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TE-LW-A
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Description of Protocol - Checkout-Dialog 06

RECORD   CASH REGISTER TERMINAL (POS) → SCALE

- ### Record No. 01: transmission of unit price

```
EOT  STX  0  1  ESC  D5  D4  D3  D2  D1  DO  ESC  ETX
          \  /       _____/
          Record            Unit price
            No.            5/6 digits
```

- ### Record No. 03: transmission of unit price and a tare value

```
EOT  STX  0  3 ESC  D5  D4  D3  D2  D1  DO  ESC  T3  T2  T1  T0  ETX
          \  /       _____/        _____/
          Record            Unit price               Tare value
            No.            5/6 digits                 4 digits
```

- ### Record No. 04: transmission of unit price and text

```
EOT  STX  0  4  ESC  D5  D4  D3  D2  D1  DO  ESC  A ..... A  ETX
          \  /       _____/        _____/
          Record            Unit price            Text (ASCII)
            No.            5/6 digits              13 digits
```

- ### Record No. 05: transmission of unit price tare value and text

```
EOT  STX  0  5  ESC  D5  D4  D3  D2  D1  DO  ESC  T3  T2  T1  T0  ESC  A ..... A  ETX
          \  /       _____/        _____/       _____/
          Record            Unit price               Tare value         Text (ASCII)
            No.            5/6 digits                 4 digits           13 digits
```

RECORD   CASH REGISTER TERMINAL (POS) → SCALE

- **Record No. 08: request for status information after receipt of NAK (response = record 09)**

```
EOT  STX  0  8  ETX
           \    /
          Record No.
```

- **ENQ: Request for scale data (response = record 02)
  Request for record 11 (check OK/check not OK)**

```
EOT  ENQ
```

- **Standardizing of scale: the scale interface is set to its basic
             state. 'EOT' must be prefixed to each
             request**

```
EOT
```

RECORDS   SCALE → CASH REGISTER TERMINAL (POS)

- **Record No. 02: valid weight value**

```
STX 0 2 ESC X ESC D4 D3 D2 D1 DO ESC D5 D4 D3 D2 D1 D0 ESC D5 D4 D3 D2 D1 D0 ETX
   \  /   |     _____/        _____/       _____/
 Record Scale      Weight                 Unit price              Selling price
   No.   status    5 digits               5/6 digits                6 digits
```

```
Scale status X

30H = lb : oz / 1/8 oz
31H = lb / 0,01
32H = lb / 0,005
33H = kg
```

RECORD   CASH REGISTER TERMINAL (POS) → SCALE

Transmitting checksums + correction value to the scale

```
EOT  STX  10  ESC  CS1  KW1  CS2  KW2  ..  CSn  KWn  ETX
         \ / |   \     /
           Record |    \  /_____      CS1  KW1 (checksum, correct. value) 1
              No.  |                    CS2  KW2 (checksum, correct. value) 2
                   |                     CSn  KWn (checksum, correct. value) n
               Separator
```

- The checksum and the correction value are represented in hexadecimal
  ACSII format (whereby 'n' may be max. 5)

  Example: CS1 = 74AEH, which results in 37H, 34H, 41H, 45H

RECORDS   SCALE → CASH REGISTER TERMINAL (POS)

Response or request for the checksum:

```
STX  11  ESC  D0   Z  ETX
   \ / |    \   \___ Random number only if D0  =  32H
  Record |     \
    No.  |      \_____  30H = check not in order
         |              31H = check in order
         |              32H retransmit record 10 by using the random
         |                  number 'Z'
       Separator
```

Representation of random number 'Z' identical to the checksum and the correction
value.

RECORD   CASH REGISTER TERMINAL (POS) → SCALE

logic version number ON/OFF

```
EOT  STX  20  ESC  D0  ETX
         \ / |   \
           Record |    \___  30H = logic version number OFF
              No.  |         31H = logic version number ON
                   |
               Separator
```

RECORDS   SCALE   →   CASH REGISTER TERMINAL (POS)

- **ACK: positive acknowledgement**

- **NAK: negative acknowledgement**

```
a) if error on scale
b) if parity error on interface has been detected
c) if incorrect record number has been detected
d) if no valid unit price has been received
e) if no valid tare value has been received
f) If no valid text has been received
g) if more than 50 characters have been received
h) if scale is still in motion
i) if there was no more motion after the last weighing operation
j) if the scale is below MIN
k) if the scale is in the underload range
l) if the scale is in the overload range
```

