


<h1><b>Michiana Division</b></h1>  <p>National Model Railroad Association Midwest Region</p> <h1><b>FORM - 19</b></h1>	<p><b>Model Railroading in the Digital Age</b></p> <p>CV29 Configuration Bits</p> <p><i>Description</i> Decoder Configuration Feature Bits <i>Values</i></p> <p><i>Initial Value</i> 6 (Primary Address) <i>Related CVs</i> <a href="#">CV1</a>, <a href="#">CV1Z</a>, <a href="#">CV18</a></p>
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## A publication of the NMRA, Midwest Region, Michiana Division

Model Railroading in the Digital Age is the slogan of the Newsletter.

In keeping with this line we will feature digital information depicting aspects of digital modeling.

### 1st QUARTER DIVISION EVENT SCHEDULE

**SATURDAY, January 15**  
**10:00AM CT, 11:00AM ET**  
**Meeting via Zoom**

**SATURDAY, February 19**  
**10:00AM CT, 11:00AM ET**  
**TBD**

**SATURDAY, March 19**  
**10:00am CT, 11:00am ET**  
**Elkhart Model RR Club**  
**Train Show**

**PLEASE,  
STAY SAFE  
AND HEALTHY**



### January 2022 Form-19 Superintendent's Message. Happy New Year Model Railroaders!

We need you! Please consider getting more involved in your local region of the National Model Railroad Association. There is so much we can do together that we really can't do as individuals. The Michiana Division Board of Directors is happy to announce that our membership has been sustained through the difficult years of 2020 and 2021. As we begin 2022, we have a strong group of members who are happy to continue to plan and deliver clinics, field outings, and in-person meetings. Those activities and more will be enhanced when other members attend and contribute to these activities. To get involved, contact me, or any member of the Board of Directors, listed at the end of the Newsletter and let us know how you'd like to contribute. There are opportunities to develop and deliver new clinics, write articles for the newsletter, plan and organize outings, help with the administration of the division, and many more. You'll make new friends, learn more about prototype and model railroads, and improve your skills.

Our January meeting will be held via Zoom on Saturday, January 15, 2022, at 11 AM Eastern / 10 AM Central. Our topic will be the Zoom clinics that have been delivered on Thursday evenings since May 2020 that are sponsored by our Michiana Division and delivered to a national audience. Since May 2020 we have had over 70 Zoom clinics delivered in addition to the monthly Saturday clinics that have continued during the pandemic. *Continued on next page.*

**Superintendent Report, Cont.**

These meetings have all been recorded and are available on our Michiana Division YouTube channel. An online index of these clinics is being developed and will be premiered at our meeting on January 15<sup>th</sup>. We will demonstrate how to navigate the index to find content that might be interesting to you and discuss the methods used for you to prepare and deliver clinics in this way. It has never been easier to deliver a presentation to an audience that is next door or thousands of miles away. Please plan to join us for this meeting.

**Greg Buelmann, Division Superintendent**

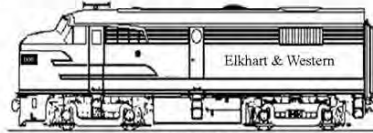
**Welcome to the 1st Quarter of the FORM-19 for 2022**

**Invitation:** Please join us in our meetings for fellowship and learning with other model railroad enthusiasts. We meet on the 3<sup>rd</sup> Saturday, almost every month. See the location, time and topic at <http://michiana-nmra.org/meetings.html> as well as topics from previous meetings. The **next meeting** is **January 15**. You will receive an email via “**groups.io**” with additional information for the meeting.

**Future meetings & ideas for topics:** Future meetings for the Division would like to alternate locations between eastern and western areas of the Division, attracting more members from west of La Porte. Also, we may be able to “Zoom” some meetings in the future for those who cannot attend in person. We invite you to suggest topics interesting to you. You can do this by posting your ideas on the Division’s **groups.io**. Meeting locations and other attractions are mapped at <http://www.michiana-nmra.org> just click on “Resources” “Michiana Division Interactive Map”.

17th Annual  
**TRAIN SHOW**

Presented by  
The Elkhart Model Railroad Club



**SATURDAY**

**MARCH 19th, 2022**  
10:00 A.M. to 3:00 P.M. (E.D.T.)  
**Claywood Event Center**  
13924 N 1100 W ( County Line Rd. )  
Nappanee, Indiana 46550

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**Elkhart Model RR Club Train Show**

This years Elkhart Train Show is scheduled for Saturday March 19, 2022. There will be 150 vendor tables of products for all scales of model railroading, books and prototype railroad items. Show hours are 10:00am to 3:00pm Eastern Time. Address is 13924 N 1100 W (County Line Road), Nappanee, Indiana 46550 Admission is \$5.00, Ages 12 & under free with paid adult.

