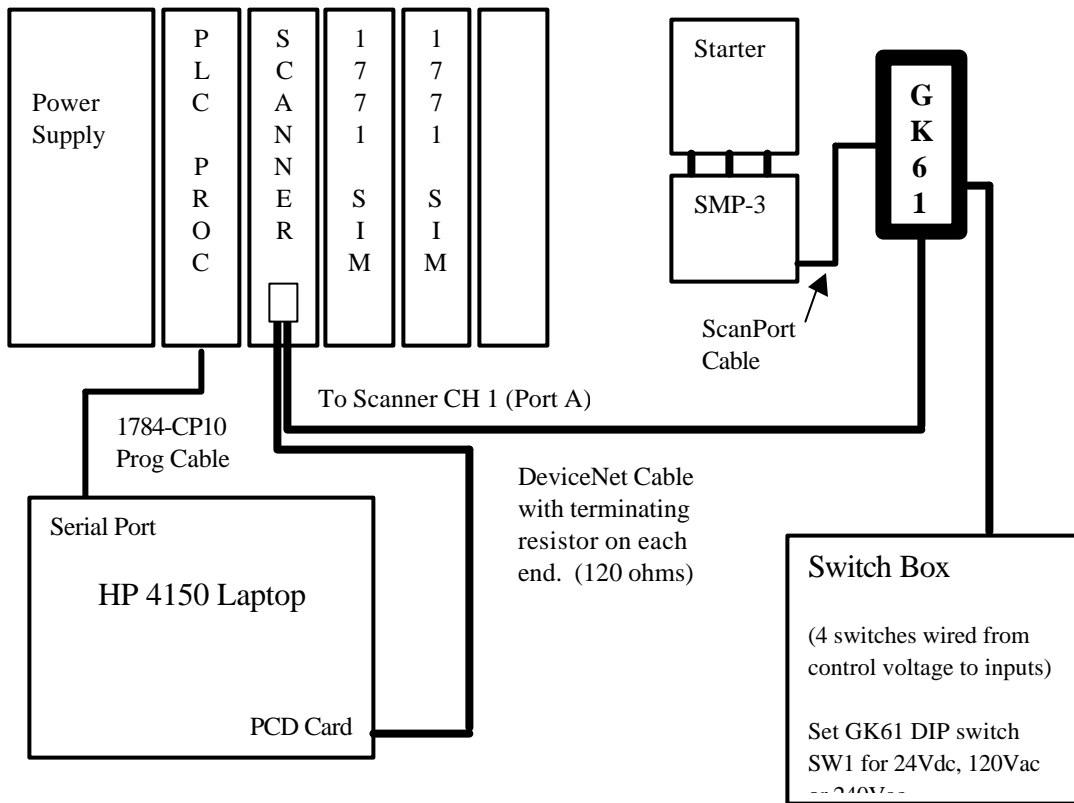


TECH NOTE – Reading 2100-GK61 inputs.

Explicit messaging is used to read GK61 inputs. An example program and explanation are used to illustrate the technique.

Hardware configuration for program example:



Equipment used for example program:

PLC 4-slot chassis with:

Processor Slot – PLC-5/20

Slot 0 – 1771-SDN scanner

Slot 1 – 1771-SIM card

Slot 2 – 1771-SIM card

External power supply

2100-GK61 DeviceNet to SCANport Communication Module with Digital Inputs

24V dc power supply

SMP-3 electronic overload relay

HP 4150 Laptop PC with:

1784-PCD DeviceNet card

PLC programming cable

RS Lynx software (communications drivers)

RS Networx for DeviceNet software (for configuring 2100-GK61 and scanner)

RS Logix 5 software (for programming PLC)

DeviceNet cable and 5 position connectors (for linking scanner, GK61 and PCD card)

ScanPort cable (for connecting GK61 and SMP-3) Part # 40121-487-02(A)

120 ohm terminating resistors (one at each end of cable across blue and white wires)

References:

Pub 2100-UM001A-US-P DeviceNet to SCANport Communication Module with Digital Inputs

