RV-C OmniScope 2

Technician Manual

Version
8/09/23

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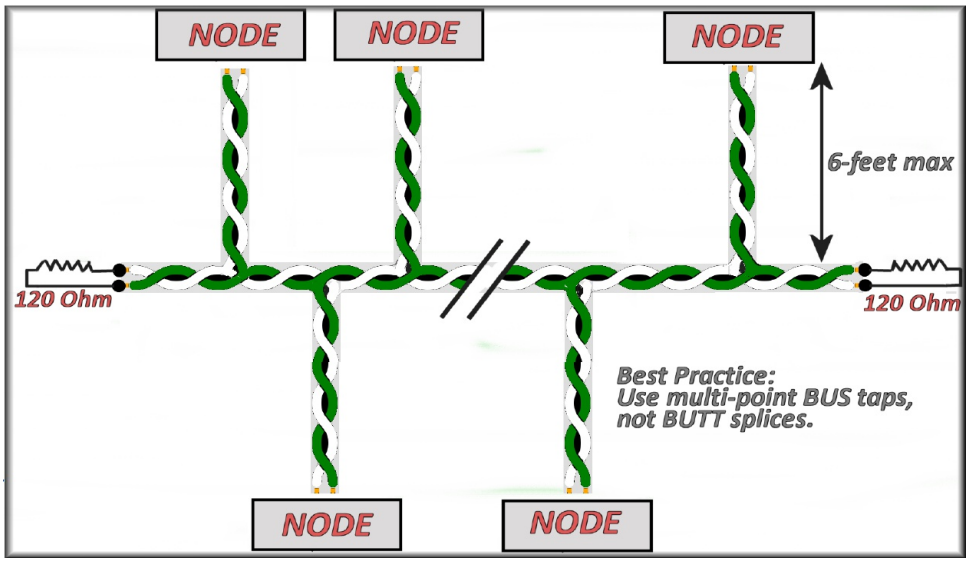
Introduction

OmniScope is a diagnostic tool for RV-C network components. It enables module configuration and troubleshooting.

Introduction to RV-C

The network or "CAN Bus" for RVs is called RV-C. It's a standard for RV appliances to share information, provide diagnostic data, control and be controlled. It is a "peer" network, meaning every appliance (black box/ display), or "node", is equal in the eyes of the network. A typical network will consist of at least one or two control panels, one multipurpose controller, and any number of appliances such as inverters, generators, and slide rooms. All the data is shared digitally using a single pair of wires. These two wires form a "bus", connecting each node. The "trunk" of the bus may be quite long, but the "drops" (lines from trunk to node) are limited to no more than six feet in length. At each end of the trunk is a 120 ohm resistor connecting the two data lines. These resistors absorb any "ringing"on the bus. Each factory RV-C equipped coach should include a nine-pin circular connector, located either under the dash or in the utility bay. This connector allows the service tool to tap into the network and become another node in the system. In the event one wasn't added, a 'T' or bus-tap must be used to 'tap in.' Helpful Hint: When you do an RV-C conversion, include one or two of these sockets to make installation and maintenance easier. You will likely see this coach again; make it easier now. Once connected, the service tool can send commands and ask for data from every node in the system. Nodes send commands and messages in small packets. Each packet can contain several pieces of data - for example, temperature, current, and voltage. Each packet is identified by a Data Group Number, or DGN, and you can determine the contents of the packet by looking up the DGN in the RV-C documentation. Some DGNs are unique to a certain type of product - e.g. Slide Rooms use a DGN called SLIDE_STATUS. Some DGNs are common to all products - e.g. the PRODUCT_ID DGN is universal to all RV-C devices. For the most part you don't need to know the details of the DGNs to troubleshoot a network. It's the software's job to parse these packets of data into meaningful values on your screen. One of the most important DGNs, which is common to all RV-C nodes, is the DM-RV, or Diagnostic Message. This message is sent by all nodes to communicate general operating status and whether any problems have been detected. Each node has a Source Address, which is used simply to make sure no two nodes talk at the exact same time. But a node may have more than one function - e.g. an inverter/charger is both an Inverter and a Charger. These multifunction nodes may display multiple DM1 messages. For example, the Charger may be Off, while the Inverter is On and displaying a Low DC Voltage warning. Each DM1 is distinguished by a DSA, or Default Source Address, which shows which function is being described in the message.



Starting OmniScope

This is an advanced tool capable of helping the technician troubleshoot, service and configure RV-C based equipment. Make sure you understand the potential outcome before making changes with OmniScope.
Plug in the USB-to-RV-C adapter into the PCs' USB port. When starting the program you may see “Tool Not Responding” message. This can be caused merely by unplugging the adapter unexpectedly, and is not necessarily a real problem as the program often can find the adapter on a second try. If it can't, the program will abort. Make sure the adapter is plugged in and try again.

Checking The Adapter

OB Module:
The adapter has LEDs on the edges. Look for a solid green and a red blinking. From the OmniScope main page, Press the 'Options' button, then 'Connections Options' button, then 'USB Adapter type'. Select OB series. From the OmniScope main page, press 'Connect'. Select USB. The device list should populate. The adapter has four LEDs. During Operation, the Red LEDs should be blinking. If not, check the connections. Try pressing 'Connect' then 'Disconnect' then 'USB'. The device list should appear. If not, press 'Options', 'Connection Options', 'USB adapter Type' then pick the "FT" or "OB" for you adapter type. Try again.

