

CLAIMS

1. A system (1), comprising
 - a communication station (3, 4) for communicating with a number of radio tags (7-14) in a time slot communication process, in which a number of time slots (Z1-ZN) per time slot cycle in a repeating sequence are available for communication, and each time slot (Z1-ZN) is characterized by a distinct time slot symbol (ZS1-ZSN), wherein the communication station is designed to send out a synchronization data signal (SD) comprising the time slot symbol (Z1-ZN) for the currently present time slot (Z1-ZN), and wherein
 - a radio tag (7-14) is designed:
 - + for changing from a sleep state (S) into an active state (E) at a wakeup instant (TA1), and
 - + for receiving the synchronization data signal (SD) in the active state (E) and,
 - + if the received time slot symbol (ZS1-ZSN) indicates a time slot (Z1-ZN) intended for it, for defining a new wakeup instant (TA2) corresponding to the next appearance of the time slot (Z1-ZN) intended for it in a time slot cycle that follows the currently present time slot cycle.
2. The system (1) according to claim 1, wherein the radio tag (7-14), if the received time slot symbol

(ZS1-ZSN) indicates a time slot (Z1-ZN) not intended for it, is designed to define a new wakeup instant (TA2) in the currently present time slot cycle that corresponds to the next appearance of the time slot (Z1-ZN) intended for it if the time slot (Z1-ZN) intended for it will still appear in the currently present time slot cycle, or in the time slot cycle that follows the currently present time slot cycle if the time slot (Z1-ZN) intended for it will no longer appear in the currently present time slot cycle.

3. The system (1) according to one of the preceding claims, wherein the radio tag comprises a memory stage (26) for storing parameters of the time slot communication process, and the radio tag (7-14) is designed to access and consider these parameters for defining the new wakeup instant (TA2).
4. The system (1) according to one of the preceding claims, wherein the radio tag (7-14) comprises a memory stage (26) for storing a representation of the time slot symbol (ZS1-ZSN) that indicates the time slot (Z1-ZN) intended for it.
5. The system (1) according to claim 4, wherein the representation of the time slot symbol (ZS1-ZSN) is realized with a hardware address of the radio tag (7-14) that clearly identifies the radio tag (7-14), and unchangeably programmed into the memory stage (26).
6. The system (1) according to claim 5, wherein aforesaid representation of the time slot symbol is realized by the least significant bit or least significant byte of the hardware address.

7. The system (1) according to one of the preceding claims, wherein the radio tag is designed to check whether a time slot symbol known to it corresponds with one present upon receiving the synchronization data signal.
8. The system (1) according to one of the preceding claims, wherein the communication station is designed for generating the time slot symbol as the consecutive number of the respective time slot corresponding to its appearance in the sequence of time slots in the time slot cycle.
9. The system (1) according to one of the preceding claims, wherein
 - the communication station (3, 4) is designed to embed address data (AD) into the synchronization data signal (SD), which can be used to individually address a number of radio tags (7-14) per time slot (Z1-ZN) intended for aforesaid radio tag (7-14), and
 - the radio tag (7-14), if the received time slot symbol (ZS1-ZSN) indicates a time slot (Z1-ZN) intended for it, is designed to evaluate the synchronization data signal (SD) for the contained address data (AD), and to check whether it is individually addressed.
10. The system (1) according to claim 9, wherein the communication station (3, 4) is designed to generate the address data (AD) utilizing one or several bits or bytes (B3, B2, B1) of a hardware address of the radio tag (7-14) that distinctly identifies a radio tag (7-14), in particular

leaving out the least significant bits or the least significant bytes (B0).

11. The system (1) according to one of the preceding claims, wherein

- the communication station (3, 4) is designed to embed command data (CD) into the synchronization data signal (SD), with which a command can be transmitted to a radio tag (7-14) in a time slot (Z1-ZN) intended for aforesaid radio tag (7-14), and
- the radio tag (7-15), if the received time slot symbol (ZS1-ZSN) indicates a time slot (Z1-ZN) intended for it, is designed to evaluate the synchronization data signal (SD) for the contained command data (CD) and execute the command.

12. The system (1) according to claim 11, when dependent on claim 9 or 10, wherein the radio tag (7-14) is designed to evaluate the command data (CD) and execute the command when individually addressed with the help of the address data (AD).

13. The system (1) according to claim 11 or 12, wherein

- the radio tag (7-14) is designed to execute a command as a single time slot command, and conclude the executed command within a single time slot (Z1-ZN) in which the command was received.

