

**Minutes of the  
NMRA DCC Working Group Meeting  
Dates: 23 to 25 March, 2006  
Location: Göppingen, Germany**

Attendee list follows the minutes  
Minutes recorded by Didrik Voss and Reinhard Müller



**Meeting Host & Sponsorship**

This meeting of the NMRA DCC Working Group (DCCMWG) was most graciously hosted by Märklin. We wish to thank Märklin for their sponsorship of this meeting, the Märklin factory tour on Friday morning, and their sponsorship of the Friday evening dinner and the Friday and Saturday lunch.



A photo of the attendees (less our esteemed photographer, Mr. Rutger Friberg) in front of one of the Märklin buildings.

**Thursday:**

20:40: After the informal dinner we had a short session to prepare the meeting.  
Didrik Voss stated that manufacturers should take care of topics.  
Peter Ziegler requested topic for Shunting Functions, Function mapping and new instructions.  
Meeting dates and time were discussed. No long meeting possible at the Nuremberg Toy Fair, but that meeting should be kept. However, Saturday is not the optimum time, later, i.e. Monday or Tuesday would be better. The multi-day meeting may be moved further away from the fair. Late September looks good as flight price already lower than before but not within European fair season starting begin of October.  
Session closed as all were tired from travel.

## **Friday**

08:30: Welcome by the Märklin management followed by the tour to the Märklin factory.

10:40: Formal opening of the meeting by Didrik Voss and Reinhard Müller.

### **0309301/0309302: Bi-Directional**

Peter Ziegler reported about the status of **Bi-Directional**. A group of companies interested in Bi-Directional has been formed. They use the name RailCom and their products are built according to the current draft. New ideas came up during implementation. The group consists of four manufacturers: Lenz, Kühn, Tams and Zimo. These manufacturers represent different types of manufacturers within the DCCMWG and therefore are a good representation of the DCCMWG. Therefore these new ideas will be discussed within this group, but they will keep the DCCMWG informed.

On the question about schedule Bernd Lenz stated that the timeline aims on products ready for the Köln Fair in November. There is the intention to have the proposal ready in time for the January 2007 BoD meeting. The main feature to be included is a simpler way to locate a locomotive on the layout. Another transmission window is considered to allow a local detector to report its location information via the (global) rail to the global detector in the power station.

The identification of new locomotives placed on the layout will follow later, as this requires a unique ID in the decoder. A 32 bit ID plus the manufacturer ID from CV 7 will be enough. But this requires at least 8 byte packets, which are not safe using the current check byte approach. Therefore a new packet type may be needed. Peter Ziegler stated that this needs a new topic.

Stan Ames and Bernd Lenz talked about reduced tolerances for the DCC signal when using Bi-Directional for a better timing. New power stations are needed for Bi-Directional anyhow, as the cutout device is nearly as complex. But the Standards are not touched, i.e. for use without Bi-Directional the current tolerances will continue to apply. It is only a different philosophy in setting the timing not as wide as any current implementation may need but to what is achievable with today's technology. The question is, whether the extra window will fit into the existing Cut-Out. Reinhard Müller stated that this discussion should be done in the four manufacturers group. Anybody concerned about a new timing should contact the RailCom group.

### **0603241: New Packet Format**

A new topic has been defined: **0603241** New Packet Format.

The intention is to have the possibility of longer and faster packets.

Peter Ziegler is the topic editor.

### **0409121: Improved Wiring of the Small Connector**

Reinhard Müller reported about topic **0409121** Improved Wiring of the Small Connector. This will go into a Technical Note, as there will be no consensus to include it in the RPs. There will be a note added about the possible need to change bulbs when they are operated at full DCC power.

### **0504023: 21 pin Connector**

Next topic was **0504023** 21 pin Connector.

Reinhard Müller: Products are in the market; therefore any change would result in an RP not reflecting the reality. Therefore the definition should match current products and either moved into RP-9.1.1 or into a technical note. With this connector in RP-9.1.1 there would still be the chance for a connector specification optimized for 2 rail manufacturers (e.g. only two pins for the motor). But it should be mechanically different to prevent fit of the wrong decoder.

Frank Grünig: The pinning does not allow to use only part of the connector where space does not allow the full width.

Arnold Hübsch: There is the question of the speaker impedance because there are many suitable speakers as used in cell phones with less impedance than the stated 100 Ohms.

Jürgen Lindner: The existing decoders were built for use with 100 Ohms only and do not include a protection.

