

SPROG-Nano DCC Booster Interface User Guide V4.x firmware



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Introduction

SPROG Nano is a DCC interface for connection between the USB port of a personal computer or similar device and a DCC booster. SPROG Nano transforms a DCC booster into a computer controlled DCC command station by formatting data packets from USB (sent by appropriate software running on the computer) into correctly timed DCC data packets.

SPROG Nano is *not* a decoder programmer, although "ops-mode" or "on-themain" programming is still possible depending on the features of the controlling software.

SPROG Nano is **not** a booster and a separate booster is required between the Nano and the track.

SPROG Nano is supported by JMRI project (<u>http://jmri.sourceforge.net/</u>) which, by use of the java programming language, allows platform independent support of a wide range of DCC hardware. The JMRI software is shareware available as a free download.

Requirements

- DecoderPro from http://jmri.sourceforge.net/ or the CD-ROM (supplied)
- USB A to Mini B cable (supplied)
- DCC booster and power supply with NMRA bipolar input input (supplied by user)

Features

- USB powered no external power supply required for the SPROG Nano
- USB interface for easy connection to PC
- USB activity LED shows communication with the PC
- Cross-platform support Windows, Linux, MAC with appropriate software

Specification/Operating Conditions

Parameter	Minimum	Nominal	Maximum	Units	Note
DCC Output voltage		+/-10V		V	1,2
Operating	0	25		°C	
Temperature Range					

Table 1 Specification/Operating Conditions

Notes:

- 1. DCC output voltage depends upon the load imposed by the booster input(s).
- 2. DCC output is a differential (bipolar in NMRA terminology) signal very similar to that output by a DCC booster but without the current drive capability of a booster

Booster Interface

The DCC output of the SPROG Nano is via the 3-pin pluggable terminal block. The connections are shown in Figure 1 and Table 2.



Figure 1 SPROG Nano Connectors

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Terminal Block Pin	Signal
1	DCC A
2	DCC B
3	0V reference

Table 2 DCC Output Connector

Only two of the three terminals are used to connect to a booster.

The SPROG Nano support both bipolar and unipolar booster interfaces as described in NMRA standard S-9.1.2 Power Station Interface

Bipolar Interface

This uses the DCC A and DCC B signals and is required by some boosters (e.g. Hornby) that require both phases of the DCC signal to function correctly.

This is the generally recommended connection method for the SPROG Nano.

Unipolar interface

This uses either DCC A or DCC B and the 0V reference.

- The 0V of the host PC will be connected to the booster 0V input.
- The 0V connection to the SPROG Nano is intended as a reference only. It is connected to the host PC by the USB cable and must not be relied upon to provide a booster "common" or "home ground".

Installation

The following steps are required to install SPROG Nano before you can use it for the first time:

- Install DecoderPro 3.8 or later
- Install SPROG Nano USB drivers
- Edit DecoderPro preferences
- Connect the booster

This document gives brief installation instructions for the Windows Operating System, versions 2000, XP, 7 and 8, or for MacOS 10.4 and newer. For further instructions and for instructions to install the JRE and DecoderPro on Linux, please refer to the Install Guides on the JMRI website at http://jmri.sourceforge.net/download

Install DecoderPro

DecoderPro should be installed from the CD-ROM or a downloaded copy. The CD includes a recent stable "production" release version.

A newer version of DecoderPro than that supplied on the CD-ROM may be available from the JMRI download page http://jmri.sourceforge.net/download

This user guide assumes you are using version 3.0, or later.

To install from the CD-ROM, browse to the directory specific to your operating system to find the JMRI installer. For example, if your CD-ROM drive is D: on Windows, double click on the file D:\Windows\JMRI.3.x-rxxxxx.exe.

Install SPROG Nano USB drivers

Use the supplied USB cable to connect SPROG NANO to the host computer. The power LED should be lit.

There are four possible choices set out below, for earlier Windows systems, Windows 7, MacOS 10.4 and later, or Linux. Select the right section for your computer and operating system.

