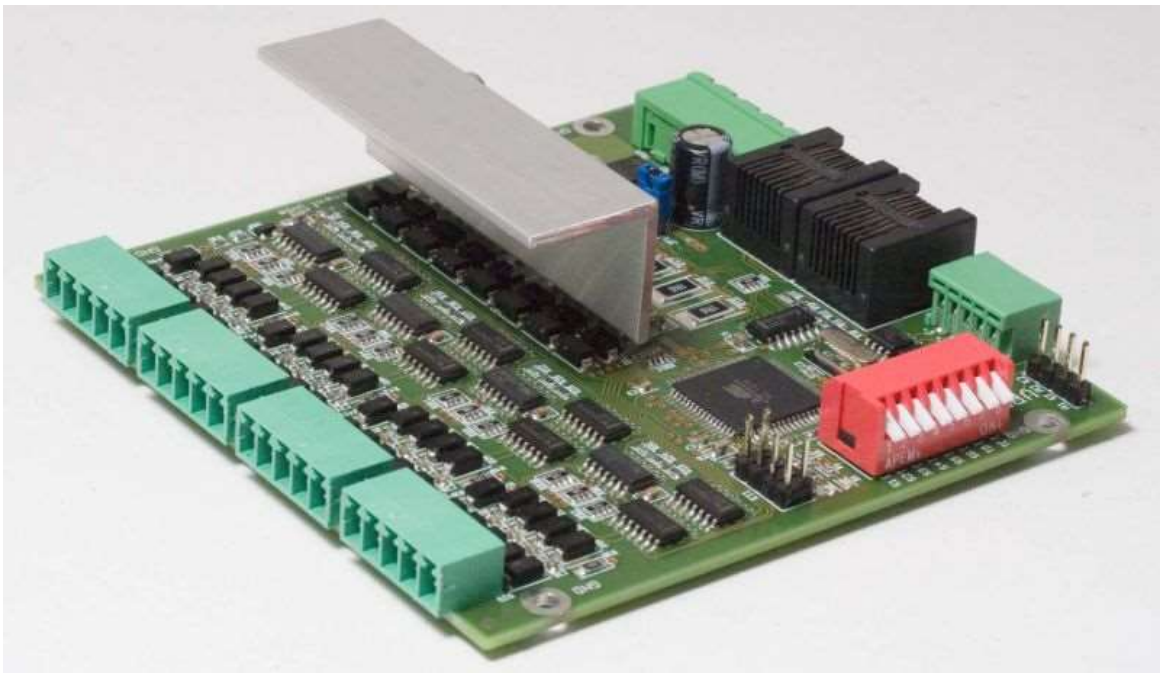
DTS Tutorial:
TM44 addressing



TM44 is een product van VPEB

Content

Introduction

The TM44 is part of the hybrid Dinamo system and is used for block-controlled driving of trains. The TM44 module is the successor to the TM-H which was part of the classic Dinamo system. We have noticed that there is much uncertainty about addressing the TM44. In this tutorial we hope to reveal how addressing was established, how it should be applied.

As a partner of VPEB and an official Dinamo representative, we guide many model trackers with their start with this system. Dinamo has many advantages over the conventional digital systems. This includes computer-controlled driving with both analogue and digital trains, no problems with short circuits and polarization. That makes turning loops no longer a problem, and the well-known "dcc ceiling" simply does not exist.

But all those advantages also have its disadvantages. For example, some processes of the system may seem complicated to the untrained user. Our job is to make the material tangible for the starting Dinamo user. We do this with the broad level of support that we offer users as well as by making this tutorial.

