



Instructions for Installation and Configuration of a SRAP DSP Board into a Legacy GRC Controller

The SRAP DSP board (D20659-AC or DC) can be used as a direct replacement for any existing legacy SRAP board. One of the features of the DSP version is the elimination of the majority of the dip switches that were located on the board. These DIP switch settings are now stored in Non-Volatile memory and are programmed via the keypad/display module (HHP) on the door of the enclosure. They are easily backed up and restored via the SD-Card interface on the board.

The firmware in the HHP will have to be updated to version 5.09 or higher, which is available on the NWL FTP site along with a detailed procedure on how to perform the update. Please contact NWL if you require instructions on accessing to the site.

Installation

Prior to replacing the SRAP board, scroll to the SRAP screen and record the parameter settings in the Rapper Setup screen for the specific SRAP board number being replaced. The configuration of the Dip switches will also be needed to configure the new board.

De-energize the circuit breaker on the GRC cabinet. Loosen the screws that hold the boards in the cage captive and remove the SRAP board. Slide the new DSP board into the cage, insuring that the edge connectors are properly seated in the backplane.

The board address for the S-RAP DSP (D20659-AC or DC) is now set by two 10 position rotary selector switches as opposed to the prior DIP switches which required the user to be knowledgeable of binary coding. The upper switch will be used to set the first address digit (0-6) the lower will be used to set the second address digit (0-9) which will combine to set the board address within the allowable range of 01 to 64. For example to set a board address to 26 the upper switch will be set to 2 and the lower set to 6.

The board address of the original board can be determined by the setting of dip switch 8. Below is the table of the switch settings.

S-RAP board address	Rapper outputs range	Switch 8 position							
		1	2	3	4	5	6	7	8
1	1-16	x	x	0	0	0	0	0	0
2	17-32	x	x	0	0	0	0	0	1
3	33-48	x	x	0	0	0	0	1	0
4	49-64	x	x	0	0	0	0	1	1
5	65-80	x	x	0	0	0	1	0	0
6	81-96	x	x	0	0	0	1	0	1
7	97-112	x	x	0	0	0	1	1	0
8	113-128	x	x	0	0	0	1	1	1
9	129-144	x	x	0	0	1	0	0	0

S-RAP board address	Rapper outputs range	Switch 8 position							
		1	2	3	4	5	6	7	8
52	817-832	x	x	1	1	0	0	1	1
53	833-848	x	x	1	1	0	1	0	0
54	849-864	x	x	1	1	0	1	0	1
55	865-880	x	x	1	1	0	1	1	0
56	881-896	x	x	1	1	0	1	1	1
57	897-912	x	x	1	1	1	0	0	0
58	913-928	x	x	1	1	1	0	0	1
59	929-944	x	x	1	1	1	0	1	0
60	945-960	x	x	1	1	1	0	1	1
61	961-976	x	x	1	1	1	1	0	0
62	977-992	x	x	1	1	1	1	0	1
63	993-1008	x	x	1	1	1	1	1	0
64	1009-1024	x	x	1	1	1	1	1	1

Configuration

Once the firmware in the HHP has been updated to v5.09 or higher, the S-RAP DSP can be configured. Energize the GRC circuit breaker. Stop the rapping program if it is running by pressing the Start/Stop button on the HHP.

Sign On to the HHP and scroll to the S-RAP option on the main menu and press Enter.

