# PROGRAMMING DCC



NMRA Prototype Rails 2018

Cocoa Beach, FL

### MATERIALS AND HANDOUTS

### http://www.dccgeek.com/downloads.html

### WHAT IS JMRI?

- JMRI stands for Java Model Railroad Interface
- JMRI is an open source program for model railroad hobbyists
- JMRI is a Program Suite, consisting of:
- DecoderPro® A better tool for programming decoders, simplifying the job of configuring DCC decoders from your computer
- PanelPro<sup>™</sup> Design and Operate CRT based CTC control panels that reflect the real-time state of your railroad and let you control it
- **DispatcherPro** A system for Dispatching, grouping your Roster and Throttles
- **OperationsPro™** Build Trains from your Roster and print Train Manifests that detail the work your train crews will perform
- AudioPro A set of tools for using Audio with JMRI

### TO USE JMRI YOU'LL NEED:

- A COMPUTER RUNNING WINDOWS, OR LINUX (VARIOUS TYPES ARE SUPPORTED)
- JAVA
- A DCC SYSTEM OR A SPROG (<u>HTTP://WWW.RR-CIRKITS.COM</u>)
- A COMPUTER INTERFACE FOR YOUR DCC SYSTEM

### WHERE TO GET JMRI SOFTWARE?

#### Go to: http://jmri.sourceforge.net

#### ☆ 🚳 🧄 🔽 🛃 : ← C 🟠 🛈 jmri.sourceforge.net search JMRI: JMRI® is... What is JMRI? **DecoderPro**® A better tool for programming decoders, The JMRI project is building tools for model railroad computer control. We want it to be usable to as many people as possible, so we're building it in Java to simplifying the job of run anywhere, and we're trying to make it independent of specific hardware systems. configuring DCC decoders from your computer JMRI is intended as a jumping-off point for hobbyists who want to control their layouts with a computer without having to create an entire system from scratch. **PanelPro**™ You can manage your locomotive rosters and easily program your decoders using DecoderPro@. You can build control panels and control your layout using Design and Operate CRT PanelPro<sup>TM</sup> to set up signaling. OperationsPro<sup>TM</sup> lets you create manifests that route cars across your railroad from shipper to receiver, and provide train based CTC control panels crews with operating instructions. that reflect the real-time state of your railroad and Going beyond the basics, you can use Logix to automate your layout's behavior, interface with X10 and Insteon systems to control your layout room's lights let you control it and write scripts to extend the capabilities of the system. As an open source project, JMRI is evolving in many directions at once. You can get involved at many levels: DispatcherPro · Learn about JMRI (check out the online help, DecoderPro manual, FAQs and Clinics) A system for Dispatching, · Kick the tires (download JMRI, install it on Windows, Mac OS X or Linux, connect it to your layout) grouping your Roster and · Share your experiences with others (join or browse the JMRI Users Yahoo Group) Throttles Help extend and develop it (look under the hood, get the source code, join or browse the JMRI-Developers mailing list) Or make a small donation to help defray the costs of keeping this going. **OperationsPro**<sup>™</sup> Whatever it is that you choose to do with JMRI, and however you get involved, welcome to our community! Build Trains from your Roster and print Train Manifests that detail the work your train crews will perform JMRI 4.10 Production Release JMRI 4.11.1 Test Release Released on December 19, 2017. Released on December 24, 2017. SoundPro JMRI 4.10 is recommended for new users. It's the most recent stable production release. This is the first in a series working toward the next JMRI production release 4.12 in early A set of tools for using summer 2018. Audio with JMRI For more information, please read the JMRI 4.10 Release Note, which also contains the download links For more information on this test release, please read the JMRI 4.11.1 Release Note, which also contains the download links. Cool Uses People have used JMRI to JMRI 3.10.1 Production Release Release 4.10 is the current "production" release, recommended for first-time users. do some great things for Released on January 11, 2015. the model railroad community JMRI 3.10.1 is recommended for JMRI users with computers that can only run Java 1.6; Our Gallery page later releases require Java 1.8. highlights some of these. For more information, please read the JMRI 3.10.1 Release Note, which also contains the download links Tools JMRI provides powerful tools for working with JMRI 2.14.1 Production Release your layout. Released on July 15, 2012. Turnouts Lights JMRI 2.14.1 is recommended for JMRI users with computers that can only run Java 1.5:





Configure: Atlas Commander via Lenz LI100, LI101F, LIUSB or GenLi XPressNet interfaces, ZTC Controls ZTC640 interface, or an XPA and Hayes compatible modem

Note: you can not program decoders with this configuration.

Bachruse

**Bachrus** 

Configure: Bachrus MTS-DCC Model Train Speedometer

<u>C/MRI</u> C/MRI

> Configure: <u>Bruce Chubb's C/MRI control system</u> for a connection via direct serial, <u>USB-</u> serial adapter, or network connection.

Model Railroading for the 21<sup>st</sup> Century

CTI Electronics Acela Configure: CTI Electronics boards





Configure: EasyDCC command station via Serial or Terminal Server

DCC++

Configure: DCC++ Open Source Arduino Command Station.



Configure: <u>Hare, Wabbit, Block Watcher or PSX family products</u>.



General information on connecting to a Digi XBee network





General information on connecting JMRI to a Digitrax LocoNet

Configure: Connections to a LocoNet via

- Digitrax PR3 interface
- <u>RR-CirKits LocoBuffer-USB</u>
- The older LocoBuffer-II, LocoBuffer and MS100 interfaces
- Bluetooth LocoBridge

Configure: LocoNet Simulator for use when disconnected from a layout.

Configure: Remote connection to a LocoNet via <u>JMRI LocoNet Server</u>.

Configure: Remote connection to a LocoNet via LbServer.