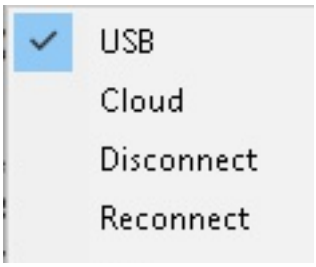
FT Module:
From the OmniScope main page, Press the 'Options' button, then 'Connections Options' button, then 'USB Adapter type'. Select 'FT series'. From the OmniScope main page, press 'Connect'. Select USB. The device list should populate.
The adapter has four LEDs, two green, two red. When you first plug it in you should see just one green LED flashing. If not, then the unit is not receiving 12Vdc power - check the cable and the port for problems.
Once the OmniScope program has initialized the adapter, rapid flashing will stop. Instead the LEDs will start flashing with each data packet that it sends and receives on the data bus. If you have not yet plugged the adapter into the RV diagnostic port there should be an initial few flashes and not much else. When you plug it into the RV you should start seeing lots of activity.
You can verify this by clicking Modules - Network Monitor in the OmniScope program. This will Open the Network diaglog. A chart of colored blocks appear. Click on one to reveal the module type. Information about the module will be at the bottom. Network traffic will show at the right.

First time setup:

Select 'Options' then 'USB Adapter Type, then the type of adapter box FT or OB.

Select 'Options' then 'Keys', then 'Change Key Folder'. Select the 'omniscope' folder.

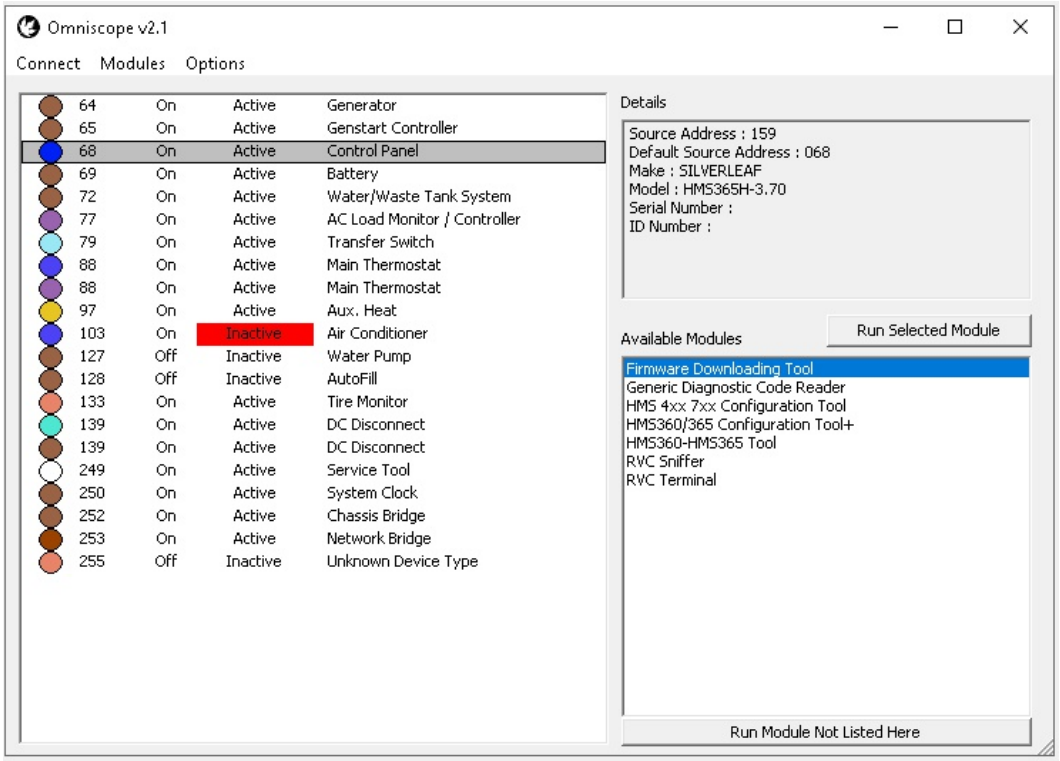
Select 'Connect' then USB.



Running the OmniScope Program

OmniScope provides a general overview of the status of the nodes on the RV-C network, and it provides a way to run other programs called "modules". It's the modules that do most of the real work - OmniScope itself is simply a starting point.

The OmniScope screen shows three boxes. On the left is the "Device List" - a list of every "Device" that has been detected. Keep in mind that one device may include several functions - each function will show up as a different device line item. The color of the dot will remain the same for the lines where its device appears.

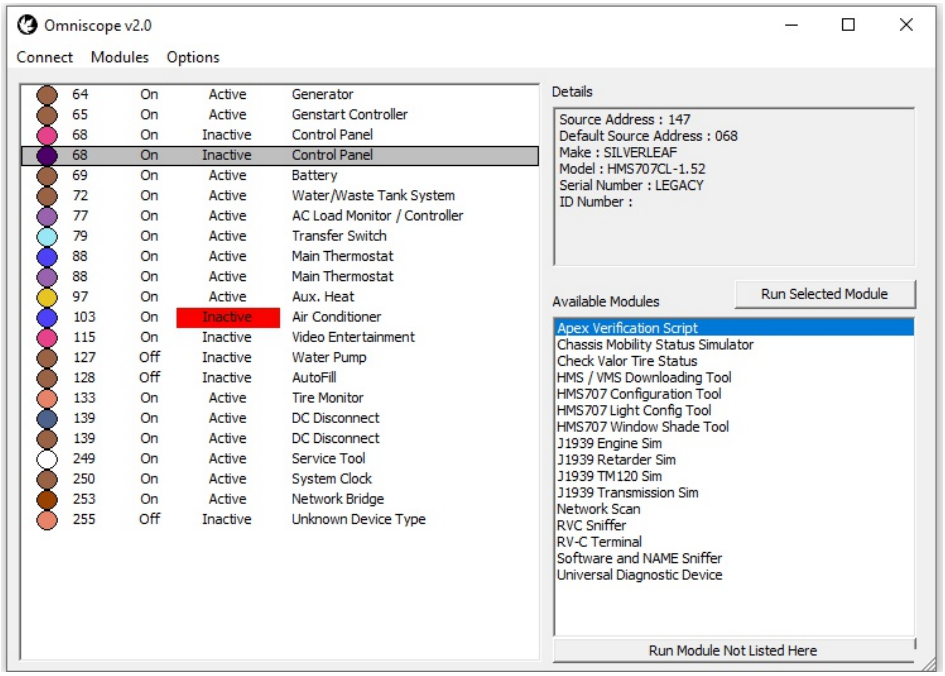


For each device OmniScope lists a color dot, the DSA, or Default Source Address. This code merely identifies the function of the device- e.g. generator or inverter. Next it lists the general operating status, "On" or "Off", and "Active" or "Inactive". For example, the charger may be "On" but "Inactive" if no AC power is available for charging. The status may be highlighted in red or yellow if some sort of problem is being reported by the device. This can be helpful by identifing the module reporting the problem, and narrowing the search for a problem. The Device List (left side) will always include at least one item: the Service Tool itself.