Drivers for Windows 2000, XP or Vista (with some variations)

The first time you connect the SPROG Nano you should see the "Found new Hardware Wizard". Follow the steps below to install the SPROG NANO drivers.

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Found New Hardware Wizard			
	Welcome to the Found New Hardware Wizard Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission). Read our privacy policy		
	Can Windows connect to Windows Update to search for software?		
	 Yes, this time only Yes, now and every time I connect a device No, not this time 		
	Click Next to continue.		
	< <u>B</u> ack <u>N</u> ext > Cancel		

Click "No, not this time" then click "Next >".

Found New Hardware Wize	ard
	This wizard helps you install software for: SPROG Nano If your hardware came with an installation CD or floppy disk, insert it now.
	What do you want the wizard to do? Install the software automatically (Recommended) Install from a list or specific location (Advanced) Click Next to continue.
	< <u>B</u> ack <u>N</u> ext > Cancel

Click "Install from a list or specific location" then click "Next >".

Found New Hardware Wizard
Please choose your search and installation options.
Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (floppy, CD-ROM)
✓ Include this location in the search:
E:\Projects\sprog_C\sprogNano\drivers\inf
O Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
< <u>B</u> ack <u>N</u> ext > Cancel

Click "Search for the best driver in these locations" then "Include this location in the search" and then click the Browse button to find the driver directory on the CD-ROM supplied with SPROG NANO.

If your CD-ROM drive is E:\, for example, this directory will be E:\USB\sprogNano\inf

Click "Next >".



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The base drivers are fully compatible with WindowsXP. To make them SPROG Nano specific, the .inf files are edited which, unfortunately, causes this dialogue to appear.

Click "Continue Anyway" and wait for the installation to complete.



Found New Hardware Wizard			
	Completing the Found New Hardware Wizard		
	The wizard has finished installing the software for:		
	SPROG Nano		
	Click Finish to close the wizard.		
	< <u>B</u> ack Finish Cancel		

Click "Finish"

Identify the connection Port

The next step is to ascertain which COM port was assigned to SPROG NANO during the driver installation. Open the System Properties from the Windows Control Panel (you may need to switch to classic view in Control Panel). Alternatively, right click on the Desktop "My Computer" Icon and select Properties.

Select the Hardware tab:

stem Pro	perties 🔹 👔
Syster	n Restore Automatic Updates Remote
General	Computer Name Hardware Advanced
- Device I	Manager
Ż	The Device Manager lists all the hardware devices installed on your computer. Use the Device Manager to change the properties of any device.
	Device Manager
	how Windows connects to Windows Update for drivers. Driver Signing Windows Update
	Driver Signing Windows Update
Hardwar	e Profiles
$ \ge $	Hardware profiles provide a way for you to set up and store different hardware configurations.
	Hardware <u>P</u> rofiles

Click "Device Manager"

🗏 Device Manager 📃	
<u>File Action View H</u> elp	
Keyboards Mice and other pointing devices Mice and other pointing devices	^
Microchip Loois Monitors Hetwork adapters	
Ports (COM & LPT)	
Processors Processors Processors Processors Processors Processors Processors Processors Processors	=
⊕ 😴 System devices ⊕ 😋 Universal Serial Bus controllers	~

Click the "+" to open the Ports (COM & LPT) category and note the COM port assignment for the SPROG NANO (COM9 in this example).

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Your install steps are now all completed, and it is time to start the software and use your SPROG NANO. Go on to the next major section of this Guide "Setting Preferences".

Driver Installation for Windows 7

When the SPROG Nano is first plugged into a USB port you should see a bubble appear in the lower left corner of the screen "Installing device driver – click here for status". If you click then a further status window opens.



Click "Skip..." to skip this step.

Dri	ver So	oftware Installation
	Â	Do you want to skip getting driver software from Windows Update?
		Windows Update provides the latest available driver software which may work better for your device. You can check Windows Update later for the latest driver software. If you skip your device may not function at all.
		<u>Y</u> es No

Click "Yes".