For complete show information and other up to date Club happenings please visit the Club’s website at: [www.emrrc.com](http://www.emrrc.com)

## Configuration Variable (CV29)

By Chuck Hart

### You have just purchased a new DCC equipped locomotive. What next?

I've mentioned before about the Ron Christensen, MMR daily email list of subjects. Awhile back the question of mobile decoder programming was on the agenda. The discussion included programming on the MAIN, using JMRI (Java Model Railroad Interface), using the DC Analog option or not, momentum (Accel-CV3 and Decel-CV4, Start Voltage-CV2, and CV29 among other elements of programming.

Lets start this discussion on a basic level. Your new DCC equipped locomotive sent from the manufacturer is programmed to run on address #3, and has the capability for Analog DC operation. To set the DCC Decoder to operate within this manner the Configuration Variable CV29 set to a value of '6'.

Assumption is you have a track setup for testing your locomotives. You do have a test track, right? My test track can be used in both Operation and in Program Mode controlled by a switch between the test track and the DCC Command Station. Usually the first thing you want to do is put the new LOCO on your test track in the Operation Mode and see if the locomotive runs. Set the LOCO on the test track, set you throttle for address #3, turn on the track power and turn up the throttle speed. Run it forward, backward, turn on the lights, test horn, bell, etc. if sound equipped. Yea, it runs great. So far so good, great!

What next? You will want to Program your new locomotive to fit into your layout operational scheme. Now is the time to make a number of decisions before continuing with programming of the decoder for your new locomotive. Here is a list of the most common questions I consider before continuing.

- . Will this locomotive use a two-digit or four-digit number?
- . What number of speed steps do you want? (14, 28/128-speed steps)?
- . Will the locomotive usually run long hood forward or short hood forward?
- . Will I use a speed table for fine-tuning the locomotive speed control?
- . Will I want DC Analog enabled or disabled?

You may ask around to friends, club members or the hobby shop owner and they all will have lots of suggestions. Most will say to program CV29 first and they all have a different suggested value for you to use. I have one friend that always uses a value of '18', others use '34', 20, 37, 54 etc. So what to do?

The above operational capabilities are made by how CV29 is configured. Remember, most new locos are shipped with a CV29 value of '6'. What does that mean?

*(Note: bits 3 Rail Com only, 6 and 7 are not used in CV29 for motor decoders)*

- . Bit 0 is OFF; Normal direction of travel is forward (usually short hood forward).
- . Bit 1 is ON; 28/128 speed steps.
- . Bit 2 is ON; Analog DC capability.
- . Bit 4 is OFF; Speed table disabled.
- . Bit 5 is OFF; Two-digit address enabled.

*Bits???* What are they and how do I turn them ON and OFF?

## Configuration Variable (CV29) Cont.

**A short word about DCC Configuration Variables (CVs).** Each CV is made up of a computer byte of information consisting of eight bits. 0 through 7. Each bit can be either '0' or '1'. A '0' means the bit is turned off and '1' means the bit is turned on. When a bit is off (0) the value of that bit is 'zero'. When a bit is turned 'ON' the bit represent a decimal number other than zero used by the decoder firmware.


- Bit 0 when on is 1.
- Bit 1 when on is 2.
- Bit 2 when on is 4.
- Bit 3 when on is 8.
- Bit 4 when on is 16.
- Bit 5 when on is 32.
- Bit 6 when on is 64.
- Bit 7 when on is 128.

Sample BYTE/BIT pattern

	bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
	0	0	0	1	0	0	1	0
When bit is set to 1, value =	128	64	32	16	8	4	2	1
Therefore:	0 + 0 + 0 + 16 + 0 + 0 + 2 + 0 = 18							

All CVs use the total of the 'ON' decimal values to apply a specific action except for CV29. The sum of the CV29 Bit's decimal values allows the decoder firmware to interpolate how certain actions are implemented during decoder operation.

The photo at left is from the Technical Manual of my BLI N Scale Light Pacific. This page is a little daunting and is typical of other technical manuals for locomotive motor decoders however, by knowing how the bits are used you will be able to more understand you manual.