- **Record No. 09: status information after 'NAK'**

```
STX  0  9  ESC  S1  S0  ETX
                 \  /
                Status


S1  S0

 0    0         ; there is no error present
 0    1         ; GENERAL error on scale
 0    2         ; PARITY error, or more characters than permitted
 1    0         ; incorrect record number detected
 1    1         ; no valid unit price
 1    2         ; no valid tare value received
 1    3         ; no valid text received
 2    0         ; scale still in motion (no equilibrium)
 2    1         ; no motion since last weighing operation
 2    2         ; price calculation not yet available
 3    0         ; scale in MIN range
 3    1         ; scale in underload range or negative weight display
 3    2         ; scale in overload range
```

- **No response**

```
a) if ETX was not detected (on receipt of unit price)
b) if STX was not detected (on receipt of unit price)
c) if ENQ was not detected (on call of scale data)
```

Dialog scheme

```
    /----------------------------------------- < --------------------\
    |                                                                |
    |                            /---------------------\             |
    |                           /|STX|Record 11 (32H,Z)|ETX|-\        |
    |                           | \---------------------/ | |        |
    |                           |                         | |        |
    |                           |        /-----\          | |        |
    |                           /--------| NAK |--------------/       |
    |                           |        \-----/          | |        |
    |   |-----|    |-------------------|  |       /-----\  | |        |
>-\-- | EOT |-\-- | STX |Record 01| ETX|--//------| ACK |--------------/-/
    |  |-----| |  | |-------------------|  |       \-----/           |
    |          |  |                                                  |
    |          |  |-------------------|  |                           |
    |          \--| STX |Record 03| ETX |--/                         |
    |          |  |-------------------|  |                           |
    |          |                                                     |
    |          |  |-------------------|  |                           |
    |          \--| STX |Record 04| ETX |--/                         |
    |          |  |-------------------|  |                           |
    |          |                                                     |