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Monitor SignOff Program ACG T-Shoot
Setup POR PROGRAM S-CPU Help
-----
S-Rap: [ ] [v3.99 Comm OK] [240v MIGI]
-----
Device Type:240v MIGI Stand Alone:Enab
Relay Logic:n/a SW/Register:Dip
Lift Reg :Off NetPrtBaud:19200
SRAP Time :10:27:26 Init :00:05:00
SRAP Date :08/04/15 Cycle :00:00:16
Wait :00:05:00
ALARMS/STATUS
RAPPER SETUP SD CARD FUNCTIONS
LIFT TABLE RESTORE FACT DEF
-----
Program: OFF | MENU

```

Set the **S-Rap:** __ parameter to the address of the board being exchanged. Set the other parameters as defined below:

Device Type:

The device type setting is used for identifying the specific type of device that the S-RAP board will be energizing. Each board can only be configured for one type of device. All sixteen outputs will be expected to be operating that type of device.

The device type setting of the original board can be determined by the setting of dip switch 7. Below is the table for those settings.

Switch Setting	Description
0 0 0	120 V Migi
0 0 1	AC Vibrator
0 1 0	AC/DC Motor
0 1 1	DC Multi-Impact
1 0 0	DC Vibrator
1 0 1	T/R POR Outputs
1 1 0	240 V Migi

Using the (+) INCR or the (-) DECR pushbuttons, select the proper device type for that board. The options are: *120V Migi*, *AC vibrator*, *AC/DC motor*, *Multi-impact*, *DC vibrator*, *POR output*, or *240V Migi*. Press Enter.

Stand Alone:

The S-RAP boards can be configured to switch over to a standalone mode of operation communication with the S-CPU stops. Setting this parameter to *Dis* will disable this feature. Setting it to *Enab* will enable it. In this case each S-RAP will energize all 16 outputs sequentially based on a pre-defined schedule. Since each S-RAP is acting independently, it is important that these parameters be adjusted such that simultaneous rapping does not occur on a single power feed. Otherwise the power transformer fuses may fail.

The standalone option settings on the original board can be determined by the setting of switch 1. Below is the table for those settings.

Switch Setting	Description
0	Disabled
1	Enabled

The original board had the option of setting the standalone parameters via dip switches or internal registers. This was determined by switch 2.

Switch Setting	Description
0	DIPs
1	Registers

The new DSP board sets the parameters by internal registers only.

These standalone parameters are:

Init:

The initial wait time of the S-RAP board is defined as the “one-time” delay before initiating rapper activity. The initial wait time is useful for offsetting S-RAP boards

with identical timing. For example, S-RAP 1 and 2 both have a cycle time of 48 seconds (see Cycle time below). With an initial delay of 0, both boards will schedule rappers to fire at the same time. By assigning a 48-second initial wait time to S-RAP 2, S-RAP 1 will be completed firing before S-RAP 2 starts. Programmable from 00:00:16 to 02:00:00 in 16 second increments. *If a value other than a 16 second increment is entered, the system will automatically increase and/or decrease in the 16 second increment.*

Cycle:

The cycle time of a S-RAP is defined as the amount of time it takes to completely “cycle” through all sixteen outputs on the board. Rappers will be evenly spaced throughout a group’s cycle time. For example, a board with a cycle time of 48 seconds will attempt to fire a rapper every 3 seconds ($48 / 16 = 3$). Programmable from 00:00:00 to 23:59:59.

Wait:

The wait time of an S-RAP is defined as the amount of time to delay after the completion of a cycle period before restarting the cycle mode. For example, an S-RAP is assigned a wait time of 30 seconds. When the board completes the rapper sequence (fires all 16 rappers), it will “sleep” for 30 seconds and not attempt to fire any rappers. After the 30 second delay, the board will re-enter the cycle mode and attempt to fire the rappers again. Programmable from 00:00:00 to 23:59:59.

If the dip switch option was selected on the original board, the Initial Wait, the Cycle Time, and the Wait settings were determined by switches 3, 4, and 5 respectively. The tables for the settings are the same for all three switches.

Switch Setting	Description
0 0 0 0	0 minutes
0 0 0 1	5 minutes
0 0 1 0	10 minutes
0 0 1 1	15 minutes
:	:
1 1 1 0	70 minutes
1 1 1 1	75 minutes

Note: For *cycle time only*, a setting of 0 seconds represents a 16 second cycle time.

If the standalone settings on the original board were set by internal registers then those values which are readable from the HHP can be used on the new DSP board.

Lift Reg:

Lift regulation is useful if changes in the ambient temperature causes changes in the coil resistance of the device which causes changes in the lift. If the **Lift regulation** is *On* then the number of half-cycles of voltage applied to the device will be adjusted to achieve the