More information on connecting multiple computers to a single LocoNet

Configure: Programming and testing decoders without a command station via a <u>Digitrax PR2</u> interface or <u>PR3 interface</u>.

Configure: Directly connecting to an Intellibox.



Configure connection to **ECoS** command station.



Fleischmann

Configure: Twin Centre communications (LocoNet)



Configure: Hornby Elite via built in USB Port

Configure: Hornby Elite or Hornby Select via Lenz LI100, LI101F, LIUSB or GenLi XPressNet interfaces, ZTC Controls ZTC640 interface, or an XPA and Hayes compatible modem.

Please check the notes above for system specific restrictions on what JMRI can do.



Configure: <u>Lenz LI100, LI101F, LIUSB or GenLi XPressNet interfaces, ZTC Controls ZTC640 interface,</u> or an XPA and Hayes compatible modem.

Please check the notes above for system specific restrictions on what JMRI can do.



Connection: Serial cable

Configure: TMCC Command Base





Maple Systems touch panel

Configure: connection via serial link



Configure connection to <u>CS2</u> Command Station 2.

CS Command Station - see ESU ECoS



Configure: MERG CBUS networks



Configure: Modbus networks





m-RPS

NAC Services RPS

<u>Configure connection</u> to an RPS position detection system.



Configure connection to a Powerhouse Pro via <u>serial link</u> or <u>Terminal Server</u>. Configure connection to a PowerCab via <u>NCE USB adapter</u>.

Out Tree Systems

Configure connection to <u>Oak Tree's Railroad Control Interface (RCI)</u>, including the IO-24, IO-48 and O-48 interface cards and HH-2 handheld throttle. (Note: RCI is to be replaced by <u>Layout Control System (LCS)</u>)



Configure: OpenLCB networks



Configure: Grapevine nodes



QSI Solutions.com

**Connection: Quantum Programmer** 

Configure: USB connection

QSI decoders can be programmed with DecoderPro through any DCC system. JMRI can't load sounds into QSI decoders.

RailDriver PI Engineering RailDriver

Configure: RailDriver cab simulator



General information on connecting to the Raspberry PI GPIO pins.



Configure: Roco LocoMaus 2 (Roco Part number 10760), Roco MultiMaus (Roco Part number 10810), or Roco multiZENTRAL-Pro (Roco Part number 10830) via Lenz L1100, L1101F, L1USB or GenLi XPressNet interfaces, ZTC Controls ZTC640 interface, or an XPA and Hayes compatible modem.

Please check the notes above for system specific restrictions on what JMRI can do.



SPROG DCC

**SPROG** 

Configure: SPROG as either a stand-alone DCC programmer or DCC command station



Configure: Connection to SRCP server



Configure connection to TAMS Master Control command station.



**Uhlenbrock** 

The Intellibox can be connected to JMRI programs either via a LocoNet connection, or via its own built-in serial (RS232) port or USB connection.

Configure: Uhlenbrock Intellibox-I or -II via LocoNet interface

Configure: Uhlenbrock Intellibox-I via built-in serial port

Configure: Uhlenbrock Intellibox-II via built-in USB connection

Configure: System One





 Viessmann <u>Viessmann</u> (XPressNet)
 Configure: Viessmann Commander via <u>Lenz LI100, LI101F, LIUSB or GenLi XPressNet interfaces, ZTC Controls ZTC640</u> interface, or an XPA and Hayes compatible modem.

Please check the notes above for system specific restrictions on what JMRI can do.

Wangrow Wangrow

**Connection: Wangrow Serial Port** 

<u>X10</u> <u>X10</u>

Connection: X10, Insteon power-line controllers

Configure: CM11, 2412S and compatible controllers.





Configure: ZIMO MX-1



Configure: ZTC Controls ZTC511, ZTC Controls ZTC521 via <u>Lenz LI100, LI101F, LIUSB or GenLi</u> <u>XPressNet interfaces, ZTC Controls ZTC640 interface, or an XPA and Hayes compatible modem</u> (requires XPressNet V3.0 software).

Please check the notes above for system specific restrictions on what JMRI can and cannot do.

### COMMON DCC PROGRAMMING TERMS

- CV Configuration Variable: DCC Decoder settings for motor control, lighting effects, consisting controls and sound effects (a cv is something you can adjust – a setting)
- Address: the DCC decoder's ID number. To access the locomotive /mobile decoder, you enter the address in the DCC throttle / system
- Service Mode Programming: programming with feedback / acknowledgement from the decoder. This is done on a isolated programming track. This is address- independent
- OPS Mode Programming: programming on the MAIN LINE track; no feedback is available to the programming software / hardware. OPS mode programming requires accessing the locomotive /mobile decoder via the decoder's ADDRESS.

### SOME RECOMMENDATIONS

- Test Track setup a loop of track 22" minimum radius if you do not have a layout; higher if needed
- Separate / Isolated Programming Track use this section of track for PAGE mode and DIRECT mode programming
- Locomotive Roster Database ? USE JMRI DecoderPro! DecoderPro's database makes a great roster database (we'll show how)
- Purchase a decoder tester test and configure your decoder before you install it in your locomotive or rolling stock
- Join DCC Yahoo Groups lots of help and documents on DCC and Programming

