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NetLinx Programmer Certification Exam Grading Sheet

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Class Start: 10/01/2007
Location: AMX West Regional Office

Device Addressing

☒0: 3:0 TCP/IP Server
☒128:1:0 Touch Panel
☒5001:1:0 Switcher
☒5001:2:0 Projector
☒5001:3:0 DVD Player
☒5001:4:0 Camera
☒5001:4:100 Camera of System 100
☒5001:7: Relays
- ☒Channels 1-3 Projection Screen
- ☒Channels 4-5 System Power

☒5001:8:0 Display Monitor 1
☒5001:9:0 Display Monitor 2
☒5001:10:0 VCR
☒5001:11:0 CD Changer

Notes: Good job.

Device Configuration in Data_Events

☒5001:1:101 Switcher 38400,N,8,1
☒5001:2:101 Projector 38400,N,8,1
☒5001:3:101 DVD Player 9600,N,8,1
☒5001:4:101 Camera 38400,N,8,1
☒5001:8:101 Display Monitor 1 IR mode, Carrier on
☒5001:9:101 Display Monitor 2 IR mode, Carrier on
☐5001:10:101 VCR Serial mode, Carrier off
☒5001:11:101 CD Changer IR mode, Carrier on

Notes: VCR is set to SET MODE IR instead of SERIAL. IR ports have three different modes: IR, SERIAL and DATA. Please make sure to select the proper mode or the device will not work correctly. It's a simple thing to overlook but can have a detrimental effect on the whole system.

Device Control

☐Switcher

- ☐Correct use of protocol
- ☒Proper usage of BUTTON_EVENT for control
- ☐Proper usage of DATA_EVENT for string handling

Notes: Please review the protocol specification again. The protocol requires $02 as a prefix and $03 as a suffix. They are both hexidecimal units and not ASCII characters. Therefore, both the prefix and the suffix should be outside the single quotes to denote that they are not ASCII characters. Only the first BUTTON_EVENT for input 1 and output 1 is sending the command with the proper format.

☐Projector

- ☒Correct use of protocol
- ☒Proper usage of BUTTON_EVENT for control
- ☒Proper usage of DATA_EVENT for string handling

Notes: All the variables are tracking well but there are few unnecessary ones does not need to be here because they are not specified in the handout. For example, nLampWarm, nProjWarm and nProjCool are states that do not apply to this particular device so they should be left out. Another recommendation is to use a single variable to track the input choice. There are two choices but only one can be selected at once so using just a single variable makes more sense. Last but most important, there is no feedback for any of the buttons. Lamp On/Off button flashing while cooling down is the most important feedback required in this exercise but none of the other buttons have feedback as well.

☐DVD Player

- ☐Correct use of protocol
- ☒Proper usage of BUTTON_EVENT for control
- ☐Proper usage of DATA_EVENT for string handling

Notes: There are a lot of good things happening here but there are also few mistakes preventing the process from working correctly. First, arrays chrCmds_CDMenu and chrCmds_DVDMenu are not storing data correctly. The current declaration has all the hexidecimal numbers stored in a single dimensional array. There is no logical 3-number grouping here. In order to achieve that grouping then both arrays need to be declared as two dimensional arrays and store one command (3 hex numbers) into one row each. For example, chrCmds_CDMenu[3][3] = { {$20,$20,$0D}, {$20,$21,$0D}, {$20,$21,$0D} } will store all the numbers

in a nice table format. Second, the IF statement in the STRING event is looking for '$11, ' when it should be looking for a hex number $11. Once again $11 is a hexidecimal number. Meaning this is a single byte number represented in a hex format. '$11, ' is a collection of five bytes. If things are still confusing please give me a call and we can talk about the differences. Lastly, the GET_LAST command inside the CD BUTTONS event is using the wrong channel array. It says GET_LAST(DVD_BTNS) but it should say GET_LAST(CD_BTNS).

☐Cameras (Systems 101 and 102)
- ☒Correct use of protocol
- ☐Proper usage of BUTTON_EVENT for control
- ☐Proper usage of DATA_EVENT for string handling

Notes: The specification requires 250ms of HOLD time and then start repeating the command every 50ms. The current HOLD event waits 300ms and then waits an additional 500ms before sending a command. As a result, each command is going out every 800ms instead of what is required. There are a lot of different ways to get the answer but I will go over two. First, make the HOLD event wait 200ms and don't make it repeat. Create a TIMELINE that repeats every 50ms inside the HOLD event. Have the TIMELINE_EVENT send out the proper camera control command. The second method, is to make the HOLD event wait 50ms and make it repeat. Inside the HOLD event, use BUTTON.HOLDTIME to check whether the event has waited 250ms before sending the command. Make sure to review TIMELINE, HOLD and WAIT statements because they have different time units. Once again, I am available if you need further guidance regarding the methods I proposed above.