Click "Close"

Open the Device Manager (Start -> Control Panel -> Device Manager) and expand the display of "Other device" where you should see the SPROG Nano:



Point to the SPROG Nano entry and press the Right mouse button. Select "Update Driver Software", or select Properties, and under the Drivers tab, click "Update Drivers".

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Click "Browse my computer for driver software", and then click the Browse button to find the drivers on the CD-ROM supplied with your SPROG NANO. If your CD-ROM drive is D:, for example, browse to the directory D:\USB\sprogNano\inf, as shown:

A DESCRIPTION OF TAXABLE PARTY OF TAXABLE PARTY.	x
G I Update Driver Software - SPROG Nano	
Browse for driver software on your computer	
Search for driver software in this location:	
D:\Projects\sprog_C\sprogNano\drivers\inf	
☑ Include subfolders	
Let me pick from a list of device drivers on my computer This list will show installed driver software compatible with the device, and all driver software in the same category as the device.	
Next	Cancel

Check the "Include subfolders" box.

Click the "Next" button.

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The wizard will take a short time to find and verify the drivers in this location. You will then see a warning window similar to this:

X Windows Security Windows can't verify the publisher of this driver software Don't install this driver software You should check your manufacturer's website for updated driver software for your device. Install this driver software anyway Only install driver software obtained from your manufacturer's website or disc. Unsigned software from other sources may harm your computer or steal information. See details

The base drivers are fully compatible with Windows7, and those supplied on the CD are the latest drivers. To make them SPROG NANO specific, the .inf files are edited which, unfortunately, causes this dialogue to appear.

Click "Install this driver software anyway".

🕞 📱 Update Driver Software - SPROG Nano	
Installing driver software	



Click "Close".

Now return to the Device Manager, and the entry will have changed. The SPROG Nano will be listed under "Ports (COM & LPT)":



Make a note of the COM port assignment (COM9 in the example above) and close the device manager and control panel windows.

Driver installation is now complete, and it is time to start the software and use

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your SPROG NANO. Go on to the next major section of this Guide "Setting Preferences".

Driver Installation for Windows 8

Driver signature enforcement must be disabled to install the drivers on Windows 8 or Windows 8.1. Please refer to the supplementary instructions that can be found on our website <u>http://www.sprog-</u><u>dcc.co.uk/downloads/Win8Installation.pdf</u> or on the CD-ROM supplied with the SPROG Nano.

Driver Installation for MacOS

TBD

Driver Installation for Linux

For Linux, there are many variations of Linux system installations, and variations in installing the USB support will be encountered. For recommendations and many helpful supporters, see the Linux Support pages on the JMRI website.

Setting Preferences

Now start DecoderPro by double clicking the icon that was placed on the Windows desktop during the installation.

Assuming this is the first time that you have started DecoderPro, you will see the DecoderPro main window and the Preferences window.

Main window:

嘴 Decode	🖞 DecoderPro 3: All Entries										
Eile Edit	Ile Edit Settings Actions Window Help										
ID	DCC Addres	s Ico	n Decoder Model	Operator	Number	Manufacturer	Model	Owner	Date Modified		
4MT 80038	80	38	MX62 version 8	BR	80038	Graham Farish		AC	20-May-2012 20:38:51]	
4MT 80097	80	97	MX62 version 8	BR	80097	Graham Farish		AC	21-May-2012 20:59:03		
9F 92100	91	00	MX62_2000	British Railways	92100	Dapol	9F 2-10-0	Andrew	13-May-2012 11:52:08		
testionga		4	MX620 version 9						08-Jun-2012 11:19:19		
UP 997	9	97	BLI F7	Union Pacific	997			Me	20-May-2012 18:17:24		
*											
	ID: Operator: Number: Manufacturer: Owner: Model: DCC ddraes: Program									1	
No Service 1	Mode Drogrammo	Augilah	Decoder Fa Decoder M Filen	mily: odel: ame:		rommor Status - idla				Labels & Media	Throttle

If the Preferences window is not there, Open the Edit -> Preferences dialog from the menu; below is the Preferences window from JMRI 3.0 onwards:

😤 Preferences		
Preferences Connections Defaults File Locations Start Up Display Messages Roster Throttle WiThrottle Web Server	Connection1	
Save	Disable Connection	

Click the arrow in the System manufacturer field and scroll down to select SPROG DCC.