If you have any questions or comments, you can post them by sending an email to info@domburgtrainsupport.nl

Best regards,
Martin Domburg

Documentation: Manual TM44 – www.vpeb.nl

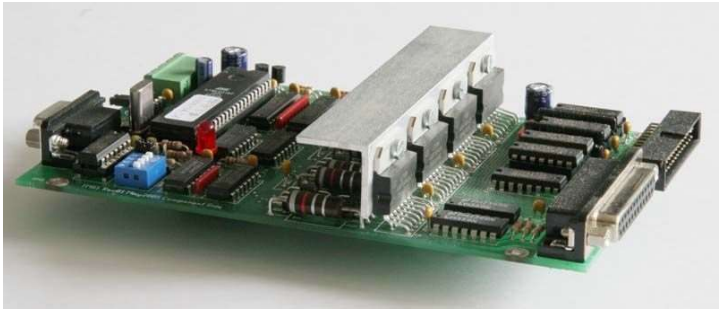
Addresses

Dinamo has four types of addresses that function independently of each other and can be controlled:

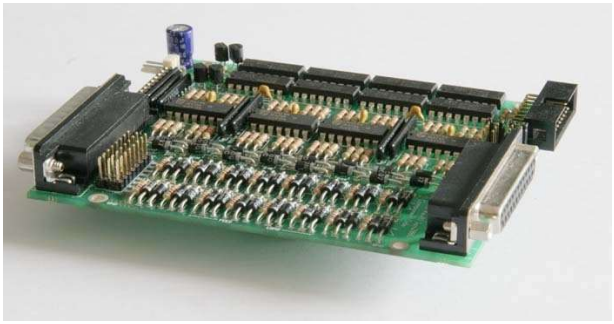
1. Module addresses, the address with which the modules communicate with the control panel
2. Block addresses, with this the software controls a block of a block card
3. Busy notification addresses, with which the TM44 detection can report to iTrain
4. Accessory addresses, these are the outputs of the OC32 with which you control switches and signals.

The story behind the addressing

In the Dinamo system, all modules have their own address and the block cards are equipped with block control complete with current detection. The TM44 has 4 blocks, each block of which has 4 occupancy detectors.



TM-H block card from the Dinamo Classic system



CD16 for current detection

But this has not always been this way. In the past, Dinamo was really intended for the model railroader with electrical engineering knowledge. The TM-H block card was provided with 8 blocks, to which a total of 128 switches could be connected. With so-called CD16 modules you provided each block with 2 occupancy detectors based on current detection.

It is therefore processed in the Dinamo system that each address automatically reserves several block addresses and Busy reporting addresses. That means that the first module address 0, reserves the block addresses 0 to 7 and the detector addresses 0 to 127.

> Explanation:
>
> Dinamo starts with counting from 0, software such as leader and iTrain do not. Software starts counting from 1. If you enter address 1 in the software, the program itself translates that to Dinamo as address 0.
>
> For the sake of convenience, we will now count from 1!

With the software count this means that the first module address 1, the block addresses 1 to 8 and the detector addresses 1 to 128. The second module with address 2, then reserves the block addresses 9 to 16 and Busy reporting addresses 129 to 256. If you use iTrain you do not have to calculate yourself, this

program can group the for you. More about this later. The Dinamo central RM can handle up to 16 module addresses, which means that there is room for 128 blocks and 2048 occupancy detectors.

The big problem was that with the arrival of the TM44 this block card could not copy the same configuration as the TM-H and CD16. Because the prints would then simply become too large. VPEB has chosen to design the TM44 with 4 blocks instead of 8 blocks. This made the modules considerably smaller and more convenient.

In addition, the TM44 had to remain compatible with the current Dinamo interface layout, but with 16 module addresses of 4 blocks, the capacity would be halved. And in addition, the users of the TM-H must have the possibility to expand their system with the TM44.

To achieve this, the TM44 started to function as a "half block card" or, more precisely, a half module address. This automatically means that two TM44 modules are required to fill 1 module address. In this way it is possible to combine the TM44 with the TM-H without affecting the capacity in addresses.