Frank Grünig: Generally no specification is needed as the decoder and the speaker are bought together from the same manufacturer.

Stan Ames: In case the 100 Ohms would be part of the specification it would not be an NMRA but a manufacturer's specification.

A vote was taken whether to include the speaker impedance specification.  
16 votes to remove the spec, 1 (Lindner) to keep it.

AJ Ireland suggested using the same connector with a different pin for coding with a pin out optimized for most 2-rail manufacturers. A coding pin near the middle would also allow to use the inner core part only as Grünig suggested.

A vote was taken for a DC orientated connector based on the same connector type.  
10 agreed with this approach, 8 opposed.

The 21 pin connector will not be put into RP-9.1.1 before the DC orientated connector is defined.

Stan Ames agreed on having the 100 Ohms specified for the 21 pin connector, if the other connector is defined at the same time.

### **0603242: 22 pin Connector**

A new topic has been defined: **0603242** 22 pin DC connector. There is the need to find a more descriptive name to avoid confusion with the 21 pin connector.

AJ Ireland is the topic editor.

Frank Grünig: Current wording asks for the locomotive manufacturer to specify the total current draw but with add-ons like smoke generators this is not possible.

Reinhard Müller will change the wording of the current proposal for the 21 pin connector.

12:50 Break for Lunch

14:30 Rejoin for Meeting

The next topic was the **new test platform**.

Didrik Voss presented a slide with the "1" bit timing of several command stations measured with the PRICOM pocket tester. The numbers were questionable since all timings were quite low and in contrast to other measurements. It needs to be verified how the timing is defined and measured, i.e. zero crossings versus the corners of the waveform where the high and low lever are reached.

**0603245: PRICOM DCC Test Platform Proposal**

**0603243: Scripts for DCC Test Platform**

Next the proposal from PRICOM as distributed on March 20 on the groups Yahoo list.

Stan Ames: The proposal is just the base for a tester. The "scripts" will define the tests and those are not included.

AJ Ireland: We need state flow charts to generate the scripts. The generations of the flow charts are the real work as they will define how to interpret the standards.

Reinhard Müller: What is currently used by C&I? [Editors' note: Attached is a printout of the 1-bit timing test from C&I. DA Voss]

Stan Ames: Ken West's board is used for the standards; manual tests are performed for the functions of the decoder i.e. the RPs.

Didrik Voss: Note concerning page 3, as there are more than 12 functions. Currently we have 30 functions (F0 forward and reverse plus F1 to F28).

Reinhard Müller: Motor load needs to generate BEMF to allow decoders with load compensation tested properly. Without BEMF decoder will output full power with all speed steps.

AJ Ireland: Different time and mechanical constants will be needed.

A discussion about the number of needed motor types started.

Jürgen Lindner: Is there any decoder where BEMF can not be disabled?

Question was raised about the LE130, but Lenz noted BEMF could be disabled without being noted in the manuals.

Norbert Rosch: With BEMF switched off decoder may have different internal timing.

Stan Ames: Then we would need to test with and without sound as well. How shall sound outputs be tested?

Peter Ziegler: Who does all the work writing and maintaining the scripts?

AJ Ireland: 15 \* \$2000 is just \$30 000. The hardware is the cheap part.

Jürgen Lindner: Why not include basic tests based on current testing practice.

AJ Ireland: Too much is undefined. Today there is a lot of interpretation. Flow charts are needed as a diagnostic of the standard. An open source project is needed.

Stan Ames: Avoid the hen and egg problem: Start with the environment.

Bernd Lenz: Do the first step.

AJ Ireland: be aware that this is only the base for testing.

Didrik Voss: Charge those manufacturers not contributing to the cost of the testing platform and the cost of writing test scripts.

AJ Ireland: That will not pay off. We need contribution.

Stan Ames: Stan Ames: Get S-9.1 and S-9.2 tests done as a start.

AJ Ireland: Once we have a flow chart other manufacturers have to check the chart.

A new topic has been defined: **0603243** Definition of Flow Charts.

Stan Ames will take the lead on distributing the tasks.

Peter Ziegler: What are the current problems and what gets solved by the new tester? Most problems are not covered by the RP e.g. installation errors.

Stan Ames: Are we talking about compatibility or interchange problems.

All: The general problems are known problems which are not fixed.

Stan Ames: We need also the programming track tested including current supplied, over current checking and acknowledge detection timing.