Then in the System connection field, select SPROG Command Station (not SPROG).

Click the arrow in the Serial Port field and select the COM port noted during

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driver installation.

Do not select any other fields at this time. The window should look similar to the example below:

😤 Preferences		. 🗆 🔀
Connections Defaults File Locations Start Up Display Messages	Connection1 Image: Connection1 System manufacturer: SPROG DCC	
Roster Throttle WiThrottle Web Server	System connection:	
	Serial port: SPROG Nano (COM9) Additional Connection Settings	•
Save	Disable Connection	

Click "Save" at the lowest left of the window.

Quit no	w?
?	Your updated preferences will take effect when the program is restarted. Quit now?
	Yes No

Click "Yes". DecoderPro will save the new settings and restart automatically.

Connect the Booster

The booster MUST be isolated from all other DCC command stations and connected only to the SPROG Nano. Damage may result to the
SPROG Nano or other equipment if this rule is not followed.

Connect the SPROG Nano to the booster input using the pluggable terminal block. There is no requirement to observe any particular polarity when connecting the booster.

Getting Started With DecoderPro

See the DecoderPro website <u>http://jmri.sourceforge.net</u> for any updates and latest information.

Join the JMRI Yahoo group <u>http://groups.yahoo.com/group/jmriusers</u> for help from other DecoderPro users and the team who develop it.

Ensure that all software and drivers are installed and that DecoderPro preferences have been setup in accordance with the previous steps.

Start DecoderPro. The main window will open and show the current connection method as "Operations Mode Programmer SPROG Command Station is Online".

嘴 Decoder	rPro 3: All Entries									_ 🗆 🛛
<u>F</u> ile <u>E</u> dit	<u>S</u> ettings <u>A</u> ctions SP	ROG Window He	lp							
P Ne	ew Loco 🔍 Identify	Help								
ID	DCC Address Icon	Decoder Model	Operator	Number	Manufacturer	Model	Owner	Date Modified		
4MT 80038	8038	MX62 version 8	BR	80038	Graham Farish		AC	20-May-2012 20:38:51		
4MT 80097	8097	MX62 version 8	BR	80097	Graham Farish		AC	21-May-2012 20:59:03		
9F 92100	9100	MX62_2000	British Railways	92100	Dapol	9F 2-10-0	Andrew	13-May-2012 11:52:08		
testlonga	4	MX620 version 9						08-Jun-2012 11:19:19		
UP 997	997	BLI F7	Union Pacific	997			Me	20-May-2012 18:17:24		
<u>*.</u>			ID:							
		Oper	ator:					(Programming On I	Main
		Nun	nber:							
		Manufact	urer:					(Edit Only	
		Ov	vner:					Г		
		DCC M	odel:						Program	n
		DCC Add	ess:						riogram	
		Decoder Fa	mily:					L		
		Decoder M	ouel						Labels & Media	Throttle
		Filen	ame.							
No Service N	vlode Programmer Available	Operations Mode F	Programmer SPROG	Command Sta	tion Is Online Pro	grammer St	atus: idle			

Layout Control with SPROG Nano

SPROG Nano Command Station Mode

As well as operating a layout, SPROG Nano can write CVs in operations mode (also known as "on the main" programming) but the contents of CVs cannot be read back.

You may open multiple throttles, one for each loco you wish to control. See below for a note on the limit to the number of locos that can be controlled.

Use the power control in any of the throttles to turn the track power on or off.

