Controlling Drag Net products with AMX

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Overview

There are two ways to control a Drag Net device from an AMX system. Drag Net products can be controlled from AMX *NetLinx* equipment using Ethernet connectivity and control. Or use the Versatile Input Port (VIP) found on Drag Net products that support both Preset recall with switch closures and zero-to-five volt Level control.

[We hate listing things that our devices are *not*, (for example, a Rane RPM 88 is not a Ginsu knife), but, the RW 485 ports found on some Drag Net devices DO NOT communicate with AMX. They are solely for communicating with Rane's RW 485 remotes. It's time to evolve.]

Many AMX applications require simple Level control and/or Preset recall. This is most easily accomplished using the VIP (Versatile Input Port) found on all four Drag Net devices: RPM 26z, RPM 22, RPM 44 & RPM 88. There are always more Drag Net products coming - both hardware and software, so check our web site for the most recent list.

VIP Preset Recall. Connect a switch closure or relay to a VIP pin and short it to the ground (GND) pin to recall the corresponding Preset. For example, shorting VIP pin 1 to the GND terminal recalls Preset 1; pin 2 recalls Preset 2, etc. There are more details about this functionality in the Drag Net Help file and on our Drag Net applications page at

www.rane.com/dnapps/html.

Be certain to appropriately set the PR Assignment (VIP Allocation) in Drag Net's Remote Map. If GND contention of two or more pins simultaneously occurs, the highest-numbered VIP pin takes precedence. For example, if pin 3 is shorted closed and pin 6 is then shorted to GND, Preset 6 is recalled. If pin 3 is closed and pin 2 is then shorted, nothing happens – Preset 2 is NOT recalled. This permits a hierarchy of Presets when using VIP pin closures for tiered priority paging. Since there are only 8 VIP pins, you can only recall up to 8 Presets using switch closure.

There are three ways to recall more than 8 presets. Use the Drag Net software Recall button which is only intended for the system installer/designer. Second, use the Rane SR 3 remote which can recall any 16 of the available 24 Presets. Third, use an Ethernet command from an AMX NetLinx product. See the attached example Main.axs and RaneRPM.axi *NetLinx Studio* files for details on doing this.

[When using Drag Net's Auto Mixer/Ducker block, you have the ability to link a VIP pin closure to a push-to-talk switch in a paging or boardroom application. When using the Ducker block in these applications, the VIP pins act independently provided you Group the appropriate VIP pin with the Auto Mixer/Ducker's Input in Drag Net's Remote Map. Again, see our Drag Net applications page (above) for examples.]

VIP Level control. Connect a zero to five volt DC voltage to a VIP pin from an AMX card to adjust any or all Level blocks placed in the Processing Map. Use Groups in Drag Net's Remote Map to link one or more Level blocks so they track each other when using a VIP pin. Be certain to appropriately set the PR Assignment (VIP Allocation) in Drag Net's Remote Map. When using VIP pins with Level blocks, set the minimum and maximum for each Level block by double-clicking it while it's in a Remote Map Group. This keeps the max and min burdens within the Drag Net device – BUT only when using the VIP.

Since you can Group any or all Level blocks in Drag Net's Remote Map, it's much easier to implement a stereo level control since the Drag Net device is burdened with the task of tracking many Levels. You can use this to your advantage when using VIP pins to adjust multiple zones or multiple levels. Since you can place the Level block anywhere within the Drag Net Processing Map, you can Group Level blocks at the input, at the output or anywhere in-between – just place the Level block where you want it.

NetLinx Hardware Basics:

Connect the rear panel 10Base-T Ethernet port on a Drag Net device directly to an Ethernet port on AMX NetLinx equipment [*not* the ICSnet, ICShub nor the Expansion Out port]. At first, use an Ethernet crossover cable. One is included with each Drag Net device, (hopefully you're not at the job site looking for the Rane box which you left and recycled back at the office). This is always the best way to begin when initially wiring a system since it eliminates potential network errors until you're successfully up and running and talking between the AMX and Drag Net devices. The most expedient way to know that your AMX code is talking to the Drag Net device when wired with a crossover cable is to recall a Preset via AMX NetLinx. When the Drag Net device successfully recalls a preset, it displays the most recently recalled Preset on its front panel LED display.