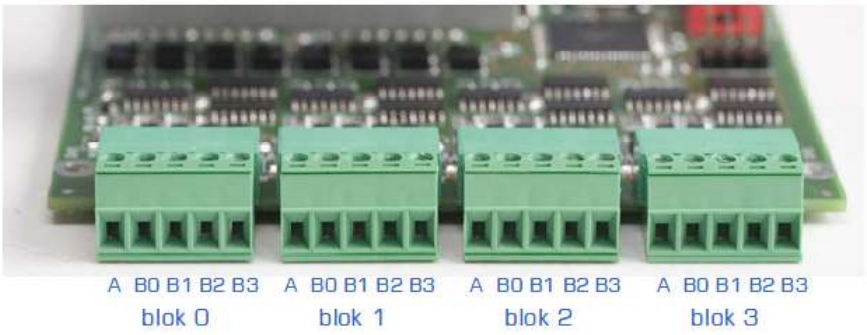
Briefly summarized:

- ✓ Dinamo has 16 module addresses
- ✓ The system reserves 8 block addresses per module address
- ✓ The system reserves 128 busy reporting addresses per module address
- ✓ A TM-H fills 1 module address with 8 blocks and 128 occupancy detectors
- ✓ A TM44 fills 0.5 module address with 4 blocks and 16 occupancy detectors
- ✓ The first TM44 has the primary part of a module address
- ✓ The second TM44 has the secondary part of a module address
- ✓ Primary and Secondary fill 1 module address together

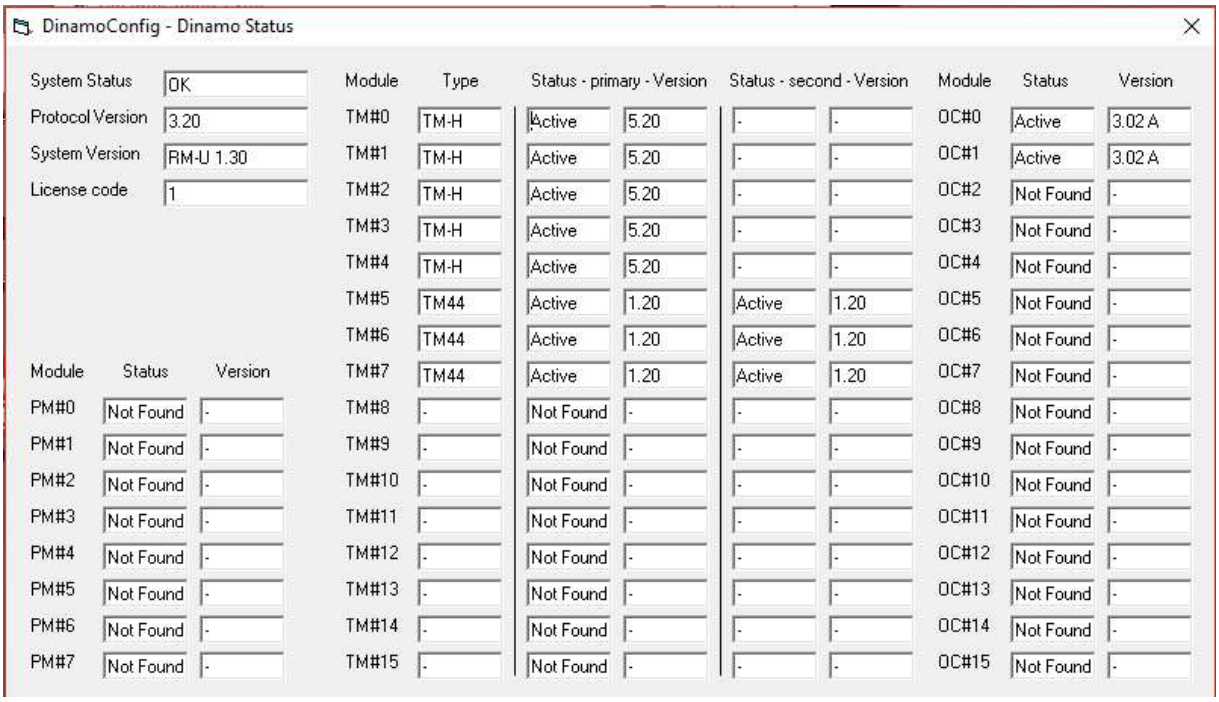
How does the addressing work at TM44?

We now know that there are 16 module addresses available in Dinamo and that two TM44 modules are required per module address.