14. The system (1) according to claim 13, wherein

- the radio tag (7-14), during completion of the executed command, is designed to generate confirmation data (ACD) and deliver the confirmation data (ACD) in the time slot (Z1-ZN) in which the command was received.
15. The system (1) according to claim 14, wherein
- the radio tag (7-14) for delivering the confirmation data (ACD) is formed in a first part (36) of the time slot (Z1-ZN), which is chronologically localized after the synchronization data signal (SD), and leaves an ensuing second part (37) of the time slot (Z1-ZN) untouched prior to the appearance of the synchronization data signal (SD) of the following time slot (Z1-ZN).
16. The system (1) according to claim 14 or 15, wherein
- the radio tag (7-14), when several radio tags (7-14) are addressed with the help of the address data (AD), is designed to evaluate not just its own address, but also those of the other addressed radio tags (7-14), and deliver its confirmation data (ACD) within a time window provided for delivering the confirmation data (ACD) at the instant corresponding to the sequence in the group of addressed radio tags (7-14) ascertained for it by the determined addresses.
17. The system (1) according to claim 11 or 12, wherein

- the radio tag (7-14) is designed for executing a command as a multiple time slot command over several time slots (Z1-ZN).
18. The system (1) according to claim 17, wherein the multiple time slot command relates to a data transmission from the communication station (3, 4) to the radio tag (7-14), and
- the communication station (3, 4) is designed to transmit the overall data divided into several time slots (Z1-ZN), wherein one data packet (DAT1-DAT3) per time slot (Z1-ZN) is transmitted as part of the overall data, and the respective time slot (Z1-ZN) uses a second part (37) of the respective time slot (Z1-ZN) adjoining the first part (36) of the respective time slot (Z1-ZN) for data transmission.
19. The system (1) according to claim 17 or 18, wherein
- the radio tag (7-14) is designed to generate and deliver partial confirmation data (ACD1-ACD3) in each time slot (Z1-Z3) in which the multiple time slot command is executed.
20. The system (1) according to claim 19, wherein
- the radio tag (7-14) is designed to deliver the partial confirmation data (ACD1-ACD3) in the aforesaid second part (37) subsequent to the received data packet (DAT1-DAT3) and prior to the end of the respective time slot (Z1-ZN).

21. The system (1) according to one of claims 14 - 16 or 19 - 20, wherein
 - the communication station (3, 4) is designed to receive and process the confirmation data (ACD; ACD1-ACD3) in a reception time window (SDE; DA) provided for this purpose.
22. The system (1) according to one of claims 13 - 16 and one of claims 17 - 21, wherein
 - the communication station (3, 4) is designed to address a second radio tag (7-14) with the help of the address data (AD) for a time slot (Z1-ZN) provided for executing a multiple time slot command via a first radio tag (7-14), and transmit a single time slot command to the second radio tag (7-14) with the help of the command data (CD).
23. The system (1) according to one of claims 11 - 22, wherein
 - the communication station (3, 4) is designed to use a command for instructing a radio tag (7-14) in the time slot (Z1-ZN) intended for it about another wakeup instant that does not correspond to a time slot (Z1-ZN) usually intended for it, so that the radio tag (7-14) is available in a time slot (Z1-ZN) other than its usual one in the time slot communication process for data transmission with the communication station (3, 4).
24. The system (1) according to one of the preceding claims, wherein

- the radio tag (7-14) is designed to perform multiple checks for a timespan corresponding to the duration of the time slot cycle, in particular extended by a portion of said duration, so as to determine whether a synchronization data signal (SD) can be received, and in the absence of the synchronization data signal (SD), to change the radio channel (18, 19, 20-22) and perform the reception check once more.
25. The system (1) according to one of the preceding claims, wherein
- the radio tag (7-14) is designed to confine a search for a synchronization data signal (SD) to a group of predetermined radio channels (18, 19, 20-22), in particular to those radio channels (18, 19, 20-22) that were transmitted in advance by a communication station (3, 4) when the radio tag (7-14) was connected with this communication station (3, 4).
26. The system (1) according to one of the preceding claims, wherein
- the communication station (3, 4) is designed to check all available radio channels (18, 19, 20-22) during its startup, especially those preprogrammed for its operation, to determine whether the respective radio channel (18, 19, 20-22) is being used by another communication station (3, 4), or whether the respective radio channel (18, 19, 20-22) is not in use, and given such an unused radio channel (18, 19, 20-22), to use

this radio channel (18, 19, 20-22) for communicating with radio tags (7-14) that are or will be assigned to it.