### **DECODER TESTERS**



NCE





CS

**ESU** 

### LETS GET STARTED:

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File Edit Settings Actions	s LocoNet Win	dow H	Help						
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ID	DCC Address	Icon	Decoder Model	Road Name	Pood Number	Monufacturor	Model	Ownor	
AMTK 901 AEM7 FL4	901		FL4	Amtrak	lleo typic	ally Diroc	+ Byte	or Page	
Athearn Genesis USRA 2-8-2	3		1617 - HO Scale - Light Steam - Universal		Ose Typic	uny Direc	Dyle	; or ruge	<b>5</b> 0 4
ATSF 9822 RSD-15 DH126	9822		DH126PS	Santa Fe	9822	Digitrax DH126	Alco R	Hugo Sacco	Oct 10,
ATSF 9822 RSD-15 BLI Sou	9822		Diesel	Santa Fe	9822	BLI BlueLine	Alco R	Hugo Sacco	Oct 10,
SCL 1020 EMD GP9 CM	1020		QSI Revolution Diesel	Seaboard Co	. 1020	Athearn	EMD G	Carl Marchand	Sep 26
SCL 1036 GP9 Titan CM	1036		FX-U F3 EMD567	Seaboard Co	. 1036	Athearn Genesis	EMD G	Carl Marchand	Sep 26
SCL 1252 RS3 Atlas CM	1252		Four Function Dual Mode	Seaboard Co	. 1252	Atlas Classic	ALCO	Carl Marchand	Nov 1, :
SCL 1407 GP35 CM	1407		LL110LC Diesel	Seaboard Co	. 1407	Athearn RTR	EMD G	Carl Marchand	Oct 7, 2
SCL 1413 GP35 DH165A0	1413		DH165A0	Seaboard Co	. 1413	Athearn RTR	EMD G	Carl Marchand	Nov 16
SCL 1413 GP35 SFX004 CM	1413		SFX004	Seaboard Co	. 1413	Athearn RTR	EMD G	Carl Marchand	Nov 16
SCL 1413 GP35 Tsunami	1413		TSU-GN1000 EMD 567	Seaboard Co	. 1413	Athearn RTR	EMD G	Carl Marchand	Nov 18
SCL 1415 GP35 DP5X	1415		DP5X	Seaboard Co	. 1415			Carl Marchand	Nov 19
SCL 1651 GP40-2 CM	1651		GP40-2	Seaboard Co	. 1651	Athearn Genesis	EMD G	Carl Marchand	Sep 26
SCL 309 F9A CM	309		F9	Seaboard Co	. 309	Athearn Genesis	EMD F9A	Carl Marchand	Jan 5, 1
SCL 399 F7B CM	399		F7	Seaboard Co	. 399	Athearn Genesis	EMD F7B	Carl Marchand	Nov 29
SCL 405 EMD F7A CM	405		F7	Seaboard Co	. 405	Athearn Genesis	EMD F7A	Carl Marchand	Dec 5,
Seaboard 4028 F3 PH2	4028		AT100LC/KT100LC Diesel	Seaboard Air	4028	Athearn Genesis	EMD F3	Carl Marchand	Oct 8, 2
SOU 3923 U23B Mike_S	3923		D13SRJ	Southern RR	3923	Atlas	GE U3	Mike Sewell	Oct 10,
SOU 3923 U23B Mike_S	1654		LokSound Select Alco 244	Seaboard Air	1654	Athearn RTR	Alco R	Carl Marchand	Oct 10,
SOU 3982 B23-7 Mike S	3982		D13SRJ	Southern RR	3982	Atlas	GE B23	Mike Sewell	Oct 10,

#### Your Locomotive Roster

	ID:	SCL 309 F9A CM			Programming Tra	ck
Roster Photo	Road Number:	Seaboard Coast Line			O Programming On	Main
18 2000	Manufacturer:	Athearn Genesis			EditOnly	
Constitution of	Owner:	Carl Marchand				
TEAFORTO S	DCC Address:	309			Program	n
A CONTRACTOR OF THE OWNER OF THE	Decoder Family:	Tsunami Diesel Genesis	S OEM			
	Decoder Model: Filename:	F9 SCL 309 F9A CM.xml			Labels & Media	Throttle
Service Mode Programmer LocoNet Is Online	Operations Mode Pro	grammer LocoNet Is Online	Programmer Status: idle	Active Profile: My JMRI Railroad		

#### PAGED VS DIRECT MODE PROGRAMMING

#### PAGED MODE

- Paged Mode introduced the term "<u>CV</u>" (Configuration Variable).
- It is very slow when reading back the CVs.
- To read a CV, a number is sent to the decoder. If the response is negative, the number is incremented by one, and the process repeats until a positive response is received from the decoder. This process can repeat up to 256 times.
- Reading the complete CV set of a decoder will take a long time. Every CV will be tested sequentially in this manner.

#### DIRECT MODE

- The popularity of Direct Mode is increasing all the time. It is a very fast mode of programming. The <u>NMRA</u> would like to replace Paged Mode programming with **Direct Mode**.
- Faster Readback of CVs
- Instead of asking "Is it 1?, Is it 2?", Direct Mode takes a different approach.
- It asks if Bit 1 of the CV is set. Then "Is Bit 2 set?"
- INSTEAD OF MAKING UP TO 256 INQUIRES TO DETERMINE THE VALUE OF A CV, IT CAN DO IT WITH EIGHT. IT CAN READ THE ENTIRE DECODER'S CVS VERY QUICKLY.

