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LMS/TiM CoLa Data Format

Communications Language - CoLa

March 2016

LMS / TiM : CoLa ASCII Protocol

CoLa ASCII Protocol

The ASCII telegram is an additional format and because of the ASCII messages are a little better to understand.
The framing of the telegram is a STX at the start and an ETX at the end of each telegram.
The command is written in ASCII letters, followed by the parameters like defined in that document. Parameters could be transferred in hex or decimal format, but in decimal format they need a sign (for example: scan frequency 25Hz: 09C4h/+2500d)
Attention: Leading zeros of each parameter and value were deleted, so the byte length of a parameter may not fit to what is standing in that document. That also causes different string length in the scan data telegram.

LMS / TiM : Data Record – 5 echo mode

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Example of the data string

This Example is done with a LMS5xx, because can be configured to be the longest telegram of the LMS scanner family due to five echo pulses.
The LMS1xx and our TiM just have less measurement data (only two or one echo pulses DIST1 or DIST1+2), all the rest is the same.

sRN LMDscandatasRA LMDscandata 0 1 9E14CE 0 0 ECF8 ED6E C267B795 C268A7A8 0 0 3F0
0 9C4 21C 1 3AD 0 5 **DIST1** *3F800000 00000000 DBBA0 683 1F* 0 0 0 0 890B 8927 8945
8922 892F 8936 8975 0 0 0 0 0 8A4A 8A54 8A7D 0 0 8456 848E 84AF 8506 8560 85E9 8697
86DE 7E16 7DF5 **DIST2** *3F800000 00000000 DBBA0 683 1F* 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 8720 874D **DIST3** *3F800000 00000000 DBBA0 683 1F* 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 **DIST4** *3F800000 00000000 DBBA0 683*
1F 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 **DIST5** *3F800000 00000000*
DBBA0 683 1F 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 5 **RSSI1**
3F800000 00000000 DBBA0 683 1F 0 0 0 0 D 19 26 23 29 21 15 0 0 0 0 0 10 12 7 0 0 15
2E 36 38 37 33 33 29 14 28 **RSSI2** *3F800000 00000000 DBBA0 683 1F* 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1E 14 **RSSI3** *3F800000 00000000 DBBA0 683 1F* 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 **RSSI4** *3F800000 00000000 DBBA0*
683 1F 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 **RSSI5** *3F800000*
00000000 DBBA0 683 1F 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 10
not defined 0 1 7B2 1 F F 27 1F D59F8 0

Key of individual segments (in HEX):

Black:	**Request**
Dark grey:	**Front Header**
Yellow:	**Measurement and RSSI Values from Echo 1**
Green:	**Measurement and RSSI Values from Echo 2**
Turquoise:	**Measurement and RSSI Values from Echo 3**
Red:	**Measurement and RSSI Values from Echo 4**
Pink:	**Measurement and RSSI Values from Echo 5**
Light grey:	**End Header**

LMS / TiM : Front Header Definition

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Front Header Definitions

```
sRA LMDscandata 0 1 9E14CE 0 0 ECF8 ED6E C267B795 C268A7A8 0 0 3F 0
0 9C4 21C 1 3AD 0 5
```

sRA LMDscandata 0 = Command Response - (Polling one Telegram)

1	**= Device Number**
9E14CE	**= Serial Number (=1036 0014)**
0 0	**= Device Status (The value "Device Status" in the scan telegram exists of two 8-bit values.**

So it is not one 16-bit value, but two 8-bit values.
Also it is Low byte first, so the sequence is LSB, MSB.)

ECF8	**= Telegram Counter**
ED6E	**= Scan Counter**
C267B795	**= Time since Start up in µsec**
C268A7A8	**= Time of transmission in µsec**
0 0	**= Status of the digital inputs (two 8-bit values)**
3F0	**= Status of the digital outputs (3Fh = 111111b = all outputs high)**
0	**= Reserved**
9C4	**= Scan frequency (9C4h = 2500d = 25Hz)**
21C	**= Measurement frequency**
1	**= Amount of encoder data**
3AD	**= Encoder Position**
0	**= Encoder Speed**
5	**= Amount of 16bit Channels (means how many echoes are evaluated)**

LMS / TiM : Distance and RSSI Definitions

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Measurement Values (example: Echo 1)

DIST1 *3F800000 00000000 DBBA0 683 1F* 0 0 0 0 890B 8927 8945 8922 892F 8936 8975
0 0 0 0 0 8A4A 8A54 8A7D 0 0 8456 848E 84AF 8506 8560 85E9 8697 86DE 7E16 7DF5

DIST1	=	now coming the radial distance values of the first pulse
3F800000	=	Scale Factor (3F800000 = factor 1; 40000000 = factor 2)
00000000	=	Scale Factor Offset
DBBA0	=	Start angle (DBBA0h = 900.000d = 90°)
683	=	Angular resolution (683h = 1.667d = 0,1667°)
1F	=	Amount of Data (1Fh = 31d = 31 measurement values are following)

0 0 0 0 890B 892..... = measurement values in HEX (example: 890Bh = 35.083 = 35083mm = 35,083m)

This format is the same for every other DIST string

RSSI Values (Example: Echo 1)

RSSI1 *3F800000 00000000 DBBA0 683 1F* 0 0 0 0 D 19 26 23 29 21 15 0 0 0 0 0 10 12 7
0 0 15 2E 36 38 37 33 33 29 14 28

3F800000	**=**	**Scale Factor (3F800000 = factor 1; 40000000 = factor 2)**
00000000	**=**	**Scale Factor Offset**
DBBA0	**=**	**Start angle (DBBA0h = 900.000d = 90°)**
683	**=**	**Angular resolution (683h = 1.667d = 0,1667°)**
1F	**=**	**Amount of Data (1Fh = 31d = 31 measurement values are following)**
0 0 0 0 D 19 26....	**=**	**RSSI Values**

This format is the same for every other RSSI String.

LMS / TiM : End Header Definition

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End Header

```
0 1 10 not defined 0 1 7B2 1 F F 27 1F D59F8 0
```

0	**=**	**Position data (0 = no position data)**
1	**=**	**Name (1 = Name available)**
10	**=**	**Length of the name**
not defined	**=**	**Name**
0	**=**	**Comment (0 = no Command)**
1	**=**	**Time**
7B2	**=**	**Year**
1	**=**	**Month**
F	**=**	**Day**
F	**=**	**Hours**
27	**=**	**Minutes**
1F	**=**	**Seconds**
D59F8	**=**	**µsec**
0	**=**	**Event INfo (0 = no event info)**

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- Thank you for your attention.