To the right of the Device List is a Details box. If you click on any device from the device list, the Details box will provide additional information about that device. It will show the actual Source Address of the device, and more importantly it will show whatever Product Identification information the device will provide. This may include manufacturer, model, and serial number.

In the lower right is the "Available Module List". This box shows all the modules available for a selected device. For example, clicking on a 'Control Panel' for a SilverLeaf HMS707 touch control, may present a selection of modules such as the Universal Diagnostic Device, RV-C Terminal and the HMS707 Configuration Tool. Clicking on an Genstart Controller (TM102) would bring up a different list of modules, though would still include an RV-C Terminal. Many tools are universal and appear when any device is selected.

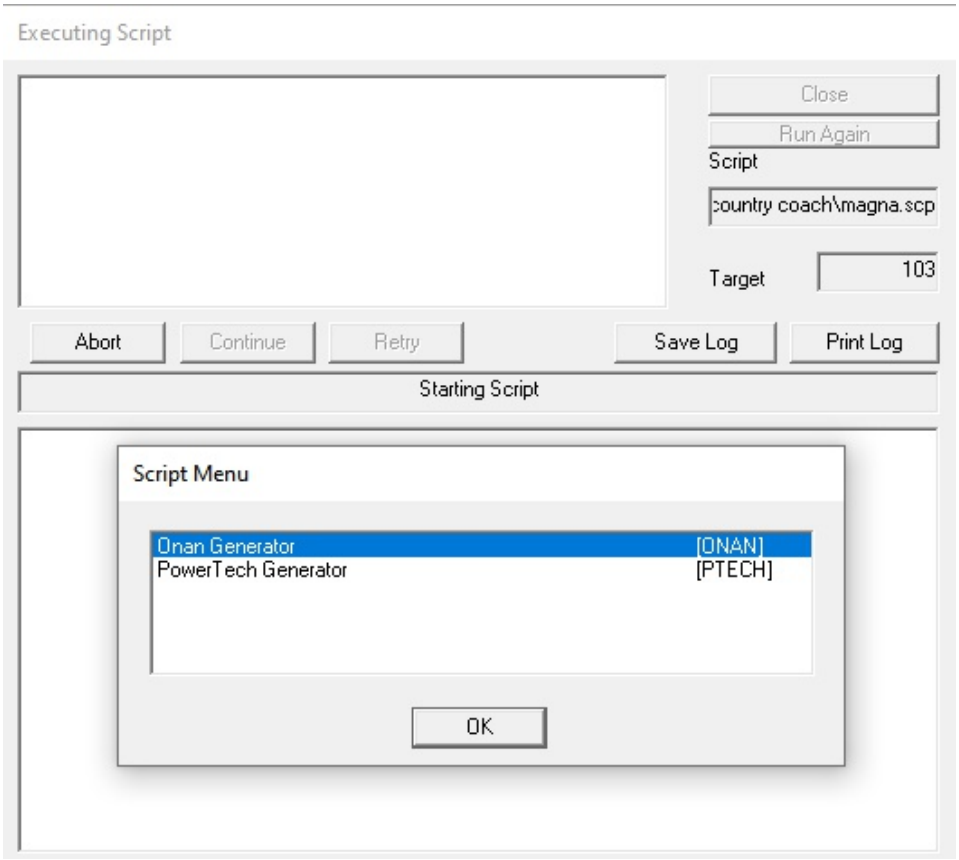
Running Modules



When you select a device from the Device List, the "Available Module" List will show all the modules that are installed on the computer that are relevant to that device. Double-click on any module, or select a module and click on the 'Run Selected Module' button.
Modules can be either scripts or full-fledged programs. A program can have almost any conceivable purpose, and each such program should have its own instructions. The only limitation placed on a program module is that the program module must be shut down before you shut down OmniScope. You can run more than one program module at a time, and simply Alt-Tab or click the task bar to switch between different program modules.

If the module you need is not listed in the "Available Module" List, make sure the desired target device is selected in the Device List. Then click on the 'Run Module Not Listed Here'. This will bring up a standard Windows File Selection dialog, and you can select the desired program (".exe") or script (".scp" or ".ocf"). If you do not select a device before starting the program or script, the module may not run properly.

Running Scripts



Scripts may be run by pressing 'Run Module Not Listed Here' at the bottom of the Available Modules box. Only one script can be run at a time, and running a script does not open a new, separate program. A script is a set of instructions to be processed by OmniScope. Typically the instructions are RV-C commands, to configure or test devices on the network. Simple scripts often run automatically, with little or no intervention from the user. The script will start by opening the Script Execution window. The top left box in this window provides information on the status of the script execution. The script writer may include various messages to provide feedback for the user.

The script may include pauses, where the script will wait for you to accomplish something and/or click a button, enter a term or name or just hit 'Enter' after a message is displayed. The 'Abort' button will end the script. The 'Continue' button will cause the script to resume processing. While the script is running you can click 'Abort' to stop the script mid-stream.