desirable Lift value; if the **Lift Regulation** is *Off* then the number of half-cycles will not be adjusted.

NetPrtBaud:

This parameter sets the baud rate for the network port on the S-RAP board. The possible settings are, *9600, 19200, 38400, 57600, and 115200*. **In order for the S-RAP to communicate with the NWL PCAMS and the older NWL S-CPU boards, the baud rate must be set for 19200. All boards in the system must be set to the same baud rate.**

SRAP Time:/SRAP Date:

The Time and Date are used when logging events to the SD card on the S-RAP DSP board. Enter the current time and date.

ALARM STATUS

This will display the same alarm display as the previous S-RAP card.

Monitor Setup	SignOff POR	Program S-RAP	ACG S-CPU	T-Shoot Help
S-Rap: 2		[Comm OK]	[DC Impact]	
1/OK	2/OK	3/OK	4/UC	
5/UC	6/OK	7/OK	8/OK	
9/OK	10/OK	11/OK	12/OK	
13/OK	14/OK	15/OK	16/OK	
CLEAR ALL ALARMS				
				RETURN
0	0	0	0	ALARMS

RAPPER SETUP

This will display the same setup page as the previous S-RAP card.

Monitor Setup	SignOff POR	Program S-RAP	ACG S-CPU	T-Shoot Help		
S-Rap: 2		Lift Reg: Off	[DC Impact]			
Rap#	Lift	Frg	Int	Duration	UC	OC
1	4.0	200	5	00:00:00	00	30
2	4.0	200	5	00:00:00	00	30
3	4.0	200	5	00:00:00	00	30
4	4.0	200	5	00:00:00	05	30
5	4.0	200	5	00:00:00	05	30
6	4.0	200	5	00:00:00	00	30
7	4.0	200	5	00:00:00	00	30
8	4.0	200	5	00:00:00	00	30
				RETURN		
39	0	0	0	0	0	ALARMS

Enter the parameter settings that were recorded from the original S-RAP board that were recorded prior to its replacement. If the standalone option on the original board was set to dip switch, the lift was determined by the switch 6 table below.

Switch Setting	DC Impact	AC/DC Vibrator & DC Multi-Impact	AC/DC Motor
	Lift (inches)	Duration (seconds)	Duration (minutes)
0	4	2	5
1	8	4	Fire All Continuous

Stand-Alone Operation Defaults

DC Impact	Number of Times in Sequence = 1
AC Vibrator	Intensity = 100%
DC Vibrator	Intensity = 100%
DC Multi-Impact	Intensity = 100%, Frequency = 300 CPM
AC/DC Motor	Intensity = 100%

LIFT TABLE

This will display the lift table for the rapping device that the board is configured to.

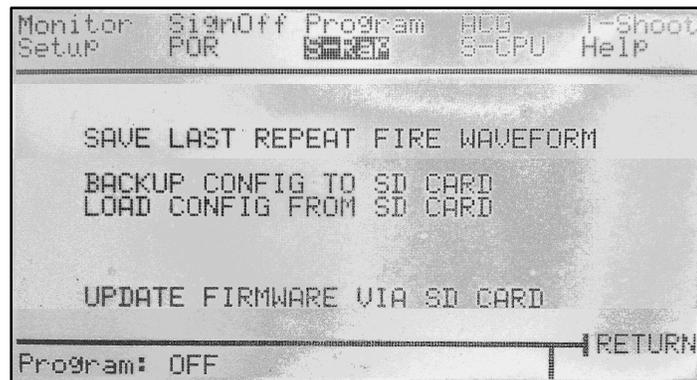
SD CARD FUNCTIONS

Each S-RAP DSP board also has provisions for a 2 or 4 GB SD memory card. The card is located below the two rotary switches for setting the serial address.

The card contains the following files:

- User Saved Configuration file (USERHREG.CSV)
- Auto Saved Configuration file (HREG.CSV)
- Event Log (NWLLOG.CSV)
- Waveform file (WAVE.CSV)
- Diagnostic file for NWL use (DIAG.CSV)

The SD Card Function will display the following screen.



SAVE LAST REPEAT FIRE WAVEFORM

The S-RAP is capable of saving the data points of the current waveform of the last device operated in the Repeat mode to the SD card. This file is in a .csv format and can be copied to another computer to generate a plot of the waveform.

Start going to the T-Shoot screen and placing the desired output in the Repeat mode. Operate in this mode long enough to energize the device. Return to the above screen and press Enter on the highlighted **SAVE LAST REPEAT FIRE WAVEFORM** and the data is transferred to the SD card in a .csv file format.

BACKUP CONFIG TO SD CARD

Press Enter when highlighted to backup the S-RAP board configuration to the SD card.

LOAD CONFIG FROM SD CARD

Press Enter when highlighted to load the configuration parameters from the SD card to the S-RAP board.

UPDATE FIRMWARE VIA SD CARD

This is used to update the firmware in the S-RAP card. The update procedure is as follows:

1. Download the new application firmware hex file from the FTP site and copy it to a 2 or 4 GB SD card.
2. Turn the rapping program off by pressing the *Stop* button.
3. Force an automatic save of the S-RAP parameters to the existing SD by turning the main circuit breaker off, waiting approximately 30 seconds, then turning the breaker back on.
4. Remove the SD card from the S-RAP board and insert the new SD card with the new application firmware.
5. Go to the **SD CARD FUNCTIONS** display shown above and press Enter on the highlighted **UPDATE FIRMWARE VIA SD CARD**.
6. A window will pop up to confirm that you want to update the S-RAP firmware. Press Enter.
7. The S-RAP will automatically load the new firmware. During the loading process there will be a loss of communications indicated. Communications will be re-established once the process is complete.
8. Turn off the main circuit breaker.
9. Remove the SD card and insert the original card with the saved parameters.
10. Turn the main circuit breaker on.
11. The **S-RAP** screen should now indicate the new S-RAP firmware version number. The saved configuration parameters will automatically be loaded to the S-RAP board.

RESTORE FACT DEF

All of the S-RAP parameters can be restored to the factory default values by pressing Enter when this line is highlighted. A confirmation window will appear.