### SYSTEM CVs

**CV29**  
Configuration Bits

*Description*  
Decoder Configuration Feature Bits

*Values*

*Initial Value*  
6 (Primary Address)

*Related CVs*  
[CV1](#), [CV17](#), [CV18](#)

Bit 7	0	0	EA	0	0	1	1	0	Bit 0
-------	---	---	----	---	---	---	---	---	-------

Bit 5: EA (Extended Address Mode Enable)  
0 = Decoder Responds to Primary Address CV1  
1 = Decoder Responds to Extended Address CV17, CV18

Bit 4: 0 = Speed Table set by CV2, CV5, CV6 (DCC and DC)  
1 = Speed Table set by CV66–CV95 (DCC and DC)

Bit 2: 0 = DCC Only  
1 = DC Enabled

Bit 1: 0 = 14 speed step if controller set for 14 bits  
1 = 28 speed step if controller set for 28 bits  
x = ignored in DC mode; 28 steps used

Bit 0: 0 = normal lighting for front and rear lights  
1 = reverse lighting for front and rear lights

50

Look at the picture in the manual of Bit 0 through Bit 7. As you can see by adding the decimal values of the bits that are turned on and off the total value sums to '6'.

- Bit 0 is OFF = 0
- Bit 1 is ON = 2
- Bit 2 is ON = 4
- Bit 4 is OFF = 0
- Bit 5 is OFF = 0

Remember Bits 3, 6, and 7 are not used.

So from the manufacturer the BYTE for CV29 is interpreted by the decoder firmware for:

- Normal direction
- Use 28/128 speed steps
- Use Analog DC capability,
- Use CV2, CV5 and CV6 for speed control
- Use two-digit addressing, CV1

And not use long digit addressing CV16 and CV17. Yes, the bit values in CV 29 will also affect other CV parameters!



## Configuration Variable (CV29) Cont.

The factory default value for CV29 is 06.

CV Value For CV29 HEX / DEC	Speed Steps/ Speed Table	Analog Mode Conv	Normal Direction Of Travel	2 or 4 Digit Adr	
x00	000	14	OFF	Forward	2
x01	001	14	OFF	Reverse	2
x02	002	28/128	OFF	Forward	2
x03	003	28/128	OFF	Reverse	2
x04	004	14	ON	Forward	2
x05	005	14	ON	Reverse	2
<b>x06</b>	<b>006</b>	<b>28/128</b>	<b>ON</b>	<b>Forward</b>	<b>2</b>
x07	007	28/128	ON	Reverse	2
x10	016	14 Speed Table	OFF	Forward	2
x11	017	14 Speed Table	OFF	Reverse	2
x12	018	28/128 Speed Tbl	OFF	Forward	2
x13	019	28/128 Speed Tbl	OFF	Reverse	2
x14	020	14 Speed Table	ON	Forward	2
x15	021	14 Speed Table	ON	Reverse	2
x16	022	28/128 Speed Tbl	ON	Forward	2
x17	023	28/128 Speed Tbl	ON	Reverse	2
x20	032	14	OFF	Forward	4
x21	033	14	OFF	Reverse	4
x22	034	28/128	OFF	Forward	4
x23	035	28/128	OFF	Reverse	4
x24	036	14	ON	Forward	4
x25	037	14	ON	Reverse	4
x26	038	28/128	ON	Forward	4
x27	039	28/128	ON	Reverse	4
x30	048	14 Speed Table	OFF	Forward	4
x31	049	14 Speed Table	OFF	Reverse	4
x32	050	28/128 Speed Tbl	OFF	Forward	4
x33	051	28/128 Speed Tbl	OFF	Reverse	4
x34	052	14 Speed Table	ON	Forward	4
x35	053	14 Speed Table	ON	Reverse	4
x36	054	28/128 Speed Tbl	ON	Forward	4
x37	055	28/128 Speed Tbl	ON	Reverse	4

CV29 is one of the most misunderstood Configuration Variables. I hope by knowing a little bit about how BYTES and BITS control how the decoder firmware works will help you understand how other CV's work. We'll explore other CV's in future FORM-19 Newsletters.

Now, to make programming CV29 a little easier we can use the Table to the left. This table is from a Digitrax Manual and is typical in most manuals. Look at the Decimal column and find the value '6'. This is the default parameter for CV29 from the manufacturer. By choosing your desired operational parameters and then referring to the decimal value you will know what number to use for CV29 for your new locomotive. Remember you can change this value at any time in the future as to how you want to operate your locomotive and as your layout matures.

On my layout I use CV29 values of 18, 34 and 50 for my locomotives depending on their use on my layout.

Do you need the table? No.

**Let's say you want:**

- Reverse direction lighting (long hood forward)
- 28/128 Speed steps.
- Analog DC off.
- Use Speed Table
- 4 Digit Address.

