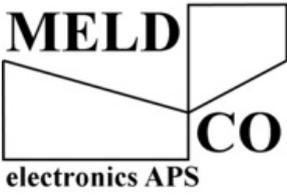


Title:	Nurse call Protocol structure 172-140330.doc	
Author:	ELD	
First Version:	172-140324	
Updated:	172-180911	

(Additionally to this document, there are the bootloader protocol, there are used for downloading software and changing the nodes settings. it uses the older rev 2.0 A can structure 11bit id.)

1. Application Layer
2. Wrapping ISO-15765-2
3. CAN Library , MOB control
4. CAN low level packet 29 bits of Identifier (rev 2.0 B)
5. Physical Layer Bus 50kb 1000m ISO11898 (TI SLLA270)

1. Application Layer

One Packet on the bus consist of
 stype + nc_call_t(type,group,id,subid,prio,text)

```

U8 stype
00H=Sync
01H=ADD (type,group,id,subid,prio,text)
02H=Remove (type,group,id,subid)
50H=Status (value) // voltage=((5.2/1024)*((value*2)+200))*11

typedef struct{
  U8 type;
  U8 group;
  U8 id;
  U8 subid;
  U8 prio;
  U8 text[14];
  U8 flags; //Must be in the end because it's not sent out on the can-bus
} nc_call_t;

U8 type
1=Call
2=Presence
255=Not Def.

U8 group, U8 id, U8 subid,
0-254, 255=Not Def.

U8 prio
0="No Sound"
1="Call No Speech"
2="Speech/Staff/Lift/Dore"
3="WC"
4="Phone/Assistance"
5="Emergency"
6="Diagnostic"
7="ID/Assault/Fire"
255=Not Def.

U8 text[14]
"Hello World " //14 chars in ISO8859-1 For more info read: http://da.wikipedia.org/wiki/ISO\_8859-1

```

Example, of adding a call

```

st ,t ,g ,id ,si ,pwc,text "Hello World "
01H,01H,01H,01H,01H,03H,48H,65H,6CH,6CH,6FH,20H,20H,57H,6FH,72H,6CH,64H,20H,20H

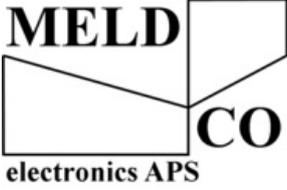
```

Example, of removeng a call

```

st ,t ,g ,id ,si
02H,01H,01H,01H,01H

```

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2. Wrapping ISO-15765-2

The smart thing about can-bus is, that the low level packets is a open standard so everyone can read the communication, the packets can max contain 8 data bytes, this gives a problem, when you want to send more then 8 bytes, to solve this I have used the ISO-15765-2

For more info read: https://en.wikipedia.org/wiki/ISO_15765-2

Example, of adding a call

```
St ,t ,g ,id ,si ,pwc ,text "Hello World "
01H, 01H, 01H, 01H, 01H, 03H, 48H, 65H, 6CH, 6CH, 6FH, 20H, 20H, 57H, 6FH, 72H, 6CH, 64H, 20H, 20H
```

And in ISO-15765 there is 3 packs, if you have a logger on the can-bus you will see this.

```
10H, 14H, 01H, 01H, 01H, 01H, 03H
21H, 48H, 65H, 6CH, 6CH, 6FH, 20H, 20H
22H, 57H, 6FH, 72H, 6CH, 64H, 20H, 20H
```

4. CAN low level packet

We have selected the newer rev2.0 B structure with 29bit identifier so we can produce nodes with a unique id the top 3bit are for future purpose 26bit gives 0- 67108863 nodes

For more info read: SLLA270

5. Physical Layer

Medco have selected the TJA1051 as driver for the can bus because it's cheaper then LT1796

- Protected from Overvoltage Line Faults to $\pm 58V$
- ESD Protection to IEC 61000-4-2 Level 4
- ±8kV Contact Mode Test
- High Input Impedance Supports Up to 110-200 Nodes (see AN00020)

For more info read the datasheet for the: NXP TJA1051

We have selected 50kb as bus speed to achieve a range of 1000meters, to be compatible with older systems like CD2000.

For more info read: SLLA270

For more information please read about the Can Bus

https://en.wikipedia.org/wiki/CAN_bus