output on the 4-bit data line functions as described below.

4.3 DIP switch settings for operating states 6 and 7

(Refer to chapter 4.1, “Function of the DIP switches,” in the EKS *Light* and *Light FSA* manual or to the label on the device.)

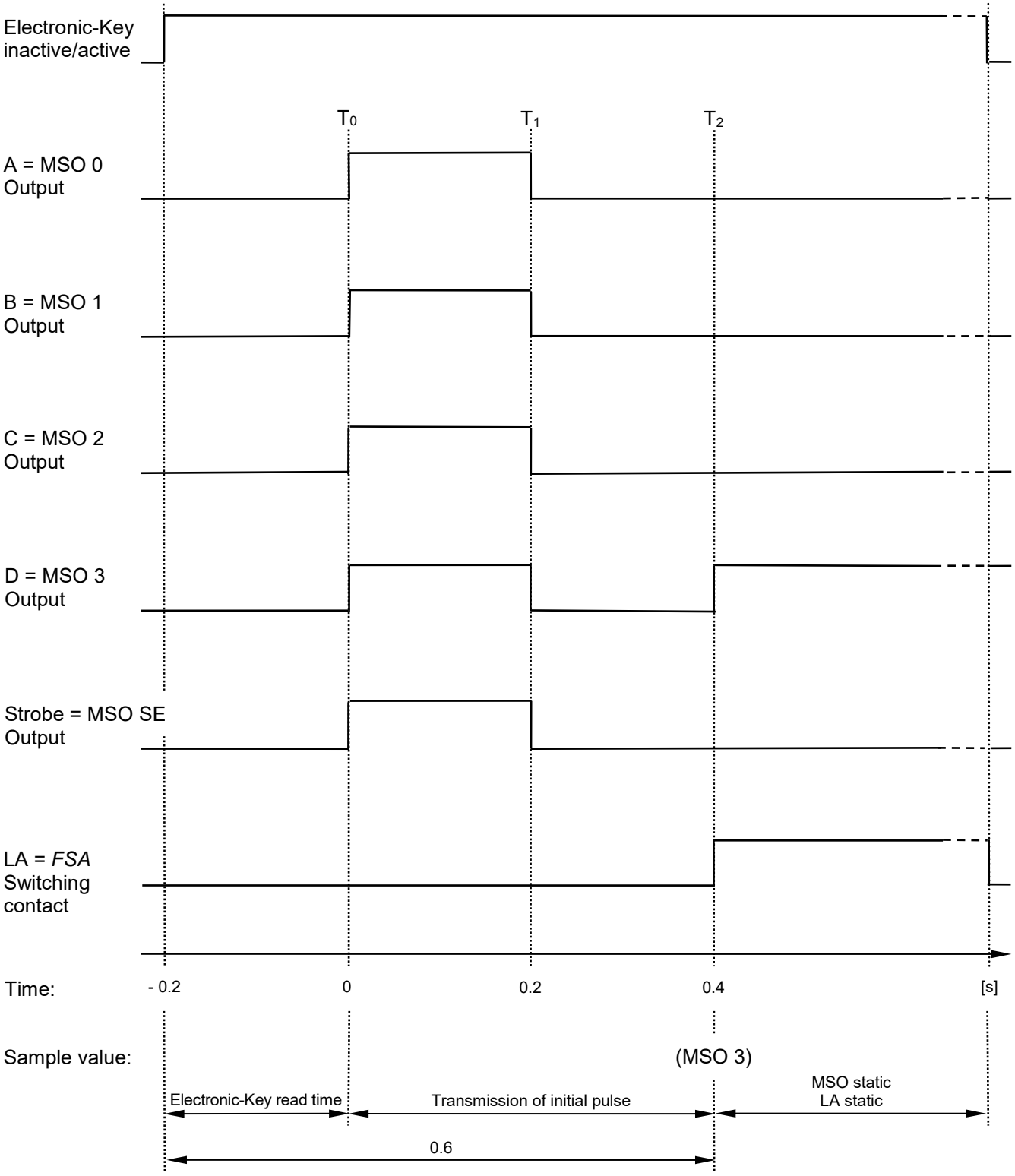
- To select operating state (OS) 6: Set switches S1.4 and S1.5 to ON
- To select operating state (OS) 7: Set switches S1.4, S1.5 and S1.6 to ON