Some scripts may include commands that require a specific response from the target device. In this case you may see the 'Retry' button activate, meaning that the device has not responded as expected and you have the option of trying the command again. Clicking on 'Continue' will cause the command to be skipped. When the script is complete, click on 'Close' to close the window and return to the main OmniScope screen. Clicking on 'Print' will print the contents of the status window to the default printer.

Some scripts require more intervention from the technician. Scripts can include menus. For example, a configuration script for a certain model of RV may require you to choose various options such as the model of generator or the floor plan of the RV.

Scripts can also feature displays of live network data. The box at the bottom of the Script Execution box is the 'Monitor List'. Scripts may put data items in that box, and the data items will continuously update with the latest values that appear on the network. Two numbers will appear next to the name of the data item. The number in the middle is the current value. This can be “N/D”, or “No Data”, meaning that the data item has not been detected on the network. It can also be “Err”, meaning that the device sending the datum is registering some problem with the data item.

The number on the right is the number of times the datum has been seen on the network. Normally this should continuously count up. The speed depends on the type of data, and can vary from ten times per second to once every five seconds. In some cases the data is only provided on an “as needed” basis.
The Monitor List can also include lines with no numbers. These lines are actually “buttons” than can be double-clicked to trigger specific commands. The effect depends on the intentions of the script-writer. This technique is often used to provide a way to test various system functions, such as starting the generator or leveling the RV.

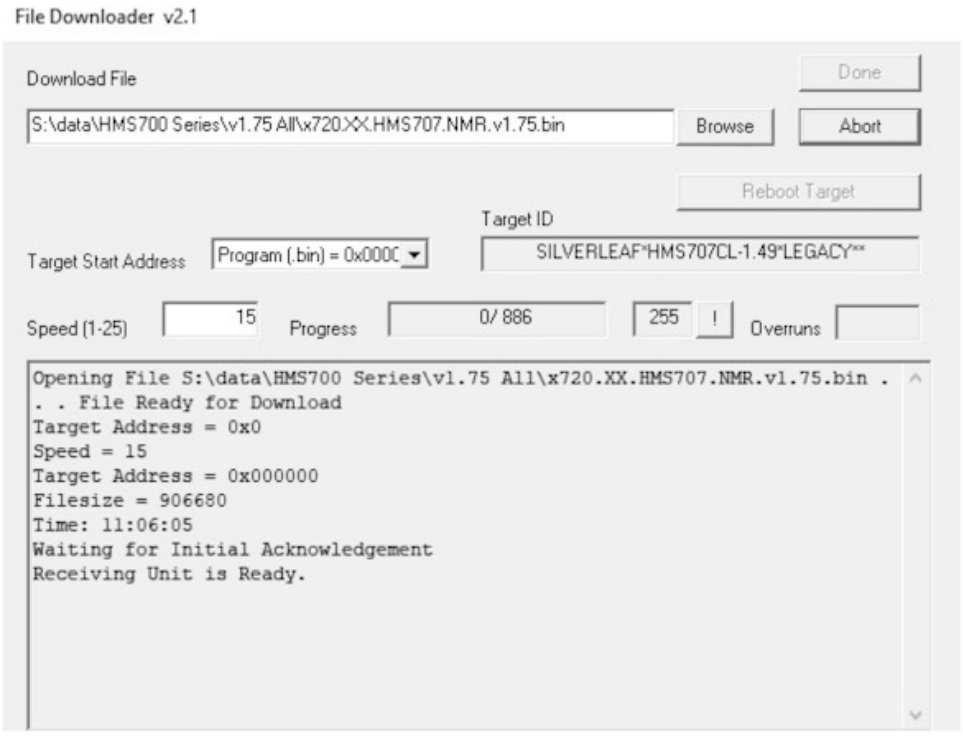
RV-C Sniffer

(Omniscope Standard version only)

This presents real-time traffic as "sniffed" off the RV-C bus. It will also give the number of each message, allowing the viewer to see a struggling or faulty device. It also reveals any errors currently broadcasted and includes the ability to take a (text file) snapshot.
The Sniffer displays the selected module parameters and current values. The parameters can be alphabetically sorted and cleared to refresh the list.
The module model and revision are shown near the bottom of the screen.

Firmware Downloading Tool

The Firmware Downloading Tool enables you to load firmware to the module selected. The "Target ID" shows which module is to be programmed.
Browse to the file to be loaded. Adjust the "Speed (1-25)" to 15 and temporarily disconnect the TM102 main connector. Press 'Start' to begin the process. The "Progress" field will start changing to show programming progress.
Do not disconnect the module being programmed before it is finished. This can result in bricking the module. The programming progress can be aborted while in progress by pressing the 'Abort' button. Completion will be reported, then the module can be rebooted to finish. Press 'Done' to return to the previous menu. Re-connect the TM102.



Generic Diagnostic Code Reader

The Generic Diagnostic Code Reader displays diagnostic messages from modules. If the 'Device List', 'Active/Inactive' area of a module is red or yellow, select that module. Select "Generic Diagnostic Code Reader" from the 'Available Modules' box. The diagnostic message is shown on this menu. A brief diagnostic message or messages will be shown. This can direct troubleshooting efforts to determine where a problem exists.

RVC Datalogger

RVC Datalogger can be found under the Service Tool from the device list.
Select RVC Datalogger. You will see a stream of data scrolling. To record, Press the folder icon with the arrow in the upper right corner of the dialog box. Navigate to a folder of your choice and give it a meaningful name. Place a checkmark in the 'Record to Log File' box. Un-check the box when finished, or press 'OK'.

Logs can be played back using the 'Datalog Playback Tool'.

Configuration Tools

Modules have configuration tools in the 'Available Modules' box. The names may very per module. These tools allow for configuration settings changes to modules. Select one and double click it to open the menu. Configuration changes can be made within the menus.