An additional feature in Command Station mode is the slot monitor which is accessed from the SPROG menu in the main DecoderPro window

赌 DecoderPro 3: All Entr	ies						_ 🗆 🔀
File Edit Settings Action	ns SPROG Window Help						
	Slot Monitor						
🚽 🕂 New Loco 🔍	Ide Command Monitor						
	Sond Command						
ID DCC Address	Sena Commana	tor Numb	er Manufacturer	Model	Owner	Date Modified	
4MT 80038 8038	Console	80038	Graham Farish		AC	20-May-2012 20:38:51	
4MT 80097 8097	Get SPROG Firmware Version	80097	Granam Farish	05.0.40.0	AC	21-May-2012 20:59:03	
SF 92100 9100	SPROG v3/v4 Firmware Update	Iways 92100	Бароі	9F 2-10-0	Anurew	13-May-2012 11.52.08	
IIP 007 001	SPROG II Firmware Undate	ific 997			Me	20-May-2012 11:13:13	
01 001 001	SDPOG Dower Control	1001	1		Ime	20 may 2012 10.17.24	
	SPRUG Power Control						
	ID.						
	ID: Operatori						
	Operator.					(Programming On Main
	Manufacturor:					(Edit Only
	Owner:						Euromy
	Model						
	DCC Address:						Program
	Decoder Family:						
	Decoder Model:						Labels & Media Throttle
	Filename:						Labora de modula
No Service Mode Programmer A	vailable Operations Mode Programmer	SPROG Command	Station Is Online Pr	grammer St	atus: idle		

The top portion of the slot monitor contains a checkbox to control whether unused slots are displayed, a button to force an emergency stop of all locos and the output current being supplied by the SPROG Nano.

The output current reading will not be valid for SPROG Nano.

The remainder of the slot monitor is the list of slots, at least one slot is associated with each throttle (see below).

赌 SP	ROG Slot I	Monitor									
	Show unused slots estop all Track Current: 0.0										
Slot	Address	Speed	U	lse	Dir						
0	997	29	In Us	е	Rev						
1	54	84	In Us	е	Fwd						
2	0	0	Free		Fwd						
3	0	0	Free		Fwd						
4	0	0	Free		Fwd						
5	0	0	Free		Fwd						
6	0	0	Free		Fwd						
7	0	0	Free		Fwd						
8	0	0	Free		Fwd						
9	0	0	Free		Fwd						
10	0	0	Free		Fwd						
11	0	0	Free		Fwd						
12	0	0	Free		Fwd						
13	0	0	Free		Fwd						
14	0	0	Free		Fwd						
15	0	0	Free		Fwd						

In this example, a loco with address 997 is running in reverse at speed step 29 and a loco with address 54 is running forwards at speed step 84

When you use a function button on a throttle, you will see an extra slot occupied momentarily with the address of the loco on that throttle and speed 0. This indicates that the function command is being sent to the loco. To allow for errors in reception, function commands are repeated three times. After the third copy is sent, the slot will be cleared.

Short (one byte) Versus Extended (two byte) Addressing

The DCC specification allows two forms of loco address:

- Short addresses in the range 1 127
- Extended addresses in the range 1 10239

Most DCC system impose their own arbitrary limits on these address ranges. In SPROG Command Station mode the allowable address ranges are:

- Short addresses 1 127
- Long addresses 128 10239

How Many Locos Can Be Controlled?

Sixteen slots are available for simultaneous control of multiple locos. Other locos may be parked on the layout.

Some slots should always be left free for sending function control commands. These free will be shared between throttles as required, it is not necessary to have a free slot for every throttle.

