

## Description of CAT 17 scales communication

### Communication protocols

#### Notes to all protocols

1. Decimal point PD can have the value "." (2CH) or "," (2EH) or "ASCII" and it means:
  - "." (2CH) or "," (2EH) – PD appears on the proper position between digits in a mass value
  - "ASCII" – PD appears after the last digit of a mass value and its description in ASCII shows quantity of digits after decimal point.
2. Negative mass is indicated (or not) in different ways depending on particular protocol. The ways of indication are given at protocol descriptions. Protocols No.: 5, 6, 9 and A do not obtain information about negative mass value so the configuration of scales should make not possible to send negative measuring results (default settings).
3. Digits appearing in front of the first meaning digit in a mass value are recorded as spaces (20H). Always in front of a decimal point (PD) there is placed at least one meaning digit (it can be also zero).
4. First 5 protocols from No. 0 to No. 4 refers to the specific communication of detail listed cash registers. Others are the general type protocols and they are detail described.  
Referring to CAT 7 Medesa protocols shows the compatibility with previous version of CAT 7 scales.  
For example: description "Protocol 5 – "COMPU S100" protocol of Medesa CAT 7" shows that the protocol 5 is equivalent to the protocol "COMPU S100" in CAT 7 scales.
5. In all described protocols if the transmitted response obtains unstable result of measuring then are sent "spaces" instead of all meaning digits and decimal point PD described in the point 1.
6. The scales is transmitting result:
  - after pressing [→] button on the scales
  - after enquiry done by serial interface (depending on protocol)
  - if it is so set it can send the result once after stable measurement or in continuous way.
7. There is a list of scales settings related to the way of transmitting the result. Among other there can be set following parameters:
  - ones concerning transmission parameters
  - minimal value of the result to be considered as stabile (from 0 to 50\*e divisions)
  - result automatic transmission (no automatic, one transmission after stabilising, continuous transmission)
  - if negative result should be transmitted
  - if should be transmitted response frame when the result is unstable after timeout
  - stable response transmission timeout (0 to 14 seconds)
  - blocking transmission of the result when it should be sent by pressing the button on scales
  - if the sound signal should be generated after transmitting the result.

#### Protocol 0 – ELZAB basic protocol

Code	Hex	Description	Direction
SIGN	20H or 2DH	"space" – mass value more than zero "-" – mass value less than zero	Scales → PC
SPACE	20H	"space"	Scales → PC
D5	ASCII	Mass 0...9 (MSB)	Scales → PC
D4	ASCII	Mass 0...9	Scales → PC
PD	2EH	Decimal point	Scales → PC

D3	ASCII	Mass 0...9	Scales → PC
D2	ASCII	Mass 0...9	Scales → PC
D1	ASCII	Mass 0...9 (LSD)	Scales → PC
CR	0DH	Carriage return	Scales → PC
LF	0AH	Line feed	Scales → PC

Note: Specific protocol to serve ELZAB Mini, ELZAB Jota, ELZAB Alfa, ELZAB Delta cash registers and ELZAB Eta label printer.

In protocols 0 and 1 it can be sent enquiry to scales by the interface. Here are given all possible formats of enquiries:

Sequence					Description	Direction
ESC	4DH	03	61H	LF	Enquiry about result with counting timeout	PC → Scales
ESC	4DH	03	62H	LF	Enquiry about result with immediate response	PC → Scales
ESC	4DH	03	63H	LF	Cancellation of waiting for result	PC → Scales
ESC	4DH	03	66H	LF	Send scales type byte (checking if scales is connected)	PC → Scales
ESC	4DH	03	71H	LF	Enquiry about result with counting timeout with setting on protocol 0	PC → Scales
ESC	4DH	03	72H	LF	Enquiry about result with immediate response with setting on protocol 0	PC → Scales
ESC	4DH	03	81H	LF	Enquiry about result with counting timeout with setting on protocol 1	PC → Scales
ESC	4DH	03	82H	LF	Enquiry about result with immediate response with setting on protocol 1	PC → Scales

#### Protocol 1 – ELZAB extended protocol

Code	Hex	Description	Direction
ESC	1BH	“escape”	Scales → PC
STAB	ASCII	“S” – when the result stable	Scales → PC
	ASCII	“U” – when the result not stable	Scales → PC
SIGN	20H or 2DH	“space” – mass value more than zero “-” – mass value less than zero	Scales → PC
D5	ASCII	Mass 0...9 (MSB)	Scales → PC
D4	ASCII	Mass 0...9	Scales → PC
PD	2EH	Decimal point	Scales → PC
D3	ASCII	Mass 0...9	Scales → PC
D2	ASCII	Mass 0...9	Scales → PC
D1	ASCII	Mass 0...9 (LSD)	Scales → PC
CR	0DH	Carriage return	Scales → PC
LF	0AH	Line feed	Scales → PC

Note: Specific protocol to serve MICRA Eco, ELZAB Mini, ELZAB Jota, ELZAB Alfa, ELZAB Delta cash registers and ELZAB Eta label printer.