RV-C Terminal

This module is used to send messages and receive information such as a log or “records” file. Typing help on the command line will bring up a list of terms you can then use. To use the commands, select 'System Clock' from the device list. Double click on 'RVC Terminal'. Place a check mark in the box for 'Use Old-Style Addressing'. Type one of the commands shown below. Here's the most used and useful, along with some pointers:

TM102 list:

all	= display CAN status
adc	= display analog counts
actinv	= display active inverter
batt	= display battery status (Its just a snapshot)
can	= display CAN status
cbridge	= display chargebridge status
charger	= display charger status
clock	= display real-time clock
dev	= display device list
erase	= clear diagnostic messages **WARNING** This deletes the TM102 log file! <--
exec	= display executive status
ffmem	= initialize NVRAM
flash	= display flash status
gen	= display genstart status
io	= display I/O status
j1939	= display J1939 parsing info
log	= display diagnostic records. log -50 = 50 records. Don't type the word by itself !
mem	= display memory size
nrec	= display number of diagnostic records Usually thousands long, Use this with log
nvram	= display NVRAM content
onan	= display onan status
outback	= display outback status
parse	= parse RV-C message
peek	= display memory contents
port	= display I/O port status
reset	= reset NVRAM to factory defaults
send	= send RV-C message
ser	= display serial status
surge	= display surgeguard status
tank	= display tank status
therm	= display thermometer status (If none are connected, expect an empty space)
ver	= display TM102 version
? or help	= display this help

TM1000 List:
To use the commands, select 'System Clock' from the device list. Double click on 'RVC Terminal'. Type one of the commands.

?	=Show this Help.
acmon	= AC Status
ags	= Show AGS Status
alrmgr	=Show Alarm Manager Details
batt	=Battery Status
black	=Tank Status
clock	= Show Clock Status
cls	= Clear Screen (1 param)
dcdisc	=Show DC Disconnect Status
dev	= Report Device Status <rid (optional)>
en	= Get Enabled Status
erase	= Erase all log
ev	=Get Timer Lists
exec	=Show Executive Status
exer	= Show Exerciser Status
exit	= Exit Production Test
fakerec	= Generate Fake Diagnostic Records
fill	= AutoFill Status
floor	= Floor Heat Status
fresh	=Tank Status
gen	=Show generator status
gensw	=Show External Generator Switch Status
invchg	=Show Inverter/Charger status
io	= Show IO Statuses
j1939chs	=Show J1939 Chassis Status
j1939mgr	=Show J1939 Manager Status
keygen	=Show Key Hold Generator Status
log	= Display diagnostic log. (d#start d#recs)
nrec	=Display number of diag records
nvram	=Show NVRam Metrics ('nvram ?' for details)
obd	=Display pid val (requires 1 numeric arg)
pump	=Water Pump Status
reboot	= Reboot Device
rid	= Filter diagnostic log (x#rid) rid FF shows all.
rvcmgr	=RV-C Manager Status
stop	= Stop log download
test	=Start Production Test
wdg	=Watchdog Test

OmniScope vX.X ------ Main Screen Menu ----------

Connect

USB
Computer connection to the USB JIB.
Cloud
TBE
Disconnect
Disconnects OmniScope from its data source.
Reconnect
Reconnects OmniScope to its data source.
Exit
Leaves OmniScope.

Modules

Run Unlisted Module
Opens a navigation dialog to look for a path to a module to be run.

Run Selected Module
Select a device from the list on the left. Select a module from the list at the lower right. The module will run. (The same as double clicking the module listed in the lower right.)

Run External Module Folder
Opens a navigation dialog to locate a module to run.

Quick Script
This is a scratch pad to enter commands, then run them.

Network Monitor
The Network Status window has a grid with colored squares representing modules. Clicking on one will show its identity and functions. The Network and Node traffic is shown at the bottom. There is a Run Module button to allow programs to be run. It opens a navigation dialog to select the module. Along the bottom there is a sliding traffic monitor. Traffic is shown as color bars matching the module colors from the grid. This monitor provides a sense of the traffic density and which modules are communicating.

Send Reboot Command
Select a device from the Device List on the left. Press 'Send Reboot Command'. Reboots that device.

Device Lists >
Export:
Opens a navigation dialog to save a module device list.
Compare:
Allows for device list comparison.

Options

Updates >

Auto Update on Startup will enable auto updating or turn that feature off. A check mark Indicates auto update is enabled.

Update Now will open OmniScope Updater.

Keys >

Add New Module Key, opens a dialog to enter hardware key. Enter the key on the back of the module with special characters and is case sensitive.

Change Key Folder, opens a file exployer to allow a change of location of the key file.

Connection Options >

Connect on Startup (Put a check mark for this one)

USB Adapter Type >

FT Series

OB Series (Place a check mark for the type of Omniscope box)

Data Rate >

Choice of 250 RV-C or 500 J1939

Connect on Startup

Advanced Options >

Scan Network (Check box)

Change Module Folder (Dialog navigation for module folder)

Reset Folders to Defaults (Careful)

Change QuickScript File (Navigation path for QuickScript files)

Mute Mode > (Messages settings)

Echo Tool Transmissions (Check box)

Debug Port enabled (Check box)

Legacy DM1 Support (Check box)

Show Phantom Devices (Check box)