Determining the SPROG Nano Firmware Version

Select "Get SPROG Firmware Version" from the SPROG menu

😤 DecoderPro 3: All Entries									_ 🗆 🛛
File Edit Settings Actions	SPROG Window Help								
New Loco	Slot Monitor Command Monitor								
ID DCC Address	Send Command	tor	Number	Manufacturer	Model	Owner	Date Modified		
4MT 80038 8038	Console	101	80038	Graham Farish	wouer	AC	20-May-2012 20:38:51		
4MT 80097 8097	Get SDBOG Eirmware Version		80097	Graham Farish		AC	21-May-2012 20:59:03		
9F 92100 9100		ways	92100	Dapol	9F 2-10-0	Andrew	13-May-2012 11:52:08		
testlonga 4	SPROG v3/v4 Firmware Update						08-Jun-2012 11:19:19		
UP 997 997	SPROG II Firmware Update	ific	997			Me	20-May-2012 18:17:24]	
	SPROG Power Control								
1									
	ID:								
	Operator:						(Programming On I	lain
	Number:								a dan a
	Manufacturer:						(Edit Only	
	Owner:						Г		
	Model: DCC Addrose:							Program	
	Decoder Family								
	Decoder Model						[Labala & Madia	Throttlo
	Filename:							Laneis & Media	Infottie
No Service Mode Programmer Avai	lable Operations Mode Programmer :	SPROG	Command Stat	tion Is Online Pro	orammer St	atus : idle			

The SPROG Nano firmware version will be displayed in a new window.



Click "OK" to close the window.

The SPROG Console

The SPROG console allows optional SPROG features to be enabled and disabled. Select the SPROG Console from the SPROG menu

📇 Decoder	Pro 3: All Entries									
File Edit	Settings Actions	SPROG Window Help								
		Slot Monitor	1							
🖉 🕂 Ne	ew Loco 🛛 🔍 Ide	Command Monitor								
		Command Monitor								
ID	DCC Address	Send Command	tor	Number	Manufacturer	Model	Owner	Date Modified		
4MT 80038	8038	Console	_	80038	Graham Farish		AC	20-May-2012 20:38:51		
4MT 80097	8097	Get SPROG Firmware Version		80097	Granam Farish	05.3.40.0	AC	21-May-2012 20:59:03		
9F 9Z100	9100	SPROG v3/v4 Firmware Update	iways	92100	Барог	9F Z-10-0	Anurew	13-May-2012 11.52.08		
UP 997	997	SPROG II Firmware Update	ific	997			Me	20-May-2012 18:17:24		
	501	SPROG Power Control		1			1		1	
		STROOP OWER CONTO								
A										
		ID:								
		Operator:								
		Number:						(Programming On I	Main
		Manufacturer:						(Edit Only	
		Owner:								
		Model:								
		DCC Address:							Program	1
		Decoder Family:								
		Decoder Model:							Labels & Media	Throttle
		Filename:						L		
No Service M	tode Programmer Avai	lable Operations Mode Programmer :	SPROG (Command Stat	tion Is Online Pro	orammer St	atus : idle			

A typical console display is shown below. Some features may not be available, depending upon the firmware version of the SPROG Nano.

赌 Sprog Console -	Connected to SPROG Nano 1.0	_ 🗆 🗙
Window Help		
Command History		
cmd: "M"		
rep:"M=h0800		
P>"		
	Clear screen Freeze screen Show raw data Show timestamps Window always on Top	
	Choose log file Start logging Stop logging	
Add Message		
Send Command		
	Command: Send	
-Speed Step Mode fo	or SPROG Throttle	
	🔾 14 step 🛛 28 step 🖲 128 step	
Configuration		
	Constant Limit (mit)	
-Save/Load Configur	ation	
	Savo	
	2046	

Title Bar

The title bar includes the type and firmware version of the connected SPROG Nano, e.g SPROG Nano v1.0.

Command History

The command history pane provides the same functionality as the basic Command Monitor (available on the SPROG menu) and captures commands to and replies from the SPROG Nano. The history may be saved to a file on the computer by first choosing a log file and then selecting "Start logging". The command history can be useful in diagnosing problems encountered in using the SPROG Nano. The "Add Message" field can be used to add annotations to the command history.