4.4 Description of the outputs in operating states 6 and 7 and external evaluation

When the read station recognizes a valid Electronic-Key, all outputs are set to High level for 0.2 s and then to Low level for 0.2 s. The output is then set according to the mode of safe operation programmed on the Electronic-Key. Switching contact LA (*FSA* version only) is closed only once the initial pulse has been transmitted completely and as long as the Electronic-Key remains in place.

The control system must evaluate this coded signal sequence. The control system must issue a release only if it recognizes the values within the defined time slot. The customer is responsible for this part of the programming. It is practically impossible to tamper with this coded signal sequence by using wire jumpers, because it takes place in a brief interval.

4.4.1 Pulse time diagram



4.4.2 Description of the signal sequence in the time diagram

Time	Approx. 0.2 second after the Electronic-Key is placed...
T_0	Rising edges of all outputs.
T_1	0.2 second after T_0. Falling edges of all outputs.
T_2	0.2 second after T_1. Rising edge of the output of the mode of safe operation (MSO 3 in the example) programmed on the Electronic-Key, and switching contact LA (*FSA* version only) is closed until the Electronic-Key is removed.

Information!

- Outputs A, B, C, D and Strobe must be at Low level and switching contact LA (*FSA* version only) must be open before time T_0.
- The output of the corresponding mode of safe operation must be at High level and switching contact (*FSA* version only) must be closed after time T_2. Only one of the outputs A, B, C, D or Strobe is set to High level at a time.

Information!
The initial pulse sequence between times T_0 and T_2 after Electronic-Key placement does not include a safety function.

4.5 LED indicator

(Refer to chapter 5.7, “LED indicator,” in the EKS *Light* and *Light FSA* manual)

LEDs in three colors indicate the devices’ operating state.

Color	Signal	Operating state	Description
green	static	ready	Device ready.
yellow	static	Electronic-Key active; access	A valid Electronic-Key has been placed, and access is granted. The LED steadily illuminates yellow. This state begins at time T_2 after transmission of the initial pulse.
red	various	no access	As for OS 0 and OS 1; see EKS *Light* and *Light FSA* manual.

4.6 Data in the Electronic-Key memory in operating states 6 and 7

The programmed data block on the Electronic-Key is 7 bytes long (in operating states 6 and 7).

Block byte no.:														0	1	2
Electronic-Key byte no.:	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
Function:	Freely available for further EKS applications													Assigned for...		

Block byte no.:	3	4	5	6								
Electronic-Key byte no.:	112	113	114	115	116	117	118	119	120	121	122	123
Function:	OS 6 and 7				Serial number							

4.7 User access in operating state 6

Prerequisites for user access

1. Operating state 6 (value 06) is set on the device using DIP switches.
2. Access code (value 0 to 1023) is set on the device using DIP switches.
3. Parity bit check within the DIP switches in the device is conclusive.
4. Operating state 6 (value 06) is programmed on the Electronic-Key via EKM.
5. Access code (value 0 to 1023) is programmed on the Electronic-Key via EKM.
6. Mode of safe operation (value MSO 0, 1, 2, 3, SE) is programmed on the Electronic-Key via EKM.

Conditions for user access

1. Values for operating state in the device and on the Electronic-Key match.
2. Values for access code in the device and on the Electronic-Key match exactly.
3. Cyclic redundancy check is conclusive.

Issuance of user access

1. Initial pulse is transmitted.
2. As soon as the initial pulse transmission is complete, the corresponding output is statically set to High level. Switching contact LA (*FSA* version only) is closed.