If we look at module address 1, the TM-H also has simple address 1. However, the module address for the TM44 is split into a primary module address and a secondary module address. The primary gets address 1.0 and the secondary module gets the address 1.1. Together they form module address 1.



Confused? It looks something like this:



To clarify it, I used a screenshot of the system status on one of my model jobs.

In the status overview of Dinamo, you see that the first 5 addresses have been entered by a TM-H, then I continued with the TM44 (from TM # 5) and then you suddenly see two modules per module address. If you look at the top of the table you will see that the left column, next to the column with the type, is the primary modules and the right column is the secondary modules. And so, you can include a total of 2x 16 TM44 modules in your Dinamo bus.

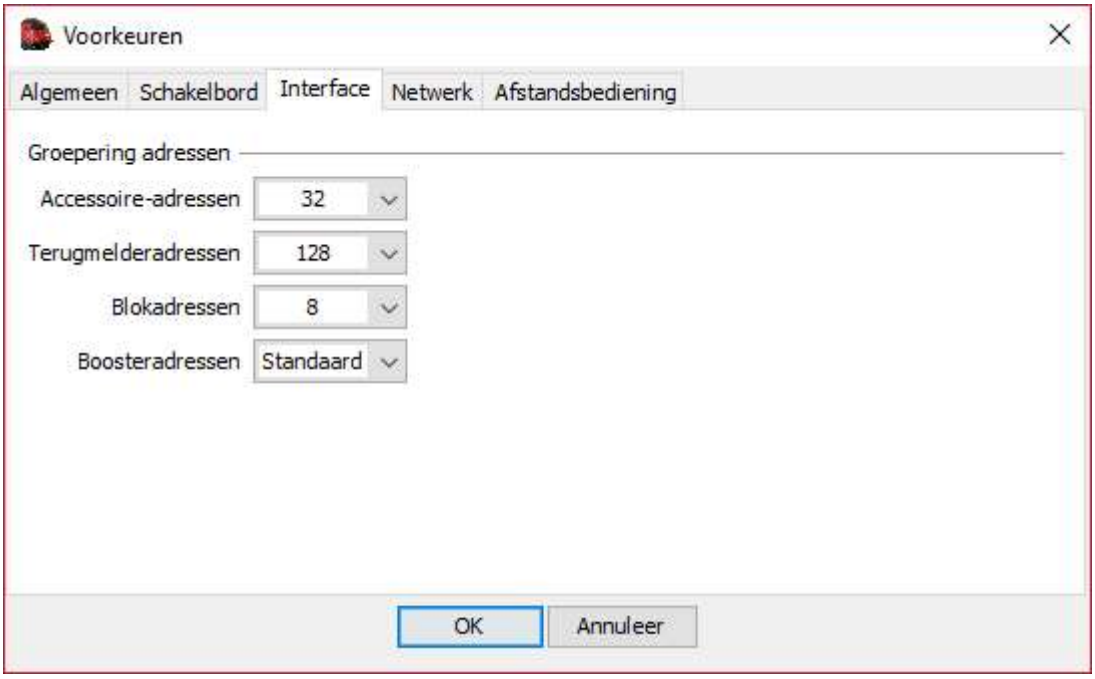
Small hint: at the primary addresses, the digit for the dot (1.0, 2.0, 3.0, etc.) changes and that is always the first switch on ON on the DIP switch. With the secondary modules, the 0 behind the dot changes to 1 (1.1, 2.1, 3.1, etc.). Always switch the first switch to OFF on the DIP switch.

Incidentally, it is not advisable not to use the secondary modules, because you no longer have 16 modules. The RM-C then continues to search for the missing secondary modules.

Grouping in iTrain

Because counting from 1 to 128 at the blocks and from 1 to 2048 at the detectors is quite an annoying job, we prefer not to do that naturally. If you use iTrain then that is not necessary, it does that for you.