Send Command

The "Send Command" field provides the same functionality as the basic Send command utility available on the SPROG menu. Enter a command in the Command field and press return on the keyboard or click the send button to send the command to the SPROG Nano.

Selecting SPROG Operating Modes

After changing any of the following modes, you should use the "Save" button to store the changes in the SPROG Nano.

Speed Step Modes

Not applicable for SPROG Nano.

Current Limit

Not applicable for SPROG Nano.

Set ZTC Mode

Not applicable for SPROG Nano.

Set Blueline Mode

Not applicable for SPROG Nano.

Unlock Firmware

Select this option if you are about to update the SPROG Nano firmware using the bootloader. This mode is automatically canceled when the power is removed from the SPROG Nano.

Save

Always click this button after selecting a new mode. The selected modes (apart from "Unlock Firmware") will be stored in the SPROG Nano, so that they are effective each time you use your it, even after the power has been removed.

Updates to the SPROG Nano Firmware

The "firmware" is the small computer program that runs on the microprocessor at the heart of the SPROG Nano. Occasionally it may become necessary to update the SPROG Nano firmware to add new features or fix bugs.

The SPROG DCC philosophy is that all versions of our products are totally forwards and backwards compatible and that any new features and bug fixes for a particular product are made available to all existing users.

The firmware can be updated by returning your SPROG Nano to SPROG-DCC (or appointed representative) or by using the "bootloader" (see below).

Returning Your SPROG Nano for Update

If you prefer, contact us to discuss returning your SPROG Nano for update. This is usually free of charge but return postage is always appreciated.

Firmware Update Using the Bootloader

The "bootloader" is a feature of the SPROG Nano that allows new firmware to downloaded via the normal USB connection.

Download the new firmware (if available) as a .hex file from the SPROG-DCC website and save it in a convenient place on your computer.

If the bootloader download is interrupted for some reason (e.g. if power or

USB connection are removed), the SPROG Nano may be left in an

unusable state. In this case it will need to be returned for repair.

Follow the step-by-step instructions to download the new firmware:

- 1. Open the SPROG console in DecoderPro (see "The SPROG Console").
- 2. Tick the "Unlock firmware" selection by clicking with the mouse.
- 3. Click "Save" and close the Console.
- 4. Select the "SPROG II/SPROG 3 Firmware Update" utility from the SPROG menu.

🖹 DecoderPro 3: All Entries					
tor Number Manufactu 80038 Graham Far 80097 Graham Far ways 92100 Dapol ific 997	Irer Model Owner Date Modified ish AC 20-May-2012 20:38:51 1 ish AC 21-May-2012 20:38:51 1 9F 2-10-0 Andrew 13-May-2012 12:02:08 08-Jun-2012 11:52:08 08-Jun-2012 11:19:19 08-Jun-2012 11:52:08 08-Jun-2012 11:52:08 Me 20-May-2012 18:17:24				
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	or Number Manufactu 80038 Graham Far 80097 Graham Far ways 92100 Dapol fic 997	Or Number Manufacturer Model Owner Date Modified 80038 Graham Farish AC 20-May-2012 20:38:51 80097 Graham Farish AC 21-May-2012 20:39:03 ways 92100 Dapol 9F 2-10-0 Andrew 13-May-2012 11:52:08 mays 92100 Dapol 9F 2-10-0 Andrew 13-May-2012 11:52:08 ifc 997 Me 20-May-2012 18:17:24			

Click "Update" if you have the new firmware file available and are ready to proceed.

SPROG II Firmware Update 🛛 🔀			
In order to proceed with a SPROG II firmware updateYou must have a valid .hex firmware update file Are you certain you want to update the SPROG II firmware?			
	Cancel Update		

Click "Connect"

赌 SPROG Firmware Update		_ 🗆 🔀		
Help				
Connect	Choose hex file	Program		
	Set SPROG Mode			
		_		

Click "Choose hex file" and navigate to the directory where you saved the downloaded .hex file.