4.8 User access in operating state 7

Prerequisites for user access

1. Operating state 7 (value 07) is set on the device using DIP switches.
2. Access code (bit pattern) is set on the device using DIP switches.
3. Parity bit check within the DIP switches in the device is conclusive.
4. Operating state 7 (value 07) is programmed on the Electronic-Key via EKM.
5. Access code (bit pattern) is programmed on the Electronic-Key via EKM.
6. Mode of safe operation (value MSO 0, 1, 2, 3, SE) is programmed on the Electronic-Key via EKM.

Conditions for user access

1. Values for operating state in the device and on the Electronic-Key match.
2. Individual bits of the access code in the device and on the Electronic-Key match.
3. Cyclic redundancy check is conclusive.

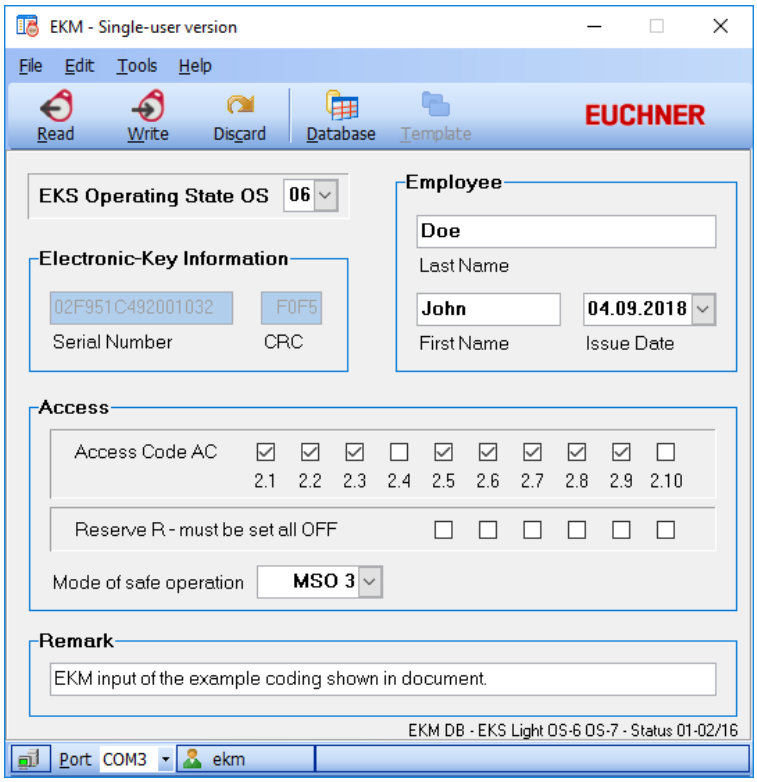
Issuance of user access

1. Initial pulse is transmitted
2. As soon as the initial pulse transmission is complete, the corresponding output is statically set to High level. Switching contact LA (*FSA* version only) is closed.

4.9 Parameter assignment of the Electronic-Keys via the Electronic-Key-Manager EKM software

A special EKM application (EKM DB) is required for programming Electronic-Keys for the EKS operating state 6 or 7. It is available from the Support department on request.

EKM input mask for the operating states (OS) 6 and 7:



The values entered here correlate with the sample coding stated in chapters 4.4.1 and 4.4.2.

The input mask can be customized with the aid of the Electronic-Key-Manager EKM software.

Perform Electronic-Key parameter assignment in the following sequence:

1. Select required value for operating state (OS) 06 or 07.
2. Enter the required access code (AC) in binary form corresponding to the DIP switch setting (2.1 to 2.10). Important: It is essential to set the reserve bits (R) to OFF (as shown in the figure above). Remove the ticks from the check boxes if necessary.
3. Select the required mode of safe operation (MSO).
4. Further administrative inputs, such as the employee name, issue date or remarks, are optional and are not necessary for the function of EKS *Light*.
5. Write data onto the Electronic-Key.

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