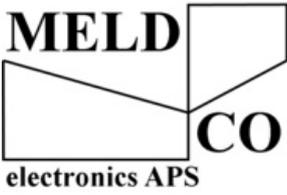


Title:	Nurse call Protocol structure 172-140330.doc	
Author:	ELD	
First Version:	172-140324	
Updated:	172-180911	

(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

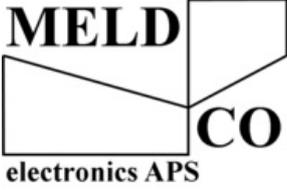
```

### 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](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](https://en.wikipedia.org/wiki/CAN_bus)