Finally, I like how the TOGGLE TO CAMERA 2 event is handled but the DEV variable "cameras" isn't being used in any of the camera BUTTON_EVENTS so all the commands are always going out to the first camera and never to the second one. Please modify the camera BUTTON_EVENTs to take advantage of the DEV variable.

There should also be feedback based on the camera confirmations. This should happen in the STRING event. Check for an ACK and turn the camera buttons on and off.

☐Relays
- ☐Projection Screen operation
  - ☒Mutually exclusive operation of relays
  - ☐Proper usage of BUTTON_EVENT for control
- ☒System Power

☒Proper usage of BUTTON_EVENT for control
☒Proper timing of relay closures

Notes: There is one critical mistake in the screen operation. TOTAL_OFF command does not work with BUTTON.INPUT.CHANNEL. TOTAL_OFF is from AXCESS programming days so some of those old commands often do not play well with new NETLINX commands. This is one case. As a result, the command is not turning of the relays 1 or 2 as they should after 2.5 seconds.

☐Monitors

☒Correct use of IR Functions
☒Proper usage of BUTTON_EVENT for control

Notes: PUSH_CHANNEL is no longer recommended. Please use BUTTON.INPUT.CHANNEL instead. Last but not least, there is no feedback for any of the buttons. I recommend momentary feedback for most IR devices.

☒VCR

☒Usage of system call in DEFINE_PROGRAM

Notes: Good job. However, simply use a number instead of putting in a device name inside the square brackets. The number inside [ ] denote an instance number and it allows you to use multiple copies of a system_call on physically different devices without getting them mixed up. For example, all the VCR1 system_call code gets copied over to the main program when a SYSTEM_CALL command is used. If you have two VCR devices and you want to use the same type of SYSTEM_CALL for both of them then two exact copies of the SYSTEM_CALL will be copied over to your code. To prevent from two identical copies of code interfering with each other, an instance number is used to distinguish otherwise identical code.

☐CD Changer

☒Correct format of structure for CD info
☒Initialization of structure data in DEFINE_START
☐Correct formatting of SEND_COMMAND for variable text display

Notes: CD Info structure is not exactly to the specification but it does mirror a real life situation better so I will give you credit. I also believe the structure is supposed to initialized when the Master comes online, not when the IR port comes online. However, the loading routine is written well so I will give you credit for that. Three problems I do have with this block of code are… 1) use of PUSH_CHANNEL command. PUSH_CHANNEL is no longer recommended. Please use BUTTON.INPUT.CHANNEL instead. 2) no feedback for any of the CD

Changer buttons. Please provide at least momentary feedback so the user has a visual indication that something did occur. Feedback is a very important user experience. 3) All four text fields should be updated with various DISC related information whenever a new disc is selected. The current information tries to write everything about the DISC on one text field at a time. For example, all TXT commands for DISC 5 are sending the text to address code 94.

☐TCP/IP Server

☒Initialization

☐Data processing

Notes: The STRING event is missing its { } so if anything else other than the IF statement gets added then it will throw a syntax error. In addition, having a FIND_STRING for 'ping' will prevent anything from being process unless the message itself contains the word 'ping' in it which is not part of the specification. It also is a good idea to open up the server again when it is closed in the OFFLINE event so another connection can be made.

Overall Analysis of Programming Exam Practical

1st Attempt 35%

	Works Correctly	Needs Minor Adjustments	Did Not Work
Configuration			X
Switcher			X
Projector		X	
DVD			X
Cameras		X	
Relays		X	
Monitors		X	
VCR		X	
CD Changer		X	
TCP/IP		X	

This has been a very good solid first attempt. Please don't be deceived by the low score because I see a lot of good programming. I tried my best to describe the problems I see in each section in as much detail as I could but please feel free to contact me if you need some clarification on things.

Generally, there is a tendency to ignore feedback for the user throughout the program and this is not acceptable. Feedback is vital to the user experience as much as actually turning on the TV. Please keep that in mind when turning in

your next submission. Another thing I noticed was the confusion coming from hex numbers (ie. $10 or $0D) and ASCII characters looking like hex numbers (ie. '$10' or '$0D"). Hex numbers are single byte representation and ASCII characters are collections of single byte characters. For example, $01 is 0000 0001 in binary but '$01' is 0010 0100 0011 0000 0011 0001 in binary. As you can see, the first one is a single byte (8 bits) and the next one is four bytes (32-bits). To a computer they are completely different values. When a specification calls for a hex number, make sure to treat that data as such by not using single quotes around it. There are few other issues but they are minor. Please refer back to each section for more detailed explanation.

Once again, this was a good first attempt and I look forward to seeing the second submission. Please remember that the program will need 90% or better on its second attempt to pass so please test thoroughly before sending it in. You have another 30 days to turn in the practical. Good luck.

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