    |          |  |-------------------|  |                           |
    |          \--| STX |Record 05| ETX |--/                         |
    |          |  |-------------------|  |                        ^  |
    |          |                                                     |
    |          |  |-------------------|  |                           |
    |          \--| STX |Record 10| ETX |--/                         |
    |          |  |-------------------|  |                           |
    |          |                                                     |
    |          |  |-------------------|  |                           |
    |          \--| STX |Record 20| ETX |--/                         |
    |          |  |-------------------|                              |
    |          |                                                     |
    |          |  |-----|                    /-------------------\   |
    |          \--| ENQ |-------------------\---| STX |Record 02| ETX |-----/
    |             |-----|                   |   \-------------------/ |
    |                                       |                        |
    |                                       |   /-------------------\ |
    |                                       \---| STX |Record 11| ETX |-----/
    |                                       |   \-------------------/ |
    |                                       |                        |
    |                                       |   /-----\              |
    |                                       \---| NAK |-------------------/
    |                                           \-----/              |
    |          |-------------------|            /-------------------\ |
    |          \--| STX |Record 08| ETX |--\---| STX |Record 09| ETX |-----/
    |             |-------------------|      |   \-------------------/ |
|-----|                                     |                        |
|     |  POS (cash register terminal)       \---| STX |Record 11| ETX |-----/
|-----|                                     |   \-------------------/ |
                                            |                        |
/-----\                                     |   /-----\              |
|     |  Scale                              \---| NAK |--------------------/
\-----/                                         \-----/
```
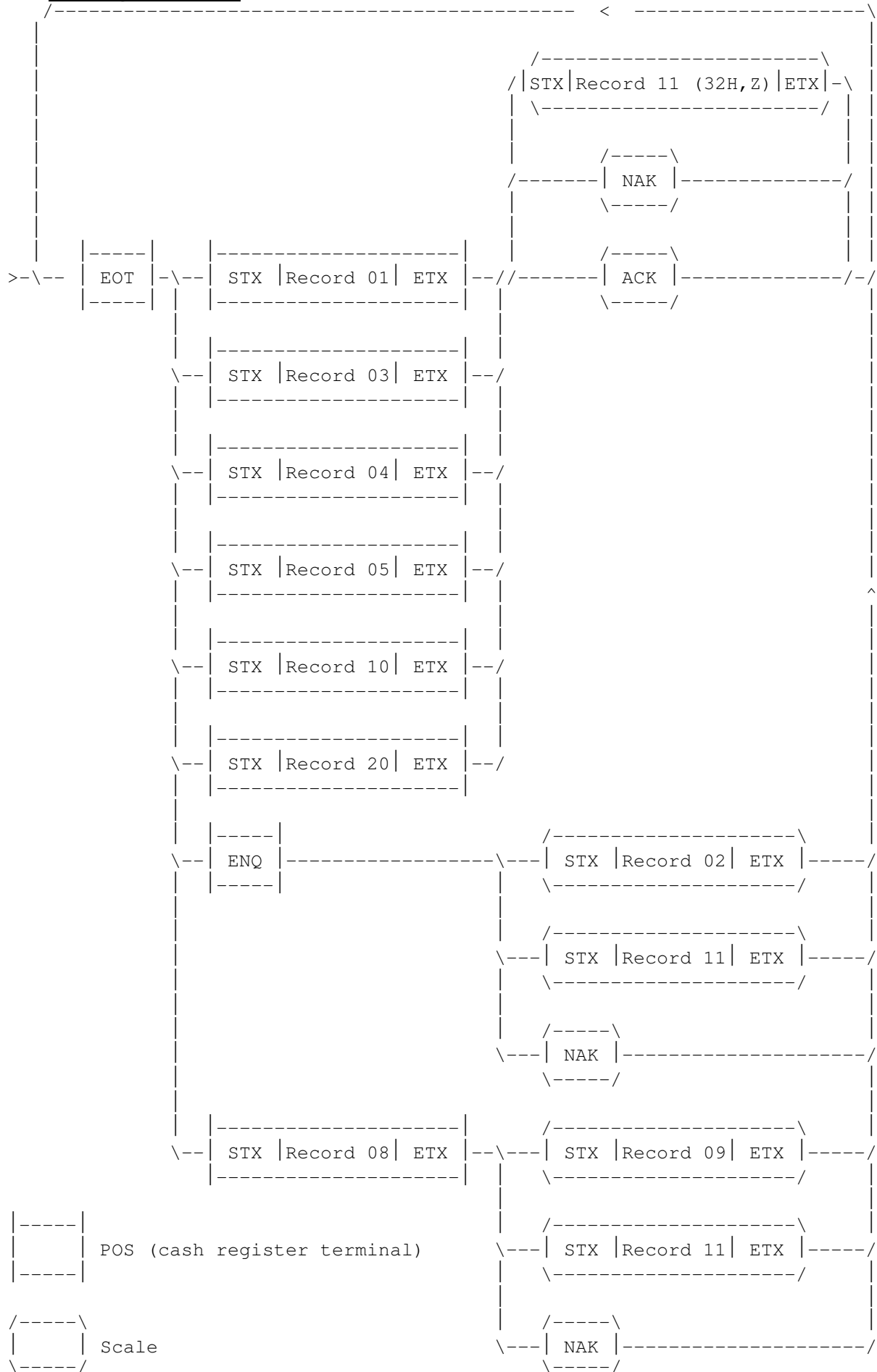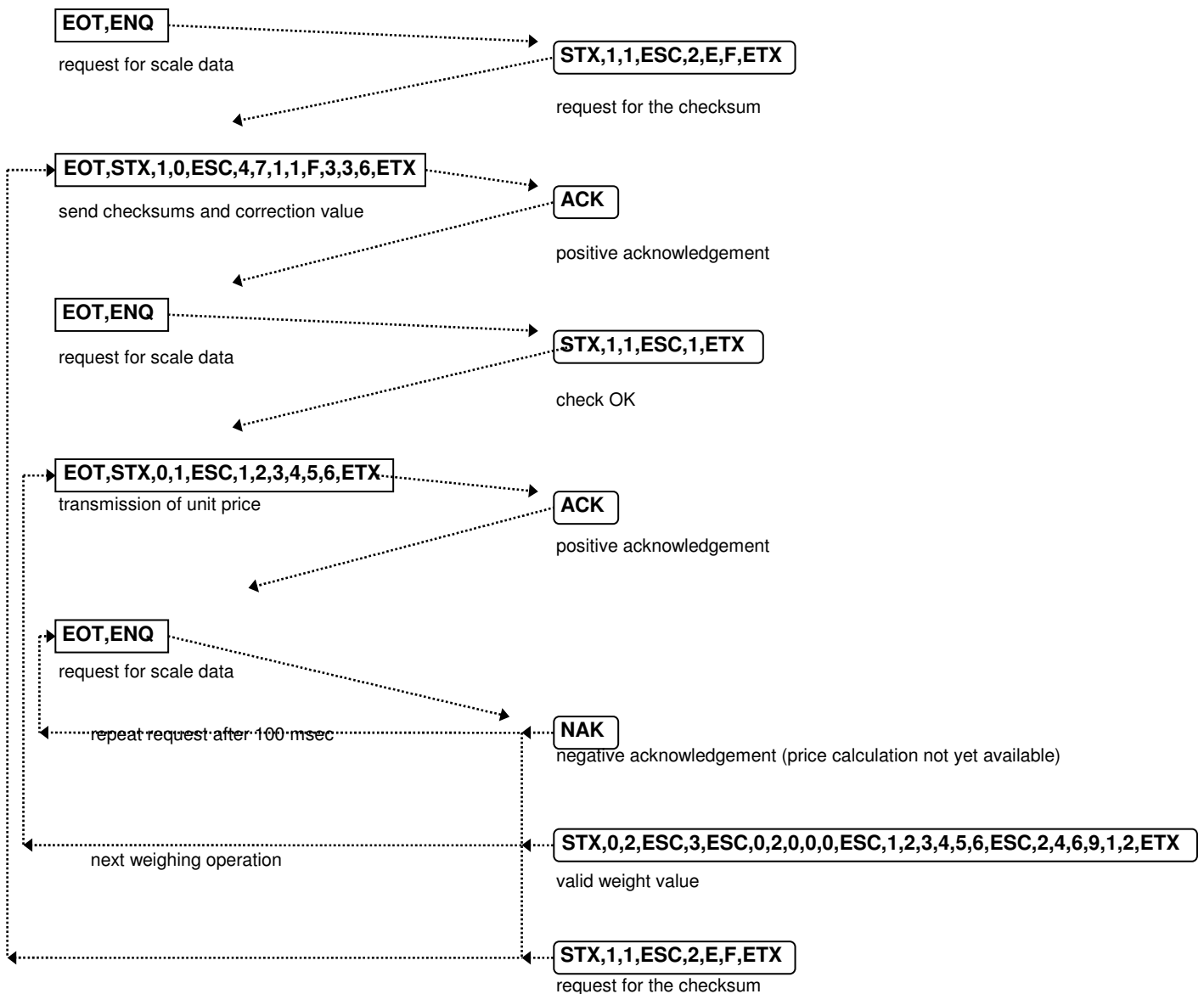
Example for Dialog