Open the firmware file.

😤 Open					
Look <u>i</u> n: 📑 n	nano_1_	.0	-	a 6 6	
📑 src		🗋 commands.c	🗋 isr.h	🗋 nan	o_1_0.mc
📑 tmp		🗋 commands.h	🗋 main.c	🗋 nan	o_1_0.mc
📑 USB2.9a_c	:dc	🗋 HardwareProfile.h	🗋 main.h	🗋 nan	o_1_0.mc
📑 usbios		🗋 io.c	🗋 nano_1_0.co	of 🛛 🗋 nan	o_1_0.mp
bootloader	.c	🗋 io.h	🗋 nano_1_0.he	ex 📄 nan	o_1_0.tag
bootloader	.h	🗋 isr.c	🗋 nano_1_0.m	iap 📄 spro	og.c
•					•
File <u>N</u> ame:	nano_1	_0.hex			
Files of <u>T</u> ype:	All Files	\$			•
				Open	Cancel

Click "Program"



First the old firmware will be erased, and then the new firmware will be written. Progress is reported in the status line of the window. If the Console is still open, you will also see the messages flowing between the computer and the SPROG Nano.

You may see a pause in activity with the message "Erase Complete". This is

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Version 4.1 Aug 2015
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normal, do nothing at this point, the software is calculating where to begin writing the new firmware.

嘴 SPE	ROG Fi	irmware Upda	te 📃		
Window Help					
	Choose hex file		Program		
		Set SPROG Mode			
Erase Complete					

When "Write Complete" is displayed, click "Set SPROG Mode".

嘴 SPF	ROG Fi	irmware Upda	te 📃	
Window Help				
	Choose hex file		Program	
Set SPROG Mode				
Write Comple				

Close the window and the firmware update is complete.

Connecting SPROG Nano to SBOOST Boosters

Example 1

SPROG Nano driving multiple SBOOST with common power supply.

The power supply must be able to supply the full rated current (e.g., at least 5 Amp for 2 x SBOOST).

Power districts must be separated by isolation gaps in both rails.



Example 2

SPROG Nano driving multiple SBOOST with separate power supplies.

Each power supply should be the same voltage.

Each power supply must be able to supply the full SBOOST rated current, i.e. at least 2.5 Amp.

A common ground connection is required between the power supplies, as shown in the diagram below.

Power districts must be separated by isolation gaps in both rails.



Connecting SPROG Nano to Other boosters

It is recommended that you use boosters with an opto-isolated input.

The following boosters have opto-isolated inputs, and have been tested with SPROG Nano:

Hornby Tam Valley Depot DCC Booster Roco 10764 Lenz LV102

The following boosters have opto-isolated inputs, and should work, but have not yet been tested with SPROG Nano:

Bachmann Optional on Digitrax

Troubleshooting

Before reporting any problems please check the SPROG DCC homepage for any bug reports or updates. There is a SPROG DCC FAQ page which will be updated to reflect the most common questions people have about SPROG.

One common problem is the configuration of the "Virtual COM Port" for SPROG Nanos. Please review the information in the section "Edit DecoderPro Preferences".

If you have problems please use the SPROG console (found under the SPROG menu in DecoderPro), recreate the problem and send the output of the command monitor to sprog@sprog-dcc.co.uk with a description of the problem.

Useful Links

SPROG homepage <u>http://www.sprog-dcc.co.uk</u> for the latest information, updates, downloads, etc., for SPROG Nano.

SPROG DCC Yahoo group <u>http://groups.yahoo.com/group/sprog-dcc</u> for help from other SPROG users.

Java Model railroad Interface http://jmri.sourceforge.net for DecoderPro.

JMRI Users Yahoo group <u>http://groups.yahoo.com/group/jmriusers</u> for user community help with DecoderPro.

References

NMRA S-9.1.2 Power Station Interface http://www.nmra.org/sites/default/files/standards/sandrp/pdf/S-9.1.2_2012_07.pdf