Next page 6 with timeline and price was discussed.

Stan Ames: Who will invest? Possibly a tester could be rented to small manufacturers.

AJ Ireland: Only if I know that it will become a test tool.

Rutger Friberg: Use the approach of the car industry. Pay into a bank account, which will be released when the work is done.

AJ Ireland: Go to Robert Scheffler of PRICOM with flow charts and ask him to get a better tester than we have.

Didrik Voss: We need a timeline.

AJ Ireland: Flow charts should be forwarded to Robert Scheffler in September latest.

Stan Ames: Use Visio for flow charts.

Peter Ziegler: We need one professional to do the flow charts.

15:50: Coffee break.

16:15: Meeting continued.

Didrik Voss: Tester precondition for Self-Certify.

Stan Ames: Call it differently, as the NMRA is still in charge to check.

AJ Ireland (regarding Ziegler's comment): The flowcharts are the hard work.

Jürgen Lindner: Robert Scheffler shall provide first part.

AJ Ireland: The development never stops. All manufacturers have to share the information on known problems. Group is the knowledge base needed.

Stan Ames: There will be no response; therefore Ken West's tests need to be ported. Give AJ Ireland a simple test to define the flow chart format. The box acceptance criteria will be that it produces the same results as Ken's tester.

A vote was taken and the group agreed on Stan Ames's approach.

Didrik Voss passed a sign sheet to the group for commitments to buy the test platform.

### **0510241: Revision of RP 9.2.2**

Next topic was **0510241** Revision of RP 9.2.2 (Lower CVs for Acc. Dec.)

Didrik Voss: Intention is opening of more space for the manufacturers.

Stan Ames: 3 things have been tried at the same time:

- a) free reserved CVs and minor changes,
- b) changed CV usage which creates problems,
- c) implement an indexing scheme.

This creates problems. Are the 256 byte pages not too small and need more indices?

Bernd Lenz: With 8 bit microcontrollers page size of 256 is best.

AJ Ireland: If you can use only one index byte for all required actions there may be two index bytes in total. How many pages are NMRA reserved? Answer: 4096 pages.

AJ Ireland: Shall we reserve space per manufacturer?

Jürgen Lindner: Why should we, as we have the NMRA reserved pages. CVs becoming an RP may be moved from "Wild West" [pages free for anybody] to NMRA pages by mapping.

Following there was a wild discussion about manufacturer specific pages.

### **0104191: CV Table Structure**

**0304231: Additional Mfg CVs for Accessory Decoders**

**0307121: New Decoder Register Matrix**

**0504054: Use of NMRA Reserved CVs by Manufacturers**

The other topics dealing with CV assignments – **0104191** CV Table Structure, **0304231**

Additional Mfg CVs for Accessory Decoder, **0307121** New Decoder Register Matrix, **0504054**

Use of NMRA reserved CVs by manufacturers – were declared as **closed**.

### **0408251: In-rush Current Compatibility**

Next topic was **0408251** In-rush Current Compatibility.

AJ Ireland: Suggestion to limit in-rush current to decoder rating.

Solution used by QSI is a relay with a resistor in parallel to limit the current to the rating of the power station for some time.

Jürgen Lindner: Limit to rating is OK. How to distinguish between a short and many decoders?

Joachim Dietz: On some place we have a problem with the number of locomotives anyhow.

Stan Ames: It is a general problem in large scale [loads and storage capacitors not controlled by the decoder]. Power stations and decoders are a pair, no solution on one side only.

AJ Ireland: Easiest place to fix the problem is the decoder.

There was a vote on a proposal to write up some guideline for decoders.

17 in favor for the proposal, 3 opposing

18:00: End of the meeting for Friday.

## **Saturday**

09:00: Continuation of the meeting.

### **9910241: Analog Output Instruction**

Topic **9910241** Analog Output Instruction

Didrik Voss will contact Brian Barnt about state of the proposal and who will continue it.

Currently Soundtraxx, Digitrax, QSI and ESU are implementing (or are going to implement) the corresponding feature.

### **0305051: Decoder Lock Proposal**

Topic **0305051** Decoder Lock Proposal

Reinhard Müller: This is also already in use and should be documented.

AJ Ireland: Keep it simple. It is difficult enough to handle by the modelers.

NCE has a “lock pick” implemented in the command station.

Reinhard Müller: Is there a problem with CV19, i.e. are there any command stations not using the correct instruction – Consist Control 0001 001x – but operations mode programming.