#### Protocol 2 – “ECR2 “ protocol of Medesa CAT 7

Enquiry about the result:

Code	Hex	Description	Direction
D	44H	“D”	PC → Scales
CR	0DH	Carriage return	PC → Scales
LF	0AH	Line feed	PC → Scales

Response:

Code	Hex	Description	Direction
SIGN	2BH or 2DH	“+” – mass value more than zero “-” – mass value less than zero	Scales → PC
SPACE	20H	“space”	Scales → PC

D5	ASCII	Mass 0...9 (MSB)	Scales → PC
D4	ASCII	Mass 0...9	Scales → PC
PD	2EH	Decimal point	Scales → PC
D3	ASCII	Mass 0...9	Scales → PC
D2	ASCII	Mass 0...9	Scales → PC
D1	ASCII	Mass 0...9 (LSD)	Scales → PC
CR	0DH	Carriage return	Scales → PC
LF	0AH	Line feed	Scales → PC

Note: Specific protocol to serve ELZAB System 600 and ELZAB Alfa cash registers.

### Protocol 3 – “ECR4” protocol of Medesa CAT 7

Enquiry about the result:

Code	Hex	Description	Direction
CR	0DH	Carriage return	PC → Scales

Response:

Code	Hex	Description	Direction
SIGN	2BH or 2DH	“+” – mass value more than zero “-” – mass value less than zero	Scales → PC
SPACE	20H	“space”	Scales → PC
D5	ASCII	Mass 0...9 (MSB)	Scales → PC
D4	ASCII	Mass 0...9	Scales → PC
PD	2EH	Decimal point	Scales → PC
D3	ASCII	Mass 0...9	Scales → PC
D2	ASCII	Mass 0...9	Scales → PC
D1	ASCII	Mass 0...9 (LSD)	Scales → PC
CR	0DH	Carriage return	Scales → PC
LF	0AH	Line feed	Scales → PC

Note: Specific protocol to serve DSA 100, DSA 4000, IES Electronics 2123, 2223, 2133, 2233 (Aster), Siemens Beetle 50, 60 (with Europos software) cash registers.

### Protocol 4 – “ECR7” protocol of Medesa CAT 7

Enquiry about presence of scales:

Code	Hex	Description	Direction
ENQ	05H		PC → Scales

Response:

Code	Hex	Description	Direction
ACK	06H		Scales → PC

Enquiry about the result:

Code	Hex	Description	Direction
DC1	11H		PC → Scales

Response:

Code	Hex	Description	Direction
SOH	01		Scales → PC
STX	02		Scales → PC
STAB	ASCII ASCII	“S” – when the result stable “U” – when the result not stable	Scales → PC
SIGN	20H or 2DH	“space” – mass value more than zero “-” – mass value less than zero	Scales → PC
D5	ASCII	Mass 0...9 (MSB)	Scales → PC
D4	ASCII	Mass 0...9	Scales → PC

PD	2EH	Decimal point	Scales → PC
D3	ASCII	Mass 0...9	Scales → PC
D2	ASCII	Mass 0...9	Scales → PC
D1	ASCII	Mass 0...9 (LSD)	Scales → PC
k	ASCII	"k"	Scales → PC
g	ASCII	"g"	Scales → PC
SUM	xx	Check sum (algorithm specific for these cash registers)	Scales → PC
ETX	03H	Carriage return	Scales → PC
EOT	04H	Line feed	Scales → PC

Note: Specific protocol to serve Posnet ECR, Sharp 445, 455, Euro 2000, Camea CCS 10, Optimus CR280, PS2000 PLUS, MAŁA, TANGO, MINI, Samsung ER-5140F, Sanyo ECR400, 410, 425 and 445 cash registers.

#### Protocol 5 – "COMPU S100" protocol of Medesa CAT 7

Code	Hex	Description	Direction
ENQ	05H	Enquiry	Scales → PC
ACK	06H	Acknowledge	PC → Scales
STX	02H	Start of text	Scales → PC
D1	ASCII	Mass 0...9 (LSD)	Scales → PC
D2	ASCII	Mass 0...9	Scales → PC
D3	ASCII	Mass 0...9	Scales → PC
D4	ASCII	Mass 0...9	Scales → PC
D5	ASCII	Mass 0...9	Scales → PC
D6	ASCII	Mass 0...9 (MSD)	Scales → PC
PD	ASCII	Quantity of decimal positions (0...3)	Scales → PC
ETX	03H	End of text	Scales → PC
ACK	06H	Acknowledge	PC → Scales

Note: The protocol is used only for mass value transmission by pressing the button [→] and after stabilising of the measured value in automatic way. In case of continue transmission of mass value it is used protocol 6.