27. The system (1) according to one of the preceding claims, wherein the system (1) comprises a plurality of communication stations (3, 4), and each communication station (3, 4) has assigned to it a group of radio tags (7-10, 11-14) via the selection of the radio channel (18, 19, 20-22) allocated to the communication station (3, 4).
28. The system (1) according to one of the preceding claims, wherein
 - the radio tag (7-14) comprises a display unit (27) for reproducing an image (32), wherein the image (32) is structured in image planes (28, 30), and each image plane (28, 30) is represented by image plane data (ED1, ED2), wherein the radio tag (7-14) is designed to individually receive the image plane data (ED1, ED2) and put together the image (32) by superposing the image planes (28, 30), and wherein
 - the communication station (3, 4) is designed to transmit the respective image plane data (ED1, ED2) during a time slot-overlapping communication with the radio tag (3, 4).
29. The system (1) according to claim 28, wherein
 - the radio tag (3, 4) is designed to change an existing image (32) by

- + receiving at least one single new image plane (28, 30) of the image (32) and
 - + generating the new appearance of the image (32) by replacing an already existing image plane (28, 30) of the image (32) with the image plane (28, 30) just received.
30. The system (1) according to claim 28 or 29, wherein the radio tag (7-14) is designed to process images (32) in which the following meanings are ascribed to the image planes (28, 30):
- first or second frequency (29, 30) of changes in image contents, or
 - first or second color of image contents, or
 - first or second information category of image contents.
31. The system (1) according to one of the preceding claims, wherein the system (1) realizes an electronic price display system, and a display unit (27) of the radio tag (7-14) serves to display product or price information, etc.
32. The system (1) according to one of the preceding claims, wherein the radio tag (7-14) is designed to execute the switch from the sleep state (S) into the active state (E) at a wakeup instant (TA1, TA2) with a lead time (DV) prior to the appearance of the synchronization data signal (SD).

33. The system (1) according to claim 32, wherein the lead time (DV) measures a first fraction of the time slot duration (DS) of a time slot (Z1-ZN).
34. The system (1) according to one of the preceding claims, wherein
- the radio tag (7-14) is designed to assume an active state (E) during a reception duration (DE) that exceeds a transmission duration (DSD) of the synchronization data signal (SD).
35. The system (1) according to one of the preceding claims, wherein
- the radio tag (7-14) is designed to maintain the active state (E) assumed for receiving the synchronization data signal (SD) for a follow-up time (DN) after receiving the synchronization data signal (SD).
36. The system (1) according to claim 35, wherein the follow-up time (DN) measures a second fraction of the time slot duration (DS) of a time slot (Z1-ZN).
37. The system (1) according to one of the preceding claims, wherein
- the communication system (3, 4) is designed to send out the synchronization data signal (SD) at the beginning of the respective time slot (Z1-ZN).
38. The system (1) according to one of the preceding claims, wherein

- the communication station (3, 4) is designed to embed confirmation time data (DR1-DR3) into the synchronization data signal (SD), which can be used to determine a confirmation instant within the time slot (Z1-ZN) at which confirmation data (ACD) are expected from the radio tag (7-14), and
 - the radio tag (7-14) is designed to deliver the confirmation data (ACD) at the specified instant.
39. The system (1) according to one of the preceding claims, comprising a plurality of communication stations (3, 4) and a plurality of radio tags (7-14) and a data processing device (2), which is designed to decide which of the radio tags (7-14) can connect to which communication station (3, 4).
40. The system (1) according to one of the preceding claims, comprising a plurality of communication stations (3, 4) and a plurality of radio tags (7-14) and a data processing device (2), which is designed to prompt a radio tag (7-14) to end an existing connection with one of the communication stations (3, 4) and enter into a connection with another communication station (3, 4).

CLAIMS

1. A system (1), comprising
 - a communication station (3, 4) for communicating with a number of radio tags (7-14) in a time slot communication process, in which a number of time slots (Z1-ZN) per time slot cycle in a repeating sequence are available for communication, and each time slot (Z1-ZN) is characterized by a distinct time slot symbol (ZS1-ZSN), wherein the communication station is designed to send out a synchronization data signal (SD) at the beginning of the respective time slot (Z1-ZN) comprising the time slot symbol (ZS1-ZSN) for the currently present time slot (Z1-ZN), and wherein
 - a radio tag (7-14) is designed:
 - + for changing from a sleep state (S) into an active state (E) at a wakeup instant (TA1), and
 - + for receiving the synchronization data signal (SD) in the active state (E) and,
 - + for determining its synchronism with the communication station solely by virtue of recognizing the time slot symbol (ZS1-ZSN) that appears at the instant it expects or within an expectation time window, and displays the time slot (Z1-ZN) intended for it, and