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🚆 DecoderPro: All Entries								- 0	×
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ID	DCC Address	Icon	Decoder Model	Road Name	Road Number	Manufacturer	Model	Owner	
AMTK 901 AEM7 FL4	901		FL4	Amtrak	901	Train Control S	FL4	Carl Marchand	Oct 27,
Athearn Genesis USRA 2-8-2	3		1617 - HO Scale - Light Steam - Universal					Carl Marchand	Dec 14
ATSF 9822 RSD-15 DH126	9822		DH126PS	Santa Fe	9822	Digitrax DH126	Alco R	Hugo Sacco	Oct 10,
ATSF 9822 RSD-15 BLI Sou	9822		Diesel	Santa Fe	9822	BLI BlueLine	Alco R	Hugo Sacco	Oct 10,
SCL 1020 EMD GP9 CM	1020		QSI Revolution Diesel	Seaboard Co	. 1020	Athearn	EMD G	Carl Marchand	Sep 26
SCL 1036 GP9 Titan CM	1036		FX-U F3 EMD567	Seaboard Co	. 1036	Athearn Genesis	EMD G	Carl Marchand	Sep 26
SCL 1252 RS3 Atlas CM	1252		Four Function Dual Mode	Seaboard Co	1252	Atlas Classic	ALCO	Carl Marchand	Nov 1,
SCL 1407 GP35 CM	1407		LL110LC Diesel	Seaboard Co	. 1407	Athearn RTR	EMD G	Carl Marchand	Oct 7, 2
SCL 1413 GP35 DH165A0	1413		DH165A0	Seaboard Co	. 1413	Athearn RTR	EMD G	Carl Marchand	Nov 16
SCL 1413 GP35 SFX004 CM	1413		SFX004	Seaboard Co	. 1413	Athearn RTR	EMD G	Carl Marchand	Nov 16
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SCL 1415 GP35 DP5X	1415		DP5X	Seaboard Co	. 1415			Carl Marchand	Nov 19
SCL 1651 GP40-2 CM	1651		GP40-2	Seaboard Co	1651	Athearn Genesis	EMD G	Carl Marchand	Sep 26
SCL 309 F9A CM	309		F9	Seaboard Co	. 309	Athearn Genesis	EMD F9A	Carl Marchand	Jan 5, 1
SCL 399 F7B CM	399		F7	Seaboard Co	. 399	Athearn Genesis	EMD F7B	Carl Marchand	Nov 29
SCL 405 EMD F7A CM	405		F7	Seaboard Co	405	Athearn Genesis	EMD F7A	Carl Marchand	Dec 5,
Seaboard 4028 F3 PH2	4028		AT100LC/KT100LC Diesel	Seaboard Air	4028	Athearn Genesis	EMD F3	Carl Marchand	Oct 8, 2
SOU 3923 U23B Mike_S	3923		D13SRJ	Southern RR	3923	Atlas	GE U3	Mike Sewell	Oct 10,
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SOU 3982 B23-7 Mike_S	3982		D13SRJ	Southern RR	3982	Atlas	GE B23	Mike Sewell	Oct 10,



### COMMON CVs aka – CV First Aid Kit

CV	DEFINITION
CV1	Short Address (1-127); not to be confused with a CONSIST ADDRESS
CV2	Start voltage - set the voltage needed to move the loco at Speed Step 1
CV3	Acceleration Rate (Momentum) 7mS delay/per unit between Speed Steps (typically 1-255)
CV4	Deceleration Rate (Momentum) 7mS delay/per unit between Speed Steps (typically 1-255)
CV5	Vmax – Maximum Speed Setting
CV6	Vmid – Middle Speed Setting
CV8	Reset for many decoders CV8=8 to reset
CV19	Advanced Consist Address – NOTE: set to zero to clear the consist
CV29	The BIG one! – key settings made here (we'll cover separately)
CV30	Reset for some decoders CV30=2 to reset

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File Poset Window Help	
Analas Cantala Consist Advanced Cound Cound Louds City Envelope Devet ASC	
Analog Controls Consist Advanced Sound Sound Levels CVS Equalizer Reverb ASC	1
	1
Road Name: Seaboard Coast Line	r
Road Number: 309	
Manufacturer: Athearn Genesis	
Owner: Carl Marchand	
Model: EMD F9A	
DCC Address: 309 DCC Long 🔻	
Throttle Speed Limit (%): 100 -	
Comment: sing Speed Table: CV25=10 CV29 =50 CV66=120 CV95=120	
Decoder Family: Tsunami Diesel Genesis OEM	
Decoder Model: F9	
Date Modified: Jan 5, 2016 12:20:44 PM	
Save to Roster Reset to defaults	
The programming window and tabs are brand specific	
Read changes on all sheets         Write changes on all shee         Read all sheets         Write all shee	
Programming Mode Direct Byte 💌	

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### WHAT CV29 CONTROLS

NO DC / analog – DCC Only

#### DC / analog and DCC Operation

#### CV #29 Table

Analog	Speed steps	Direction	When address is 1-127	When address is 128-9999
disable	28	normal	CV29=2 (default)	CV29=34 (default)
disable	28	reverse	CV29=3	CV29=35
disable	14	normal	CV29=0	CV29=32
disable	14	reverse	CV29=1	CV29=33
enable	28	normal	CV29=6	CV29=38
enable	28	reverse	CV29=7	CV29=39
enable	14	normal	CV29=4	CV29=36
enable	14	reverse	CV29=5	CV29=37



28 Speed Steps – extended to 128 Speed Steps in newer decoders 14 Speed Steps – outdated use only on OLD systems

#### CV #29 Table

Analog	Speed steps	Direction	When address is 1-127	When address is 128-9999
disable	28	normal	CV29=2 (default)	CV29=34 (default)
disable	28	reverse	CV29=3	CV29=35
disable	14	normal	CV29=0	CV29=32
disable	14	reverse	CV29=1	CV29=33
enable	28	normal	CV29=6	CV29=38
enable	28	reverse	CV29=7	CV29=39
enable	14	normal	CV29=4	CV29=36
enable	14	reverse	CV29=5	CV29=37



Normal Direction of Travel (think RS3 long hood forward) Reverse Normal Direction of Travel (RS3 SHORT hood forward)

#### CV #29 Table

Analog	Speed steps	Direction	When address is 1-127	When address is 128-9999
disable	28	normal	CV29=2 (default)	CV29=34 (default)
disable	28	reverse	CV29=3	CV29=35
disable	14	normal	CV29=0	CV29=32
disable	14	reverse	CV29=1	CV29=33
enable	28	normal	CV29=6	CV29=38
enable	28	reverse	CV29=7	CV29=39
enable	14	normal	CV29=4	CV29=36
enable	14	reverse	CV29=5	CV29=37