Bit '0' ON = 1

Bit '1' ON = 2

Bit '2' OFF = 0

Bit '4' ON = 16

Bit '5' ON = 32

The decimal values sum = 51.

Compare this to the table.

You would enter 51 for the value of CV29. So by knowing the decimal value and meaning of each BIT you can program CV29 with a throttle that has programming capability.

## CV29 TECH TIP

A new locomotive needs to have a wired DCC decoder installed. The locomotive runs great on DC and you have tested the decoder before installation. You did test the decoder before installing it, right? You might even program the decoder before the install too. All goes well except the locomotive runs backward when the throttle selects forward. OOPS, the motor wires have been wired backwards. The easy fix instead of rewiring is to adjust CV29. Lets use a CV29 value of '34' for this sample. Just reprogram CV29 to next high (ODD) value of '35'. Remember, the direction of travel is controlled by Bit 0 which is either OFF or ON, or a decimal value of 0 or 1. All of your other options selected in CV29 will remain the same. A quick study of CV29 Table on page 5 will help you understand the full benefits of CV29's capabilities.



# NMRA NEWS



## DISPATCH

2021 #09

December 7, 2021

### NMRA Digital Publications Update

You spoke and we listened. Following the end of our digital publications research, the NMRA Board of Directors voted unanimously on Sunday, December 5, 2021, to move forward with a digital version of the NMRA Magazine. This decision was based on research, feedback from almost 3700 members, and discussions with each Region's leadership, the CFO, and the heads of our IT, Publishing, and Marketing Departments. That research showed overwhelming support for a digital version of our magazine alongside the traditional print option. Therefore, the decision does not mean that the paper magazine is disappearing. Life Members will receive both print and digital versions of the NMRA Magazine, while all Full, Student and Rail Pass members will receive our digital NMRA Magazine with the option to subscribe to the print version.

The NMRA is now moving into the implementation phase of this project.

We will continue to communicate and share more details with you in the coming months as we move forward with this project. If you have UI or graphic design skills you would like to offer your support to the NMRA digital publications project, please get in touch.

Gordy Robinson, MMR

President

National Model Railroad Association



NATIONAL MODEL RAILROAD ASSOCIATION, INC.

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MIDWEST REGION NEWS

<http://www.mwr-nmra.org>

**Registration for the May 18-22, 2022 *Indy Junction*  
Tri-Region 2022 convention is now OPEN  
*Indy Junction* will be jointly hosted by the three Regions.  
Midwest, North Central & Mid Central  
The convention facility will be  
The Marriott East  
7202 E 21st St  
Indianapolis, IN 46219**



Marriott East, 7202 E 21<sup>st</sup> St  
Indianapolis, IN 46219



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[www.IndyJunction2022.org](http://www.IndyJunction2022.org)



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CHICAGOLAND





## Support Your Local Michiana Division

**Two Division Director positions will be up for election in April 2022. These positions are elected during the Annual Membership Meeting. Consider joining the Division board and help develop Division Activities. Contact Nominating Committee Chairman, James Temple, email: [jngtemple@yahoo.com](mailto:jngtemple@yahoo.com)**

### Michiana Division Committees

AUDIT COMMITTEE	JIM TEMPLE
NOMINATING COMMITTEE	JIM TEMPLE
ELECTION COMMITTEE	JIM TEMPLE
MEMBERSHIP COMMITTEE	NEAL THOMAS
CLINIC COMMITTEE	RON CHRISTENSEN, MMR
INTERNET COMMITTEE	GREG BUELTMANN
PUBLICATIONS COMMITTEE	CHUCK HART
CONVENTION COMMITTEE	VACANT
MEET LOCATION COMMITTEE	JOHN BANICKI
AP CHARIMAN	JERRY PETERSON

We are always looking for help with organizing and making the division stronger from within the membership. Please consider taking the load off by volunteering a small amount of your time.

### ***NOTICE - Michiana Division YouTube Channel is now live!***

You can now view videos from our Division ZOOM meetings and other events videos. Check out our YouTube channel at <https://www.youtube.com/channel/UCbvaWZMhVoRweILW3aiXZIQ>  
We will be transferring previous videos and others into that channel as time permits.

### Michiana Division - 2815

The Michiana Division was activated effective September 13, 2009.  
Includes the following Counties in Indiana: Elkhart, Fulton, Jasper, Lake, La Porte, Marshall, Newton, Porter, Pulaski, Saint Joseph, and Starke and the following Counties in Michigan: Berrien and Cass.

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