#### Protocol 6 - "COMPU S100A" protocol of Medesa CAT 7

Code	Hex	Description	Direction
STX	02H	Start of text	Scales → PC
D1	ASCII	Mass 0...9 (LSD)	Scales → PC
D2	ASCII	Mass 0...9	Scales → PC
D3	ASCII	Mass 0...9	Scales → PC
D4	ASCII	Mass 0...9	Scales → PC
D5	ASCII	Mass 0...9	Scales → PC
D6	ASCII	Mass 0...9 (MSD)	Scales → PC
PD	ASCII	Quantity of decimal positions (0...3)	Scales → PC
ETX	03H	End of text	Scales → PC

#### Protocol 7 – "POS" protocol of Medesa CAT 7

Code	Hex	Description	Direction
SIGN	20H or 2DH	"space" – mass value more than zero "-" – mass value less than zero	Scales → PC
D5	ASCII	Mass 0...9	Scales → PC
D4	ASCII	Mass 0...9	Scales → PC
PD	2EH	Decimal point	Scales → PC
D3	ASCII	Mass 0...9	Scales → PC
D2	ASCII	Mass 0...9	Scales → PC
D1	ASCII	Mass 0...9 (LSD)	Scales → PC
CR	0DH	Carriage return	Scales → PC

LF	0AH	Line feed	Scales → PC
----	-----	-----------	-------------

**Protocol 8 – “COMP1” protocol of Medesa CAT 7**

Code	Hex	Description	Direction
SIGN	2DH	“-“ – mass value less than zero if the mass value is more than zero this byte is not transmitted	Scales → PC
D5	ASCII	Mass 0...9 (MSD)	Scales → PC
D4	ASCII	Mass 0...9	Scales → PC
PD	2EH	Decimal point	Scales → PC
D3	ASCII	Mass 0...9	Scales → PC
D2	ASCII	Mass 0...9	Scales → PC
D1	ASCII	Mass 0...9 (LSD)	Scales → PC
CR	0DH	Carriage return	Scales → PC
LF	0AH	Line feed	Scales → PC

**Protocol 9 – “PARCON” protocol of Medesa CAT 7**

Code	Hex	Description	Direction
ENQ	05H	Enquiry	Scales → PC
ACK	06H	Acknowledge	PC → Scales
STX	02H	Start of text	Scales → PC
D5	ASCII	Mass 0...9 (MSD)	Scales → PC
D4	ASCII	Mass 0...9	Scales → PC
PD	2EH	Decimal point	Scales → PC
D3	ASCII	Mass 0...9	Scales → PC
D2	ASCII	Mass 0...9	Scales → PC
D1	ASCII	Mass 0...9 (LSD)	Scales → PC
ETX	03H	End of text	Scales → PC
ACK	06H	Acknowledge	PC → Scales

**Protocol A – “Response to ENQ S100” protocol of Medesa CAT 7**

Code	Hex	Description	Direction
ENQ	05H	Enquiry	PC → Scales
STX	02H	Start of text	Scales → PC
D1	ASCII	Mass 0...9 (LSD)	Scales → PC
D2	ASCII	Mass 0...9	Scales → PC
D3	ASCII	Mass 0...9	Scales → PC
D4	ASCII	Mass 0...9	Scales → PC
D5	ASCII	Mass 0...9	Scales → PC
D6	ASCII	Mass 0...9 (MSD)	Scales → PC
PD	ASCII	Quantity of decimal positions (0...3)	Scales → PC
ZERO	30H or 65H	30H – mass value equal zero 65H – mass value more than zero	Scales → PC
ETX	03H	End of text	Scales → PC

**Protocol B – “Response to ENQ S100A” protocol of Medesa CAT 7**

Code	Hex	Description	Direction
ENQ	05H	Enquiry	PC → Scales
STX	02H	Start of text	Scales → PC
D1	ASCII	Mass 0...9 (LSD)	Scales → PC
D2	ASCII	Mass 0...9	Scales → PC
D3	ASCII	Mass 0...9	Scales → PC
D4	ASCII	Mass 0...9	Scales → PC

D5	ASCII	Mass 0...9	Scales → PC
D6	ASCII	Mass 0...9 (MSD)	Scales → PC
PD	ASCII	Quantity of decimal positions (0...3)	Scales → PC
LEDS	BIN	LED indicators of scales	Scales → PC
ETX	03H	End of text	Scales → PC

LEDS is the binary digit in form of:

0 0 1 a b c d e

where letters are representing following scales LED indicators:

a – minus sign

b – fixed tara

c – netto

d – not used (“0” value always)

e – zero.

The positions of the letters should be replaced by “0” if this indicator is switched off and “1” if the indicator is switched on.