About

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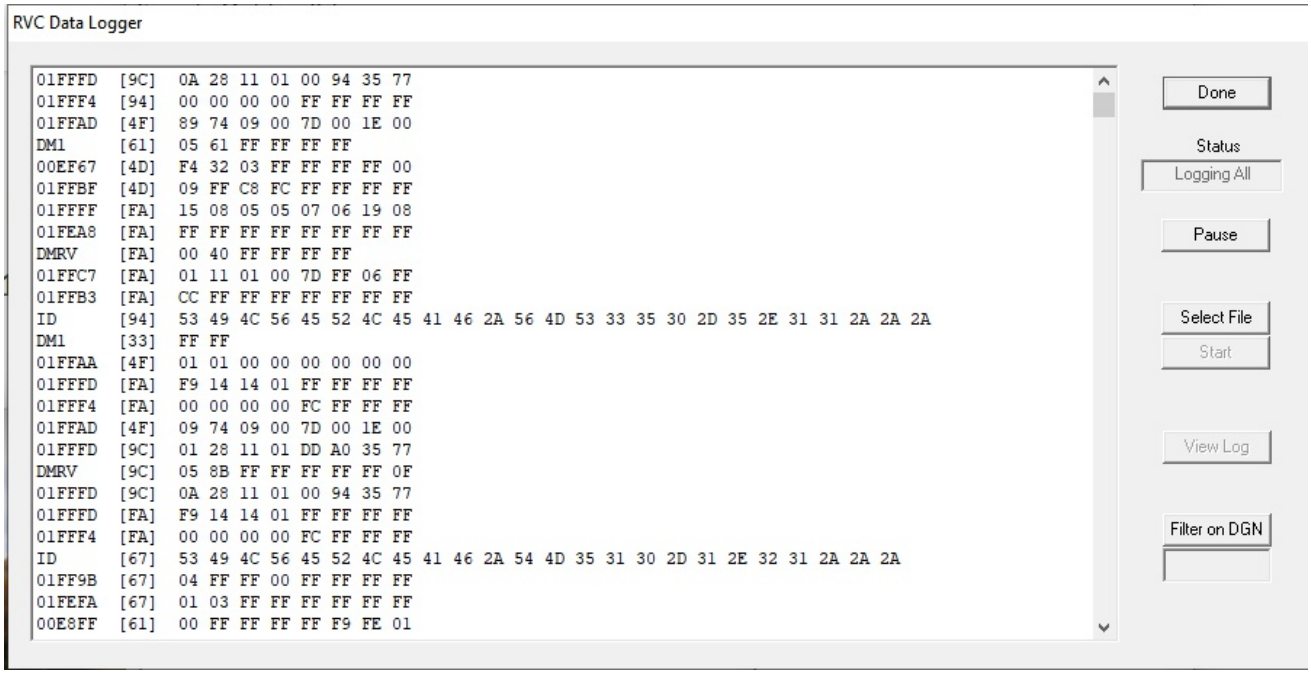
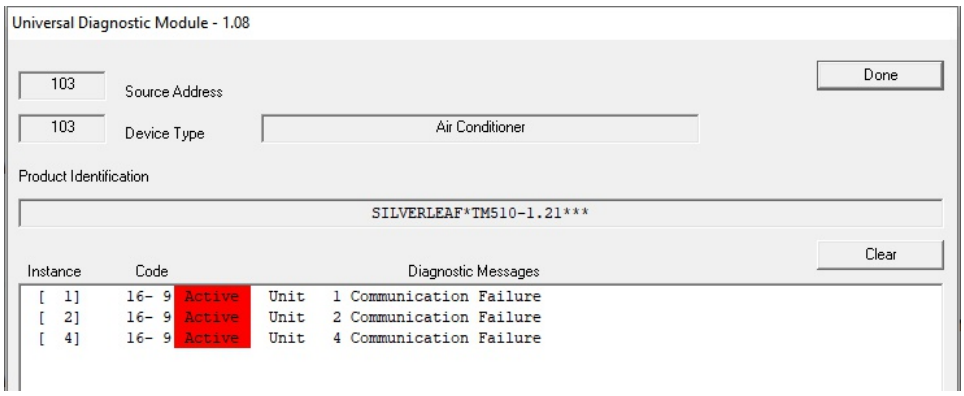
Copyright

Data Logging Tool

The Data Logging Tool can be found by selected the "Service Tool". Double click on the 'RVC Datalogger'. The menu varies. Live RV-C data will scroll past. The buttons on the right allow you to record and make selections.



Generic Diagnostic Code Reader



The Generic Diagnostic Code Reader can be used to troubleshoot any RV-C device, regardless of the make or manufacturer. All devices that are fully RV-C compliant provide basic troubleshooting information that this module can display and interpret. It is important to select the proper target device before starting this program. The module will provide information only for the selected device. The module displays the Source Address for the target device, along with the Device Type (or DSA). The Device Type indicates generally what type of product the module is looking at. Note that sometimes a product may include several different devices. For example, a generator may include a “Generator” (DSA 64) and a “Genstart Controller” (DSA 65). One of these devices may be malfunctioning while the other is functioning fine. Or, one may have a problem linked to the other. The module also displays the full Product Identification. This is a long string of letters and numbers separated by asterisks, and indicates the manufacturer, product model, and may include serial numbers as well. The details are up to each manufacturer.

The main window shows the diagnostic information, as provided by the device in the DM1 diagnostic message. The first three values, shown in brackets, shows the general status of the device. First, whether the device is On or Off. Second, whether it is Active or Inactive. Third, whether the device is in a “Yellow” or a “Red” fault condition.

The distinction between On/Off and Active/Inactive varies among devices, but most devices are either Off, On and Inactive, or On and Active. On and Active means it is fulfilling its designed purpose at this moment. On and Inactive means it is not producing anything at the moment, but it is prepared to do so at any appropriate moment - it is “standing by”. And Off means it will not do anything without some intervention (usually, but not always, from the user). Note that an item that is Off likely still has power - otherwise it couldn't tell the network that it was off.

Generally “Yellow” faults are situations which can be remedied with only basic intervention, or have negligible effect on the operation of the device. A typical “Yellow” fault is low battery levels for an inverter. “Red” conditions are more serious, and generally require attention from a technician. These guidelines are subjective, of course, and manufacturers may interpret them differently.

The next item displayed is a number called the SPN, or “Suspect Parameter”. This number has two different forms, and the module shows both forms. In the raw form the SPN is just a number. In the parsed form it is a series of three numbers - in the example those numbers are 1, 1, and 0.