Analog Controls	Consist	Advanced	Sound	Sound Levels	CVe	Faualizer	Reverb	ASC	1		
Roster Entry	Ba	isic M	Motor	Basic Spe	ed Contro	ol	Speed	Table	Function	n Map	Lights
			Select th O Don't To t Start Volt	is button to use <mark>use Speed Table</mark> turn off, use Spe tage (0-255) <mark>0</mark>	settings s e, use Sta ed Table	shown belov art Voltage (V pane	W Vstart and \	/max)		ot	
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Roster Entry	Basic	: [	Mote	or 📋		Basic Speed Control	[	Speed Table
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	Read changes	on sheet	Wri	ite changes or	she	Read full sheet	Write full she	
		Il choote	Wri	te changes on	all shee	Read all sheets	Write all shee	
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log Controls C	onsist	Advanced	Sound	Sound	l Levels	CV	s Equ	alizer	Rever	b ASC	:				
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Description Forward Heat Reverse Heat Function 1 Function 2 Function 3 Function 4 Function 5 Function 6 Function 7 Function 8 Function 9 Function 10 Function 11 Function 12	dlight FO(f) dlight FO(r)	1 White Yel	Jse this she	eet to de	Ctic etermine Air Horm	>n which Bell I P P P P P P P P P P P P P	functio Output Dynamic Brakes	wire o Short Horn	pin control v r operati Fans RPM +	9 which out Dimming	Mute	ound I Compresso RPM -	Function For Brakes	ONS Coupler	
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SCL 309 F9A CM										_		X
le Reset Windo	ow He	elp										
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Master V	/olume	Control	 [2 [3 [1 [0]	Airhorn Vo	e aust Volu ans Volum	me me		125 80 90 64	Air Compressor Vo	olume alve Volume me		
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le Reset Window Help		Value	Var				1				
Roster Entry Basic	anced Sound Motor	Sound Levels Basic Spe	eed Contr	Equalizer	Speed	ASC Table	L	Function N	Лар	Liat	its
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Read	and on all chests	Write chan			Dood all al	haata	Write	all choc			
Read Cital	ges on an sneets	write cildi	ges on al	3166	Acad an Si	icets		un snee			

### HOW TO IMPORT CV DEFINITIONS AND VALUES FOR ESU DECODERS

- Go to <a href="http://www.loksound.com">http://www.loksound.com</a>
- Download and install the latest LokProgrammer software (for this project, you do not need the hardware from ESU)
- Download the software file for your decoder from the ESU website
- Open the file in the LokProgrammer Program and make changes in THIS program first to make the programming easier.
- Export the CV List to a TEXT file (*yourfilename*.TXT)
- Open JMRI DecoderPro and select your decoder, and create an new definition file for your locomotive.
- Import the CV List from LokProgrammer into your JMRI file!





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News

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- Loco pictures
- Catalogues



#### "Service - For us more than just a promise"

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A comprehensive customer service also means for us to keep you steadily informed about news and updates. Please check our download section for instruction manuals, additional information and catalogues about our products. Furthermore we offer a variety of sounds for free download. Help yourself!

Forum Sales



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Videos

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Q

Search website



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Here you can download the latest LokProgrammer software as well as the recent firmware for our decoders.



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#### Loco Icon Bazaar

Here you are able to download free loco icons for your ECoS or provide your self-created images to other ECoS users.



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anymore.





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Here you can find sound files for LokSound V4.0 Decoders of North American and Australian prototypes. We make some Canadian files as well...

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Here you can find sound files for LokSound Select Decoders

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Here you can find LokSound North American and Australian Sound files we created especially for the usage with selected LokSound factory equipped locomotives.

> Browse projects

→ C ☆ ③ projects.esu.eu/projectoverviews/2 ←



Drivers' cab Read / Write CVs	LokProgrammer 4.6.2	2         Read and Write CVs         CV       1       •       Read         Value       0       •       Write         Bit [7.0]       •       •       •         CV31       16       •       •         CV32       0       •       •       •         What do you want to do?       •       •       •         What do you want to do?       •       •       •         Open an existing decoder project       •       •       •         Open an existing decoder project       •       •       •         Show wizard on startup       Close       •       •	





$\leftarrow \rightarrow \checkmark \uparrow \square$ > Thi	s PC > Local Disk (C:) > Users > SysopNT > Documents > LokProgramme	r4 v ♂ Search Lol	(Programmer4
Organize 🔻 New folde	r		
Desktop 🛷 ^	Name	Date modified	Туре
<ul> <li>Downloads</li> <li>Documents</li> <li>Pictures</li> <li>Downloads</li> <li>Oownloads</li> <li>Cloud Drive</li> <li>iCloud Drive</li> <li>72402-LSV35-AL</li> <li>JMRI_Clinic</li> <li>LokProgrammer</li> <li>LokProgrammer</li> <li>ConeDrive</li> <li>OneDrive</li> </ul>	CV_EXPORT_Bowser_C430_ALCO_DEMO.txt	5/8/2016 8:17 AM 10/2/2017 6:58 PM	Text Document File folder
File name EMD_ Save as type: Text Fi	Dual_567_AMTK_251.txt Tes (*.txt)	Save	e Cancel

#### 🗮 DecoderPro: All Entries

......