Once you know the AMX and the Drag Net devices are talking to each other with a crossover cable, connect both Ethernet ports into a network switch (not a repeater hub) using standard CAT5 Ethernet cables.

Software Basics

Obtain the *"Rane Drag Net AMX NetLinx code.zip"* file from Rane's web site. It contains:

1. NetLinx Studio Project file amx.pjs
2. NetLinx Studio Main.axs – example Drag Net RPM 44 system
3. NetLinx Studio RaneRPM.axi – the all-important, heavily commented Rane *include* file
4. Drag Net example configuration files; "AMX NetLinx Demo.r44" & "AMX NetLinx Demo.r44.mem"
5. Drag Net XML file "AMX NetLinx Demo.r44.xml"
6. "RaneTestSO#REV0.tpd" – the touch screen image for this example code

Rane's Drag Net devices use User Datagram Protocol (UDP). Despite the lack of AMX documentation on the subject, AMX NetLinx does support 2-way (bi-directional/acknowledged) UDP.

You may have heard that TCP is "better" than UDP because TCP ensures that a packet is delivered over Ethernet networks and UDP does not. Rane has written a synchronous UDP protocol for Drag Net which provides acknowledgement, packet re-ordering and verification to render our UDP implementation extremely worthy of the task. Since UDP is connectionless (you cannot keep the "connection" open like TCP), you must establish an acknowledged "connection" with each and every communication packet sent between devices. And just like RS-232 communications, diligent programmers send changes to a device, then ask the device what the data is within the device, just to verify that the device accepted the change. Note that this is one step better than assuming or verifying that the data was delivered correctly over the potentially complex network. While TCP may guarantee that the data packets are delivered, it will not verify that the device accepted and interpreted them correctly, which the above approach will do. This is no different than the diligent RS-232 programming approach of yore.

TCP requires significant overhead and management, but UDP, being connectionless, requires much less. Since Drag Net devices have very small amounts of data to exchange between the PC/controller and the device (compared to many network devices at least), using UDP saves a lot of processor time and greatly simplifies the requirements.

A FEW RANE DEFINITIONS: (please read at least the *PID* definition below)

Block (or processing block) - a graphical and software code element within Rane's Drag Net software and hardware. The graphical elements are found in the Palette window and in the Processing Map area of Rane's Drag Net software. Here's one now…

Btypes (or Block Types) - associated with each Block are a group of parameters Rane call PIDs. Each Block in Drag Net has a default Btype value – each Level block, for example, is Btype $180 (decimal 384). All occurrences of Level blocks use the same Btype, but each placed block is uniquely identified with a PID value that is assigned by Drag Net when you drop it on the Processing Map.

PID (Processing block IDs formerly called Parameter IDs) - the numeric values within a Drag Net device or configuration file that point to a specific block's group of indexed parameters. You'll need to know the unique PID number of each block that contains a parameter that you wish to control through NetLinx. To view a block's PID, draw the Processing Map you want in Drag Net, save it, then select Generate Report from Drag Net's File menu. After you verify you'd like the XML report to be generated, your default web browser is opened and the XML file is loaded so you can search for the PID number(s) you'll need in the AMX code. See the RaneRPM.axi NetLinx Studio file for more details.

Processing Map - The area in Drag Net software where one draws the audio signal processing flow using blocks and wires.

Remote Map - The area in Drag Net software where one sets up the Remote functionality. The Level blocks previously placed in the Processing Map appear in the Palette when viewing the Remote Map. Once Levels are placed in the Remote Map's Groups, one can set max and min values for each Level block occurrence. The max and min are then enforced by the Drag Net device when using the VIP pins to control Levels.

Script - In Drag Net, one must Transfer a device configuration from your hard drive (Storage file) into a Live device. During a transfer, we send/receive what Rane calls a "script" file to/from the device. This script file contains all the blocks, wires, PIDs, parameter values, DSP code, Presets, Remote Map data, etc. for everything in a Drag Net device.