C A S H R E G I S T E R: **S C A L E:**
_____   _____

| EOT,ENQ |
request for scale data

| STX,1,1,ESC,2,E,F,ETX |
request for the checksum

| EOT,STX,1,0,ESC,4,7,1,1,F,3,3,6,ETX |
send checksums and correction value

| ACK |
positive acknowledgement

| EOT,ENQ |
request for scale data

| .STX,1,1,ESC,1,ETX |
check OK

| EOT,STX,0,1,ESC,1,2,3,4,5,6,ETX |
transmission of unit price

| ACK |
positive acknowledgement

| EOT,ENQ |
request for scale data

repeat request after 100 msec

| NAK |
negative acknowledgement (price calculation not yet available)

next weighing operation

| STX,0,2,ESC,3,ESC,0,2,0,0,0,ESC,1,2,3,4,5,6,ESC,2,4,6,9,1,2,ETX |
valid weight value

| STX,1,1,ESC,2,E,F,ETX |
request for the checksum

This is only one example for dialog between cash register and scale !!

DATA FORMAT AND TRANSMISSION SPEED

```
Transmission speed:              9600 baud

Mode of transmission:            asynchronous

Data format:                     7 bits + parity

Parity:                          odd

Stop bit:                        1 bit
```

–   The data output on the scale may be an RS 232, RS 422 or a
    TTY 20 mA interface.
    In the data cable, only the send and receive lines or GND are
    wired. There are no further control cables supported.

    Bizerba offers various data cables with different plugs to POS.
    The type of cables and plugs must be clarified prior to placement
    of order.

NOTES CONCERNING THE FUNCTION

- The 06 checkout dialog represents an extension of the checkout
  dialog 02. The records 10, 11 and 20 are new.

- After startup, the scale will be in its normal weighing mode.

- The scale requests the record 10 from POS by means of record 11
  (32H, Z). After a relevant check, the request is acknowledged
  with record 11 (check OK/check not OK).

Check not OK

If POS transmits a unit price and the checksum check has not been
carried out, the scale will respond by transmitting record 11
(32H, Z). In this case, the unit price will not be indicated
(audible error signal).

Record 11 (32H, Z) is normally transmitted after

– scale ON/OFF
– scale error
– protocol error
– interface error
– after 50 weighing operations of the scale in conjunction with
the
  cash register (cyclic test of POS)
– display of logic version number

Check OK

After the checksum check has taken place, the scale waits for the
transmission of ENQ or a unit price from the interface. At this
time, it ranges in the 'Cash register' mode for which reason the
keyboard is inactive. This means also that operations can now
only be carried out via the interface.