The interpretation of these numbers depends on the product. Most manufacturers provide a table of the SPNs for their device, and that table will indicate the proper form for that device. The distinction relies on whether the device is designed to allow multiple “instances” on the network. The parsed form allows the table to show which specific device the fault applies to. The raw form is used for products that can't have more than one installation on the RV.

Regardless of the form, the purpose of the SPN is the same. It identifies what component of the device is malfunctioning. For example, in a generator the SPN might refer to the oil pressure or tachometer. In a slide room the same SPN might refer to a proximity switch. Every different device has its own list of potential SPNs.
The last number (1, in our example), is the Failure Mode, or FMI. This number is universal among all devices, and identifies the general nature of how the SPN is bad. For example, an FMI of 1 means “Below Normal Operating Range”, which would be a serious fault if the SPN is Oil Pressure.
Fortunately, the module automatically looks all this data up in its own tables, and provides the interpretation on the next line. This interpretation is general to all manufacturers, so it will not necessarily use the exact same terms as the manufacturer's documentation.
Normally the diagnostic information is sent automatically. If the device is not responding properly, clicking on the Poll button will request updated information from the device.

Configuration Tools

Warning:

Most configuration tools allow the tech "back door" access to functions and settings deemed too specialized or dangerous for the casual user-owner to manage. These range from battery chargebridge and GenStart to Tank monitoring, heater and burner controls to network addressing. Each of these may operate in real-time and a mistake or 'bad' setting has the potential to create havoc at best, confusion for other techs and damage to the equipment and people at worst. Do not change a setting unless you are sure of an appropriate, measurable outcome.
That said, the various configuration tools are set up uniquely, depending on the equipment they modify or manage. Many contain an option to 'Save for Cloning'. Think of this as a way to "fallback" to prior settings or migrate the setup on a given Silverleaf box to its replacement or another coach. This is common when like-coaches are available for troubleshooting; a given unit in a known-good coach may be cloned and that newly created (txt) file can be used to overwrite a unit with known or suspected bad settings. Use this tool often, save the setting this way before troubleshooting. Plan-ahead for success.

Installation

Installing the program:

What you will need:
Microsoft Windows, an Internet connection, a full size USB connection, the ability to install programs and enable file extentions in file explorer, and the Omniscope kit hardware.

Download the OmniScopeSetup(xxxxx).exe installer and run it. OmniScopeSetup will create the required directories automatically. An existing version of OmniScope will be moved to another directory. Key files will be copied from previous installations to the new OmniScope folder. For new installations, a key.txt file will need to be created.

Hardware Key Installation:

On the FTxxxxx OmniScope adapter box, the hardward key is on the back. Type this key, as shown with dashes, into 'Options', 'Keys', 'Add New Module Key', "New Key Code" field. Press 'Add'.

For the OBxxxxxx OmniScope adapter box, a key.txt file will be included with the installation directions email. Place the file in the C:\omniscope directory. Start Omniscope. Press the 'Options' button, then Press 'Connections Options' then 'USB Adapter Type', then 'OB Series'.

If your shop is using multiple adapters, you can enter hardware keys for all the different adapters on all the different computers. Paste the key in the “key.txt” file. It is located in the OmniScope directory. Thus you can install OmniScope and its modules on any number of computers, as long as you have at least one valid adapter and the proper code.
Lost your "sticker" and don't know the code? Call us; we'll re-create it for you while on the phone.

Connect the Omniscope adapter to the computer. Connect the Omniscope adapter to a coach. A device list will appear.

Goto the Running Omniscope Program section above for further information.

Subscription Key

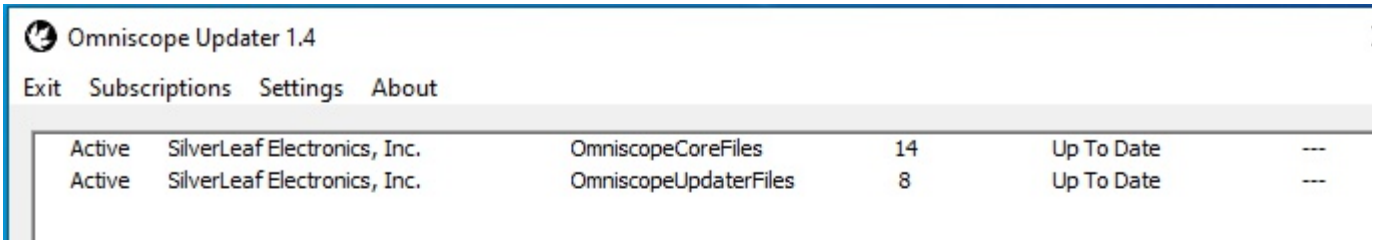
Subscriptions:

Subscriptions only apply to the "Standard Version". The "Basic Version" does not use subscriptions.

Subscription keys enable advanced features. Subscriptions can be purchased from SilverLeaf Electronics. Paste the key into the key.txt file, located in the Omniscope folder. Subscription keys allow you to open Omniscope Updater.