At Change> Preferences you will find the Interface tab. Here you can indicate the grouping. Here we provide the following values for Dinamo:



Example:

If you now enter block address 9, then he will make it 2.1 himself. Behind the scenes, he still controls block address 9. But for yourself this is a lot easier because you immediately see which module, and which output you have used.

The addresses of the blocks and detectors

Enough has been written about the module addresses above, because we are mainly dealing with block addresses and busy address addresses.

As mentioned, the TM44 is half an address, so it only uses half a reservation.

While the TM-H claims the full 8 blocks, the TM44 only fills in 4. The same applies to the 128 occupancy detector addresses that are assigned to that module address.

Just explained very simply:

Blocks

- ✓ The primary TM44 receives the block addresses 1 to 4
- ✓ The secondary TM44 gets the block addresses 5 to 8

In summary, it works like this in iTrain:

- ✓ TM44 0.0 serves the blocks 1.1 to 1.4
- ✓ TM44 0.1 serves the blocks 1.5 to 1.8
- ✓ TM44 1.0 serves the blocks 2.1 to 2.4
- ✓ TM44 1.1 serves the blocks 2.5 to 2.8
- ✓ And so on until the 16th module address is filled.

Occupancy detectors

This is a bit trickier, here a range of 128 is split in two. The first 64 detectors (1-64) are for the primary module address, the second set of 64 detectors (65-128) for the secondary module address,

The primary TM44 will receive the busy reporting addresses 1 to 16

The secondary TM44 is assigned the occupancy reporting addresses 65 to 80

In summary, it works like this in iTrain:

- ✓ TM44 0.0 uses the occupancy detectors 1.1 to 1.16
- ✓ TM44 0.1 uses the occupancy detectors 1.65 to 1.80
- ✓ TM44 1.0 uses the occupancy detectors 2.1 to 2.16
- ✓ TM44 1.1 uses the occupancy detectors 2.65 to 2.80
- ✓ And so on until the 16th module address is filled.

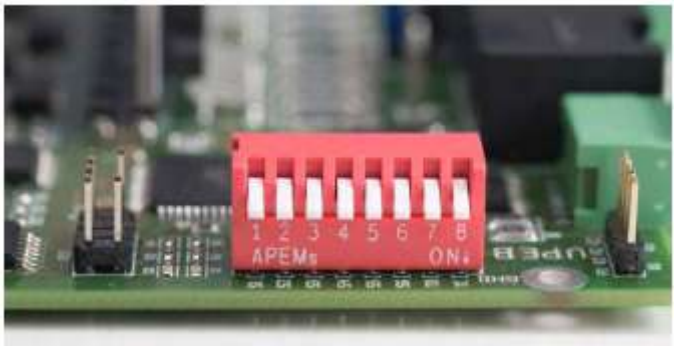
Address table

Adres	S1	S2	S3	S4	S5	Adres	S1	S2	S3	S4	S5
0.0	On	On	On	On	On	0.1	Off	On	On	On	On
1.0	On	Off	On	On	On	1.1	Off	Off	On	On	On
2.0	On	On	Off	On	On	2.1	Off	On	Off	On	On
3.0	On	Off	Off	On	On	3.1	Off	Off	Off	On	On
4.0	On	On	On	Off	On	4.1	Off	On	On	Off	On
5.0	On	Off	On	Off	On	5.1	Off	Off	On	Off	On
6.0	On	On	Off	Off	On	6.1	Off	On	Off	Off	On
7.0	On	Off	Off	Off	On	7.1	Off	Off	Off	Off	On
8.0	On	On	On	On	Off	8.1	Off	On	On	On	Off
9.0	On	Off	On	On	Off	9.1	Off	Off	On	On	Off
10.0	On	On	Off	On	Off	10.1	Off	On	Off	On	Off
11.0	On	Off	Off	On	Off	11.1	Off	Off	Off	On	Off
12.0	On	On	On	Off	Off	12.1	Off	On	On	Off	Off
13.0	On	Off	On	Off	Off	13.1	Off	Off	On	Off	Off
14.0	On	On	Off	Off	Off	14.1	Off	On	Off	Off	Off
15.0	On	Off	Off	Off	Off	15.1	Off	Off	Off	Off	Off

Setting the addresses

Setting the addresses is not a difficult job. In the table above you can see the 16 primary addresses 0.0 through 15.0 and the 16 secondary addresses 0.1 through 15.1. There is an ON and OFF combination behind each address. This combination of 5 together form the address that the module will receive.