- + if the received time slot symbol (ZS1-ZSN) indicates a time slot (Z1-ZN) intended for it, for defining a new wakeup instant (TA2) corresponding to the next appearance of the time slot (Z1-ZN) intended for it in a time slot cycle that follows the currently present time slot cycle.
2. The system (1) according to claim 1, wherein the radio tag (7-14), if the received time slot symbol (ZS1-ZSN) indicates a time slot (Z1-ZN) not intended for it, is designed to define a new wakeup instant (TA2) in the currently present time slot cycle that corresponds to the next appearance of the time slot (Z1-ZN) intended for it if the time slot (Z1-ZN) intended for it will still appear in the currently present time slot cycle, or in the time slot cycle that follows the currently present time slot cycle if the time slot (Z1-ZN) intended for it will no longer appear in the currently present time slot cycle.
 3. The system (1) according to one of the preceding claims, wherein the radio tag comprises a memory stage (26) for storing parameters of the time slot communication process, and the radio tag (7-14) is designed to access and consider these parameters for defining the new wakeup instant (TA2).
 4. The system (1) according to one of the preceding claims, wherein the radio tag (7-14) comprises a memory stage (26) for storing a representation of the time slot symbol (ZS1-ZSN) that indicates the time slot (Z1-ZN) intended for it.
 5. The system (1) according to claim 4, wherein the representation of the time slot symbol (ZS1-ZSN)

is realized with a hardware address of the radio tag (7-14) that clearly identifies the radio tag (7-14), and unchangeably programmed into the memory stage (26).

6. The system (1) according to claim 5, wherein aforesaid representation of the time slot symbol is realized by the least significant bit or least significant byte of the hardware address.
7. The system (1) according to one of the preceding claims, wherein the radio tag is designed to check whether a time slot symbol known to it corresponds with one present upon receiving the synchronization data signal.
8. The system (1) according to one of the preceding claims, wherein the communication station is designed for generating the time slot symbol as the consecutive number of the respective time slot corresponding to its appearance in the sequence of time slots in the time slot cycle.
9. The system (1) according to one of the preceding claims, wherein
 - the communication station (3, 4) is designed to embed address data (AD) into the synchronization data signal (SD), which can be used to individually address a number of radio tags (7-14) per time slot (Z1-ZN) intended for aforesaid radio tag (7-14), and
 - the radio tag (7-14), if the received time slot symbol (ZS1-ZSN) indicates a time slot (Z1-ZN) intended for it, is designed to evaluate the synchronization data signal (SD)

for the contained address data (AD), and to check whether it is individually addressed.

10. The system (1) according to claim 9, wherein the communication station (3, 4) is designed to generate the address data (AD) utilizing one or several bits or bytes (B3, B2, B1) of a hardware address of the radio tag (7-14) that distinctly identifies a radio tag (7-14), in particular leaving out the least significant bits or the least significant bytes (B0).
11. The system (1) according to one of the preceding claims, wherein
 - the communication station (3, 4) is designed to embed command data (CD) into the synchronization data signal (SD), with which a command can be transmitted to a radio tag (7-14) in a time slot (Z1-ZN) intended for aforesaid radio tag (7-14), and
 - the radio tag (7-15), if the received time slot symbol (ZS1-ZSN) indicates a time slot (Z1-ZN) intended for it, is designed to evaluate the synchronization data signal (SD) for the contained command data (CD) and execute the command.
12. The system (1) according to claim 11, when dependent on claim 9 or 10, wherein the radio tag (7-14) is designed to evaluate the command data (CD) and execute the command when individually addressed with the help of the address data (AD).
13. The system (1) according to claim 11 or 12, wherein

- the radio tag (7-14) is designed to execute a command as a single time slot command, and conclude the executed command within a single time slot (Z1-ZN) in which the command was received.

14. The system (1) according to claim 13, wherein

- the radio tag (7-14), during completion of the executed command, is designed to generate confirmation data (ACD) and deliver the confirmation data (ACD) in the time slot (Z1-ZN) in which the command was received.

15. The system (1) according to claim 14, wherein

- the radio tag (7-14) for delivering the confirmation data (ACD) is formed in a first part (36) of the time slot (Z1-ZN), which is chronologically localized after the synchronization data signal (SD), and leaves an ensuing second part (37) of the time slot (Z1-ZN) untouched prior to the appearance of the synchronization data signal (SD) of the following time slot (Z1-ZN).