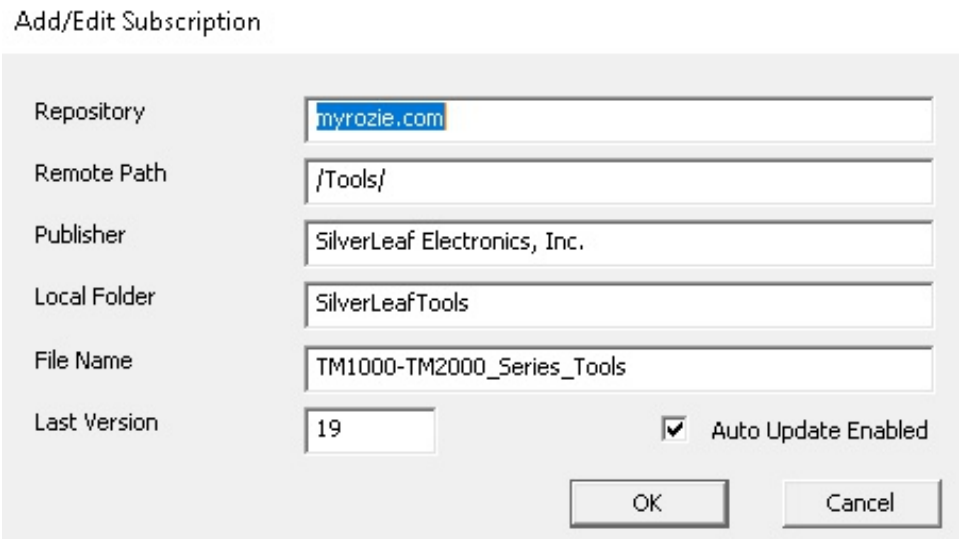
Omniscope Updater:

From the Omniscope front page, Select 'Options'. Select 'Updates'. Select 'Update now'. Omniscope Updater allows for managing subscriptions. A list of current subscriptions will be listed and updated at the beginning of each day.
Subscriptions can be managed by selecting the 'Subscriptions' tab. Select an existing subscription then press 'Subscriptions'. Pick from the list to create, import or edit subscriptions.



Select the 'Subscriptions' tab to manage subscriptions.

Here is a typical Subscription dialog for a tool. It shows the Repository where the files can be obtained and where they will be placed in the Omniscope folders. An Internet connection is required. Firmware, configuration, scripts and core subscriptions have they own source remote paths. The tool, firmware, script, etc will be placed in the "Local Folder" specified.
Check the "Auto Update Enabled" to check for updates.



Press 'Exit' then 'Exit and start Omniscope' to exit Updater and start Omniscope.

First time OmniScope initialization:

Select 'Options'. Select 'Connections Options'. Select 'USB Adapter Type'. Pick the one for your type of adapter box. FT or OB series. The one with four LEDs on the top is FT.

Select 'Connect' from the main screen. Select 'USB'. A check mark will appear.
The device list will appear if the module is connected.

Having trouble getting the device list? Try pressing 'Connect' then 'Disconnect' then 'USB'. The device list should appear. If not, press 'Options', 'Connection Options', 'USB adapter Type' then pick the FT or OB for you adapter type. Try again.

Common uses for Omniscope:

Troubleshooting:

One of the first uses, is to verify the Device list. Check for an absence of modules. Check for missing modules. These could indicate a power or RV-C network problem.
The 'Service Tool' is a virtual device.

Faults and Warnings:

Look at the device list, Active/Inactive, area. If it is red or yellow, there is a fault or warning being reported. The device reporting is listed in the Details area at the upper right. Select that line and double click on the 'Generic Diagnostic Code Reader' from the Available Modules in the lower right. A brief desciption can be found there. This gives you a hint as to where the problem is originating.

RVC Datalogger:

RVC Datalogger captures live messages from the RV-C data bus. These messages are being passed between modules and are a record of activity of the coach. Select the 'Service Tool' from the device list. Double click on the 'RVC Datalogger'. A stream of messages will be scrolling down the screen. To capture this stream, click on the icon at the right of the field in the upper right of the dialog box. A navigation window will appear. Create a folder and enter a file name to store the capture. Place a checkmark in the 'Record to Log File' box. While this checkmark is present, the data is being captured. You can perform actions in the coach, i.e. turning on and off a water pump, these messages will be captured in the log. Un-check the box to end the log. Open the log file created to see the messages.

TM102/TM1000 log:

The TM102/TM1000 keeps a log of the activity of the coach. These messages can be analyzed to aid in troubleshooting problems that have occurred. Select the 'System Clock' from the device list. This is the TM102 or TM1000. Select 'RVC Terminal' from the 'Available Modules'. Tap inside the screen and type ? A list of commands available will appear. Scroll to the one needed. The command 'nrec' will tell you how many messages are stored in the log. 'log' will allow you to access the log. Enter Log, the start address and the number of records needed. To capture a log, press 'Clear' at the bottom left to clear the screen. Type "log 1 100" as and example, to capture the first 100 entries. Change of the 'start' value will allow later periods of time to be captured. When finished, press 'Clipboard' at the bottom to copy the contents to the clipboard. The clipboard contents can be pasted into file for later analysis. Care is necessary, as the log can be very long and take minutes to capture.

Module settings:

Cloning module settings:

Settings for modules can be captured or set. Module backups for known good settings can be captured and saved to a file for later restoring. This allows settings changes to be tried, while allowing a known good setup to be retrieved. New modules can be programmed to the type of coach they will be used in from a standard setup. Locate the module from the device list. Find its tool from the Available Modules. Within the tool, look for 'Save Setting to Clone File' to create a "Clone" settings file. Create a folder and a name for use later. For loading settings, select 'Load Setting From Clone File'. Navigate to the location of the file on the computer. Select it and press 'Open'. Wait for it to complete. Reboot the module.

Module firmware:

A few types of modules can have their firmware changed through Omniscope. Firmware is the program operating the module, versus the clone file, which are settings. Control panel firmware can be changed. Firmware can change the look and menu system of the Control panel. Clone the setting before changing firmware. To change the firmware, select a Control Panel. Note the model of the Control Panel from the Details box. There can be more that one Control Panel. To verify which Control Panel will be changed, select the tool, from the Available Modules box at lower right. Reboot the Control Panel and observe if the desired Control Panel rebooted. Select the correct Control Panel if the wrong one rebooted. Select 'Firmware Downloading Tool'. 'Browse' to the firmware file. 'Start' will start the programming. Other than 'Abort', do not disturb the progress. Errors will occur. Let the process finish. Press 'Done' to exit. Reboot the Control Panel after the process is finished.

Many types of modules require other hardware and tools, other than Omniscope, to change firmware.