AJ Ireland: Use correct instruction. CV15 is the only CV not locked. Lock only valid for service mode and operations mode programming packets, i.e. excluding decoder control instructions.

Bernd Lenz: Don't change anything with respect to current implementations.

Reinhard Müller will contact the manufacturers currently implementing the decoder lock – Digitrax, Soundtraxx, NCE TCS and Tran – and JMRI as well.

### **0409061: Asymmetric DCC Signal**

Topic 0409061      Asymmetric DCC Signal

Reinhard Müller: This topic is still stalled by a patent.

#### **Patents**

General discussion about patents: The patent holder will give a license and not donate the patent.

There are things to be cleared within the NMRA.

Didrik Voss will check for the written rules.

### **0603244: Location Dependent Control**

Next topic was the location dependent control.

Peter Ziegler distributed three papers (see attachments), Arnold Hübsch showed a presentation: There are two parts: Transfer local information and define what to do as a result, which may be speed of function control.

Bernd Lenz noted the term “cut-out of DCC bits” as wrong.

Peter Ziegler noted that wording has been changed to “cut-out of inter packet bits identical to preamble bits”.

Peter Ziegler explained the current and future forms of cut-outs.

Bernd Lenz: He supports the new functions of the Zimo approach and ABC. ABC is the simple solution where the features of the Zimo approach are not needed.

A new topic has been defined: **0603244 Location Dependent Control** based on the Zimo paper.

### **Restricted Speed Step Instruction with Advanced Operations Instruction**

Peter Ziegler presented the idea of using the 0011 1110 packet (Restricted Speed Step Instruction with Advanced Operations Instruction) for control of switching related functions. Currently only the bit 7 is used for the Zimo “MAN” key, disabling the local speed limit commands.

Reinhard Müller: We have enough functions. Don't use a special packet when there is a more generic approach. Special packet requires command stations to be updated.

A vote was taken and as a result no new topic number was assigned.

### **0504052: Improper Use of NMRA Football**

Topic **0504052** Improper Use of NMRA Football was closed as DCCMWG topic, as this needs to be solved with the C&I department.

The topic about compatibility of new RPs with non conforming decoders was just shortly addressed without any discussion or decision.

The **next meeting** topic was brought up again, as on Thursday not all manufacturers were present and no date had been fixed. Several votes were taken to find the best time for the Nuremberg Toy Fair meeting and it was agreed to hold it on Tuesday 9:00 AM.

For the next multi day meeting in Europe agreement was found for the 3<sup>rd</sup> week of September 2007.

The meeting was closed at 11:30.

## **Participants:**

From 23<sup>rd</sup> to 25<sup>th</sup>:

<u>Name</u>	<u>Company or Organization</u>
Jan Abbink	Abbink Software
Deb Ames	Lenz Agency USA
Stan Ames	NMRA
Joachim Dietz	Dietz
Rutger Friberg	NMRA
Dr. Frank Grünig	Fleischmann
Gunther Hohlbaum	Dietz
Arnold Hübsch	AMW
Richard Kopplinger	Modelleisenbahn GmbH
Bernd Lenz	Lenz Elektronik GmbH
Peter Littfinski	Littfinski Datentechnik
Alexander Lücke	Uhlenbrock Elektronik
Reinhard Müller	NMRA
Ingo Planert	Viessmann
Norbert Rosch	Mathoth
Rainer Schmitz	Gebr. Märklin
Winfried Seewald	Tillig GmbH
Ewald Sperrer	STP Software
Frank Stöhr	Mathoth
Kersten Tams	Tams Elektronik GmbH
Jack Treves	MOROP
Didrik Voss	NMRA - Chairman DCCMWG
Andreas Weiss	Gebr. Märklin
Peter Ziegler	Zimo Elektronik

From 24<sup>th</sup> to 25<sup>th</sup>:

<u>Name</u>	<u>Company or Organization</u>
A.J. Ireland	Digitrax
Zana Ireland	Digitrax
Hiroshi Kato	Kato
Andreas Koch	ESU
Günther Kreischer	Kreischer Datentechnik
Torsten Kühn	Kühn digital
Masayuki Kunitake	Kato
Andreas Lau	ESU
Jürgen Lindner	ESU
Jürgen Pudert	Gebr. Märklin
Lars Schilling	Gebr. Märklin
Marcel Thomas	CDF