File Edit Settings Actions LocoNet Window Help

Help New Loco									
ID	DCC Address	Icon	Decoder Model						
AB&E 407 2-8-0 Camelback	407		TSU-1100 Steam						
ACL 328B as 3281 F2B	3281		QSI Revolution Diesel						
ACL 328 EMD F2A	328		QSI Revolution Diesel						
ACL 386 F3A Phase IV	386		TSU-GN1000 EMD 567						
ACL 529 EMD E7A	529		FX-U F3 EMD567						
ACL 529 EMD E7A	529		FX-U F3 EMD567						
ACL 545 EMD E8A	545		QSI Revolution Diesel						
ACL 857 FP7 TSU-OEM CM	857		FP7						
ACL 867 FP7 TSU-OEM CM	867		FP7						
ACL 975 U30B	975		Atlas U30B w/Mars						

![](_page_47_Figure_0.jpeg)

#### 🚆 AMTK E8 251 LS

File Reset Window Help

Drint >	Function Labels	Roster Media	Basic Motor	Basic Speed Control	Speed Table	
Print Preview >		ID:	AMTK E8 251 LS			
Import >	CSV file	Road Name:				
Export	PR1 file	Road Number:				
	LokProgrammer CV list file	Manufacturer:				
	Quantum CV Manager file	Owner: Model	Carl Marchand			
L		DCC Address:	0 DCC Short			
		Throttle Speed Limit:	100 %			
		Comment:		•		
				~		
			<	>		
		Decoder Family: Decoder Model:	ESU LokSound Select LokSound Select			
		Decoder Comment:		^		
				~		
			<	>		
		Date Modified:	Jan 4, 2018 5:43:53 AM			

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![](_page_49_Picture_0.jpeg)

![](_page_50_Figure_0.jpeg)

![](_page_50_Figure_1.jpeg)

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Function Map

Read Me - IMPORTANT

Sound Slots

Due to the flexible and free-form design of LokSound Decoders, it is possible for project designers to assign sounds to arbitrary sound slots.

Any sound slot labels shown below are only a guide from ESU documentation and may not be correct for the particular sound project loaded into your loco decoder.

![](_page_50_Figure_5.jpeg)

#### 🗮 AMTK E8 251 LS

#### File Reset Window Help

Roster Entry Function Labels Roster Media Basic Motor Basic Speed Control Speed Table Function Map Lights Analog Controls Consist Advanced Sound Sound Levels CVs Function Outputs Function Settings Information Read Me - IMPORTANT Use this sheet to determine which functions will control which outputs

(For hints and instructions for using this pane, see the "Function Map" section of the "Read Me - IMPORTANT" pane,)

1	Ŧ	Conditions (Motion, Direction, F keys, Se	nsors)	Physical Outp (Wires)	outs	Logical Functions		Sounds		
0	Row	Ecoward E0	Changes	Hondlight[1]	Change		Change		Change	Row
0	1	Porward,F0	Change	Readignt[1]	Change		Change		Change	1
0	2	Reverse, FU	Change	Rear light[1]	Change		Change	- Second elect 4	Change	2
0	3	F1	Change	-	Change	- Crada granina	Change	Sound slot 9	Change	3
0	-	F2	Change	-	Change	Grade crossing	Change	Sound slot 5	Change	-
0	2	FJ Mavine E4	Change	-	Change	- Dunamia braka Shift Mada	Change	Sound slot 5	Change	2
0		Moving,r4	Change	- August 1511	Change	Dynamic brake, Shint Mode	Change	Sound slot 6	Change	-
0		F5	Change	Aux 2[1]	Change	-	Change	-	Change	
0	*		Change	AUX 2[1]	Change	- Manual transfer Character Made	Change	-	Change	0
0	9	F7	Change	-	Change	Momentum off, Shunting Mode	Change	- Council alog at	Change	9
0	10	F8	Change	-	Change	•	Change	Sound slot 1	Change	10
0	11	F9	Change		Change	Disable brake sound	Change	Sound slot 2	Change	11
0	12	F10	Change		Change	•	Change	Sound slot 11	Change	12
0	13	F11	Change	-	Change	-	Change	Sound slot 8	Change	13
0	14	F12	Change	-	Change	Coast Mode	Change	Sound slot 21	Change	14
0	15	F13	Change	-	Change	Dim lights	Change	-	Change	15
0	16	F14	Change	-	Change	Heavy Load	Change	•	Change	16
0	17	F15	Change	-	Change	•	Change	Sound slot 15	Change	17
0	18	not F16	Change	-	Change	•	Change	Sound slot 18	Change	18
0	19	not F17	Change	-	Change	-	Change	Sound slot 12	Change	19
0	20	F18	Change	-	Change	-	Change	Sound slot 13	Change	20
0	21	F19	Change	-	Change	-	Change	Sound slot 14	Change	21
0	22	F20	Change	-	Change	-	Change	Sound slot 7	Change	22
0	23	F21	Change	-	Change	-	Change	Sound slot 17	Change	23
0	24	-	Change	-	Change	-	Change	-	Change	24
0	25	•	Change	-	Change	-	Change	-	Change	25
0	26	-	Change	-	Change		Change	-	Change	26
0	27	-	Change	-	Change		Change	-	Change	27
$^{\circ}$	28	-	Change	-	Change	-	Change	-	Change	28
0	29	-	Change	-	Change	-	Change	-	Change	29
0	30	-	Change	-	Change	-	Change	-	Change	30
0	31	-	Change	-	Change	-	Change	-	Change	31
0	32	-	Change	-	Change	-	Change	-	Change	32
$\circ$	33	-	Change	-	Change	-	Change	-	Change	33
			Re	ad changes on sheet	Write changes on sheet	Read full sheet Write ful	Isheet			
			Read o	hanges on all sheets	Write changes on all shee	ets Read all sheets Write	all sheets			
					Programming Mode Dire	ct Byte 🗸				

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### ACKNOWLEDGEMENTS

- JEFF ALEY PROTOTYPE RAILS
- INTERMOUNTAIN RAILWAY
- JOE FUGATE, MODEL RAILROAD HOBBYIST MAGAZINE
- SUNCOAST MODEL RAILROAD CLUB

### ALL OF YOU!

### **BONUS ROUND**

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![](_page_54_Picture_0.jpeg)

## WiThrottle

HOME CAN I USE IT? SETUP THROTTLE IMAGES

#### What is it?

An easy-to-use interface to allow iPhone®, iPad®, and iPod touch® users to link with the popular <u>JMRI</u> software.