You can see this Dip switch on the TM44:



The Dip switch has 8 switches, the first 5 are used for the address, the switches 6 are for master / slave selection (see below) and the switches 7 and 8 are for the data and clock network which are discussed in another tutorial.

If you look closely at the table, you will see that module address 0.0 (in iTrain 1.0) gives the combination that S1 to S5 must be set to ON. On the block you will see the text ON with an arrow, this can vary per type of DIP switch to which the arrow points. The fact is that the arrow always points to the ON position.

The switches 1 to 5 are therefore down on this module. The following address 0.1 (in iTrain 1.1) indicates that S1 is OFF and S2 to S5 is ON. In this picture the left switch is up. This way you can use the entire address by making combinations with the switches.

You must always change the position when the power supply of the TM44 is switched off. Before switching on, press the reset button of the RM-C so that it starts searching for modules again. In the unlikely event that the voltage is on, you must switch the voltage off and on again. Also please reset the RM-C so that it starts searching again.

Master en slave

In the Dinamo bus there must and may only be 1 "master" module, this module directs the clock network synchronization.

If you only have TM44 modules, then you make the TM44 that is closest to the RM-C in the bus master, and the rest slave.

If you use a combination TM-H and TM44 then one of the TM44 modules must be a master, not a TM-H. And preferably the TM44 that is closest to the RM-C on the bus.

To make a module master or slave, use the 6th switch on the Dipswitch module, S6. In the ON position the module is master, in the OFF position the module is Slave.

From TM44 Firmware 1.21 it is possible to check the master slave via DinamoConfig in combination with DinamoConfig 1.32. Make sure the TM44 is equipped with firmware 1.21 or higher, the TM-H is equipped with firmware 5.21 or higher and install DinamoConfig 1.32. Then proceed as follows in DinamoConfig once the RM-C has recognized all modules. The orange LED lights up continuously on all modules.

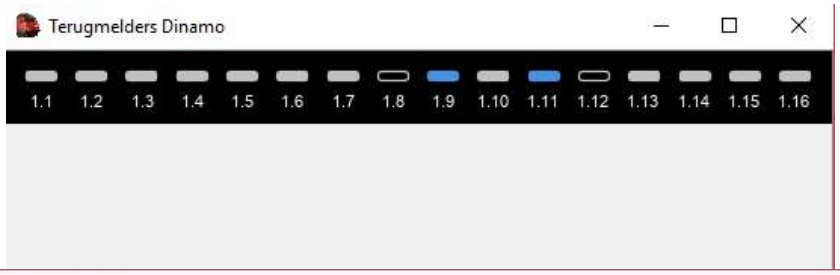
1. Open DinamoConfig
2. Select the Compoort
3. Click on “Reset Fault”
4. Click on "Status"
5. Check that the system has seen all TM44 modules and that they are all equipped with firmware 1.21 or higher
6. Exit the status menu and go to the left tab
7. Select the text “All_TMxx” in the drop down
8. Click in the bottom right on "check MS"
9. You will receive a pop-up stating whether the Master / slave configuration is correct
10. The pop-up asks if you also want to check the clock network, click OK.
11. The pop-up now indicates whether the clock network is OK.
12. Close DinamoConfig again

If the MS test is not satisfactory, you probably indicate that the master is missing or that there are several masters in the bus. Then change the configuration, restart the system and perform these steps again.