#### What is it for?

To control a model train using a wireless connection to a digital command control system.

#### Can I use it?

If you have the necessary equipment, or operate at a location which does, Yes! See our <u>Checklist</u>. Please verify *before* downloading the App.

#### Can I try it first?

A free version, <u>WiThrottle Lite</u>, is also available.

![](_page_54_Figure_11.jpeg)

![](_page_55_Picture_0.jpeg)

### **ENGINE DRIVER**

JMRI THROTTLE APP FOR YOUR ANDROID DEVICE

#### Home

#### Engine Driver - JMRI Throttle for your Android device

![](_page_55_Picture_5.jpeg)

Engine Driver version 2.11. Changes in this release include:

- New Reconnect logic and screen
- show -- ++ instead of << >> when slider is hidden
- avoid crashes reported to Play Store
- handle move of JMRI roster folder

 2.11 changes by Robin Becker and MSteveTodd. [view complete changelog]

This free application can connect to a JMRI WiThrottle server running on a computer, and in turn control your locomotives and your entire model railroad. Speed, direction, and up to 29 DCC functions are supported for one to three locomotives or consists. You can create and edit consists (software-defined). You can also control layout power, turnouts, routes, and access JMRI web panels and windows.

#### Prerequisites:

Verify your Android device can connect to your PC network via WiFi and obtain an IP address. Make sure you are running one of the latest versions of JMRI (2.8 works, 3.8+ works much better) on your computer, connected to your layout. Start up JMRI and verify you can use the included "Throttle" app to control a loco on your layout.

Start the WiThrottle function of JMRI, located in DecoderPro under Tools, Throttles. It is also highly recommended that you start the JMRI Web Server function (Tools, Start JMRI Web Server). Both of these should be added to Preferences, Start Up as well.

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download applications hardware help n	manual	deve	lopers	s ack	knowl	edger	nents	^
IJMRI▲	search	JMRI:	:				go	

#### **JMRI: WiFi Throttle**

This window controls the connection between WiFi throttles, e.g. an iPhone, iPod Touch, or Android Phone, and JMRI.

It can be set to start automatically with the "Start Up" section in the "JMRI Preferences" section of JMRI Preferences under the heading of "Actions".

Preferences for the WiFi throttles can be found in the JMRI Preferences under the heading WiThrottle.

This utility broadcasts its connection information across the local network, so it can be picked up by any device looking for the service. This eliminates having to enter connection information into the device. If the computer running JMRI is protected by a software firewall, you may need to disable the firewall to allow the WiFi throttle to connect.

When using a WiFi throttle, if the computer enters sleep mode, control will be lost. System preferences may need to be adjusted to prevent the computer from putting itself to sleep when it is inactive.

To use your iPhone, iPad or iPod Touch with JMRI as a throttle, you run the <u>WiThrottle</u> app on the iPhone or iPod Touch. The basic application is available for free download from the iTunes store.

To use your Android device with JMRI as a throttle, you run the <u>Engine Driver</u> program or <u>Digitrains</u> on the Android device. These free apps are available from the <u>Google Play Store</u> or the <u>EngineDriver site</u>

The protocol is described on a separate page. For more on JMRI networking, see the networking technical page.

You can also use a web browser in your device to run trains if for some reason you can't install an app on the device.

#### Function Labels

Function labels can be customized for each roster entry through JMRI. These labels will then be displayed in place of the generic F1, F2... on the screen of the mobile device. The labels can be added when a new roster entry is created, or by editing an existing roster entry under the Function Labels tab. To enter function labels, the programmer format has to be either "Advanced" or "Custom".

#### **Routes & Turnouts**

The app can control any turnouts (and routes) that JMRI has control of. If they are available in the JMRI turnout (or route) table, they are automatically available in WiFi throttles. If there are no turnouts (or routes) on the table(s), then the control screen for them does not show in the app. It will do all of this by default. However, if JMRI cannot control them, WiFi throttles will not be able to either.

Additionally, you can limit what turnouts appear. In JMRI, with the WiThrottle window active, there is a menu named WiThrottle. It has an item titled "Filter Controls" that will let you pick which turnouts to display or hide.

#### Advanced Consisting

There are now two options for how Advanced (or Decoder Assisted) Consisting is handled. This can be selected from the WiThrottle portion of JMRI Preferences.

The default is NMRA Format. This will build a consist using NMRA consisting commands. It does not use any techniques specific to the connected DCC system. This allows WiFi throttles to work in a DCC manufacturer independent way. These consists may perform better for building and controlling with WiFi devices.

The second option is **DCC Brand-Specific** which will build consists in a manner where they will function as though built using a throttle from the DCC manufacturer. This will follow manufacturer specific features as to how consists are built and controlled. These consists should perform better when built with a WiFi device, but controlled by a throttle from the DCC manufacturer of your system.

This is the package/jmri/jmrit/withrottle/UserInterface help page

![](_page_56_Figure_21.jpeg)

![](_page_56_Picture_22.jpeg)

	1								
🚆 DecoderPro: All Er	ntries							- 0	×
<u>F</u> ile <u>E</u> dit <u>S</u> ettings	Actions	LocoNet Window	Help						
	Program								
New Loco	Labels an	d Media		Unknown Prog	ramming Mode D	rect Byte			
ID	New Thro	ttle	Decoder Model	Road Name	Road Number	Manufacturer	Model	Owner	
AMTK 901 AEM7 FL4	Load defa	ult throttle layout	FL4	Amtrak	901	Train Control S	FL4	Carl Marchand	Oct 27.
Athearn Genesis USR	Consistin	n Tool	1617 - HO Scale - Light Steam - Universal					Carl Marchand	Dec 14
ATSF 9822 RSD-15 E	Turnent C	g 1001	DH126PS	Santa Fe	9822	Digitrax DH126	Alco R	Hugo Sacco	Oct 10,
ATSF 9822 RSD-15 B	Turnout C	ontrol	Diesel	Santa Fe	9822	BLI BlueLine	Alco R	Hugo Sacco	Oct 10,
SCL 1020 EMD GP9 0	Power Co	ntrol	QSI Revolution Diesel	Seaboard Co	. 1020	Athearn	EMD G	Carl Marchand	Sep 26
SCL 1036 GP9 Titan (	SpeedoMe	eter	FX-U F3 EMD567	Seaboard Co	. 1036	Athearn Genesis	EMD G	Carl Marchand	Sep 26
SCL 1252 RS3 Atlas (	Single CV	Programmer	Four Function Dual Mode	Seaboard Co	. 1252	Atlas Classic	ALCO	Carl Marchand	Nov 1,
SCL 1407 GP35 CM	Single ev		LL110LC Diesel	Seaboard Co	. 1407	Athearn RTR	EMD G	Carl Marchand	Oct 7, 2
SCL 1413 GP35 DH1	Multi-Dec	oder Control	DH165A0	Seaboard Co	. 1413	Athearn RTR	EMD G	Carl Marchand	Nov 16
SCL 1413 GP35 SFX0	Start WiTI	hrottle Server	SFX004	Seaboard Co	. 1413	Athearn RTR	EMD G	Carl Marchand	Nov 16
SCL 1413 GP35 Tsun	Start Web	Server	ISU-GN1000 EMD 567	Seaboard Co	. 1413	Athearn RTR	EMD G	Carl Marchand	Nov 18
SCL 1415 GP35 DP57	Start Web	/ Jeivei	DP5X	Seaboard Co	. 1415		END 0	Carl Marchand	Nov 19
SCL 1651 GP40-2 CM	Recreate	Roster Index	GP40-2	Seaboard Co	. 1651	Athearn Genesis	EMD G	Carl Marchand	Sep 26
SCL 309 F9A CM	Recreate	Decoder Index	F9	Seaboard Co	. 309	Athearn Genesis	EMD F9A	Carl Marchand	Jan 5, .
SCL 399 F7B CM	Undate De	coder Definitions		Seaboard Co	405	Atheore Conocio		Carl Marchand	NOV 29
SOL 403 EMD FTA CM	opuate De	couer Demnuons	AT100LC/KT100LC Discol	Seaboard Air	400	Atheore Conocio		Carl Marchand	Dec 5,
SOLI 3023 LI23B Mike	Run Scrip	t	D13SR1	Southern PR	2022	Attac	CE LI3	Mike Sewell	Oct 10
SOLI 3923 LI23B Mike	9	1654	LokSound Select Alco 244	Seaboard Air	1654	Atheorn RTR	Alco R	Carl Marchand	Oct 10
SOU 3982 B23-7 Mike	s	3982	D13SR.I	Southern RR	3982	Atlas	GE B23	Mike Sewell	Oct 10
000 0002 020 1 11110		0002	510010	oodanomrat	0002	/ lido	02 020		1000 10,
									•
			ID: SCI 1415 CP35 DP5X			۲	Program	ming Track	
		Road	Name: Seaboard Coast Line			Š	rrogram	ing frack	
		Road N	umber: 1415			$\bigcirc$	Program	ming On Main	
		Manufa	cturer:			0	EditOnly		
			Owner: Carl Marchand			Ŭ			
			Model:						
		DCC A	idress: 1415					Program	
		Decoder	Family: Jan 2000						

Labels & Media

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Throttle

 Filename:
 SCL\_1415\_GP35\_DP5X.xml

 Service Mode Programmer LocoNet Is Online
 Operations Mode Programmer LocoNet Is Online
 Programmer Status: idle
 Active Profile: My JMRI Railroad

Decoder Model: DP5X

![](_page_58_Picture_0.jpeg)

### MANUAL SERVER SETTINGS

●●●●○ Verizon ᅙ	10:07 PM	<b>1</b> ♡ ∦ 🛄						
/	Address:							
Dispatch	Both	Release						
Cur	rent Serv	/er:						
ι	Unknown							
on: None	Selected							
SSID: 240	HZWIFI							
Use auton	natic netv	work						
configurat	i <b>on</b> ed ON)							
De	vice Nam	ne:						
0								
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![](_page_59_Picture_2.jpeg)

![](_page_59_Picture_3.jpeg)

![](_page_60_Picture_0.jpeg)

•••• Verizon 穼 9:54 PM

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24GHZWIFI\_EXT Manual Setup

192	168 . 1	. 12
Port:	54473	Set
-		-
1	<b>2</b> авс	3 Def
<b>4</b> <sub>GHI</sub>	5 JKL	6 <sup>мно</sup>
<b>7</b> PQRS	<b>8</b> TUV	9 wxyz
	0	$\langle \times \rangle$

![](_page_61_Picture_0.jpeg)

### JMRI RESOURCES

- JMRI WEBSITE:
- YAHOO GROUP:
- DIGITRAX:
- RR-CIRKITS:
- NCE:

http://jmri.sourceforge.net

https://groups.yahoo.com/neo/groups/jmriusers

http://www.digitrax.com

http://www.rr-cirkits.com

http://www.ncedcc.com

![](_page_62_Picture_0.jpeg)

![](_page_63_Picture_0.jpeg)

VISIT OUR WEBSITE:

http://www.suncoastmrrc.com