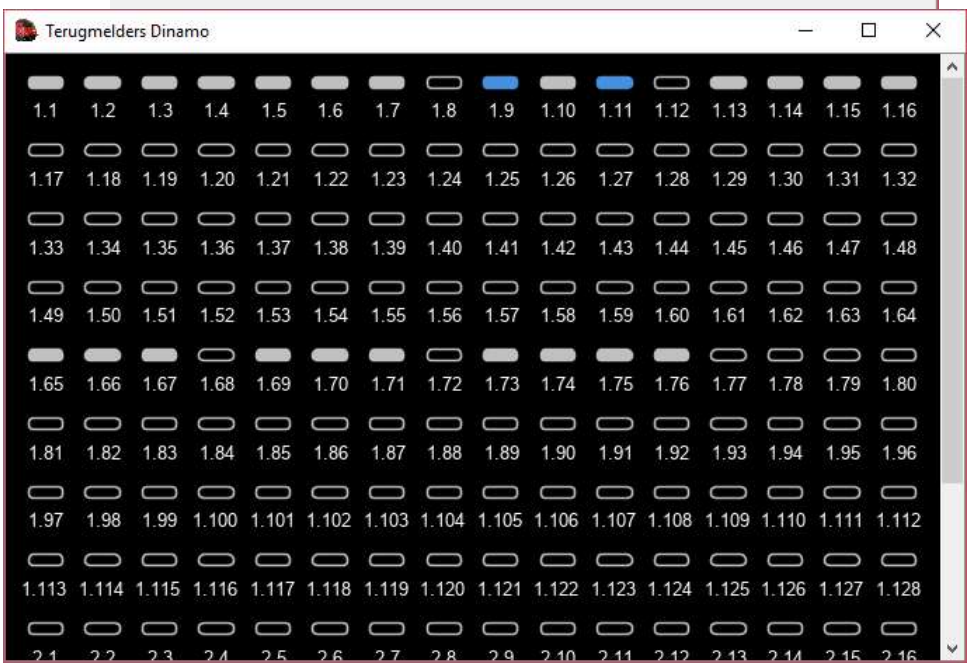
Finding addresses by using iTrain

Once everything is in order you can go to iTrain and make the connection there. The great thing about iTrain is that it has a feedback monitor:

When you open this, you will see a screen:



You can expand or reduce the number of visible detectors with the + and - keys. By enlarging the window, you zoom in and the detectors become larger. If the grouping is filled in correctly you will eventually get this picture:



Here you can see all kinds of empty circles and a number of filled circles:

- Empty = reporting address not yet assigned to a reporting person (free)
- Filled = reporter address has already been assigned to a reporter (so busy)
- A blue frame = detector is active, address still free
- A blue-filled detector = address is active and has already been assigned to a detector.
- Red frame = detector has a short circuit
- Yellow frame = address has been assigned to several detectors.

The good thing about this is that you can grab a locomotive, put it on a section and check which address this detector has. You can also see that I use two TM44 modules here. 1 primary and 1 secondary TM44. Because the detectors are numbered continuously you can also find out what the addresses of the blocks are.

Example

Primary module

The detectors 1.1 to 1.4 belong to block address 1.1

The detectors 1.5 to 1.8 belong to block address 1.2

The detectors 1.9 to 1.12 belong to block address 1.3

The detectors 1.13 to 1.16 belong to block address 1.4

Secondary module

The detectors 1.65 to 1.68 belong to block address 1.5

The detectors 1.69 to 1.72 belong to block address 1.6

The detectors 1.73 to 1.76 belong to block address 1.7

The detectors 1.77 to 1.80 belong to block address 1.8

The same also applies to modules 1.0 and 1.1, but then you see the detectors 2.1, 2.2 and so on.

Epilogue

I have written this tutorial for general use. You do not have to pay for this manual and it can be downloaded free of charge on our website. If you want to copy the text for private or club use, please contact us.

Domburg Train Support is an official partner of VPEB and an official reseller of the products. You can also contact Domburg Train Support for advice, support and help at home or via TeamViewer. If this manual does not work with the TM44, please contact us via our website. We have used the photos of the TM44 from the VPEB archive.

I hope this tutorial will help you address the TM44. If you have any comments or remarks, please let me know. I can then process this in a new version. You can report this by sending an email to info@domburgtrainsupport.nl

Thank you for reading and using this manual.

Sincerely,

Martin Domburg