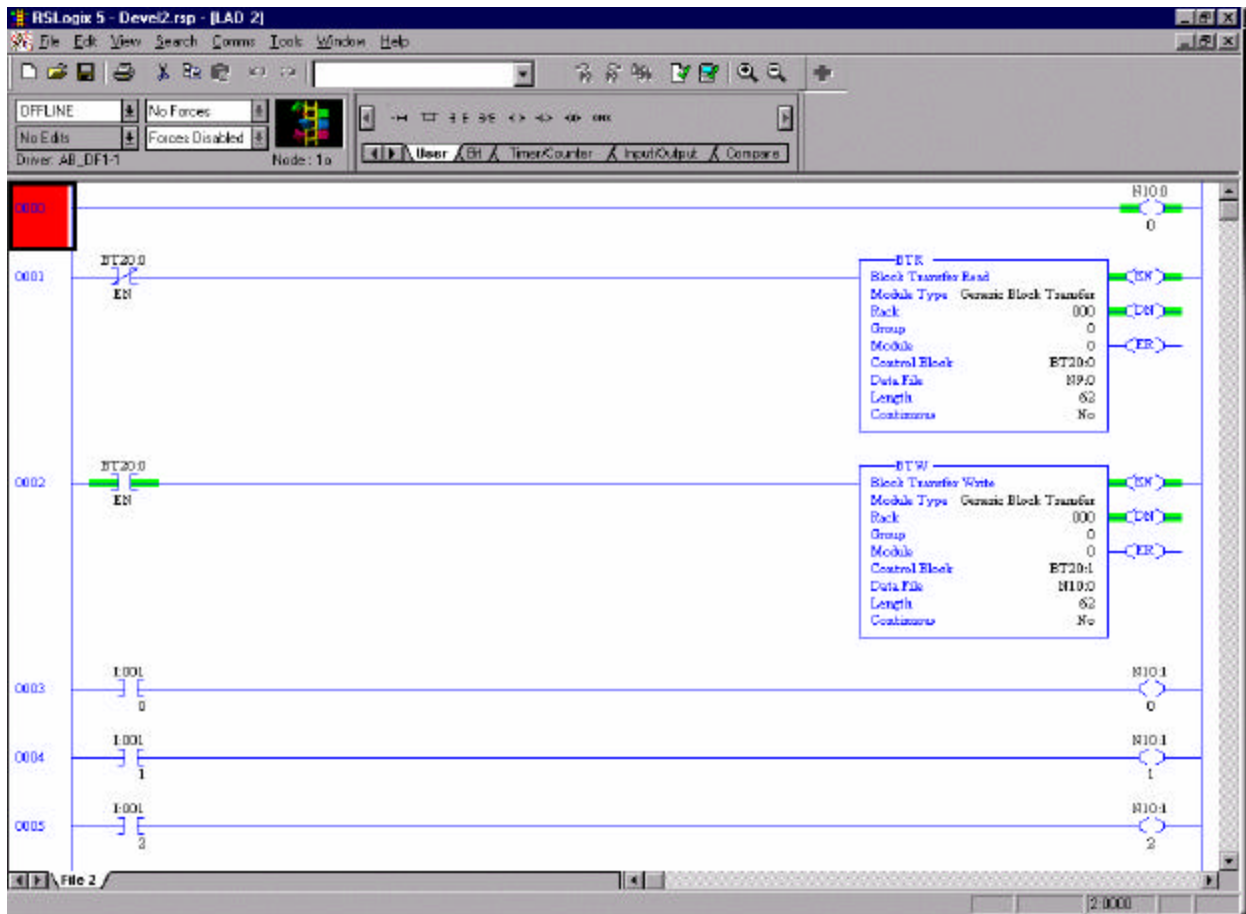
- Ch 4 – Configuring a scanner to communicate with the GK61 using RS Networx for DeviceNet.
- Ch 5 – Ladder Logic Programming. Focus is on Logic Control Data and Status Data.
- Ch 6 – Using DeviceNet Explicit Messaging. Ladder programming for reading GK61 inputs.
- Appendix B – DeviceNet to SCANport Communication Module with Digital Inputs Parameters. Information on setting node address and data rate.
- Appendix C – DeviceNet Objects – Includes details on Class Code 0x93 – SCANport Pass-Through Parameter Object used for reading GK61 inputs.
- Appendix E – Supported Emulated Block Transfer Commands. Last page pertains to reading digital inputs on GK61.

Pub 193-5.0 Bulletin 193/592 SMP-3 Solid-state Overload Relay User Manual

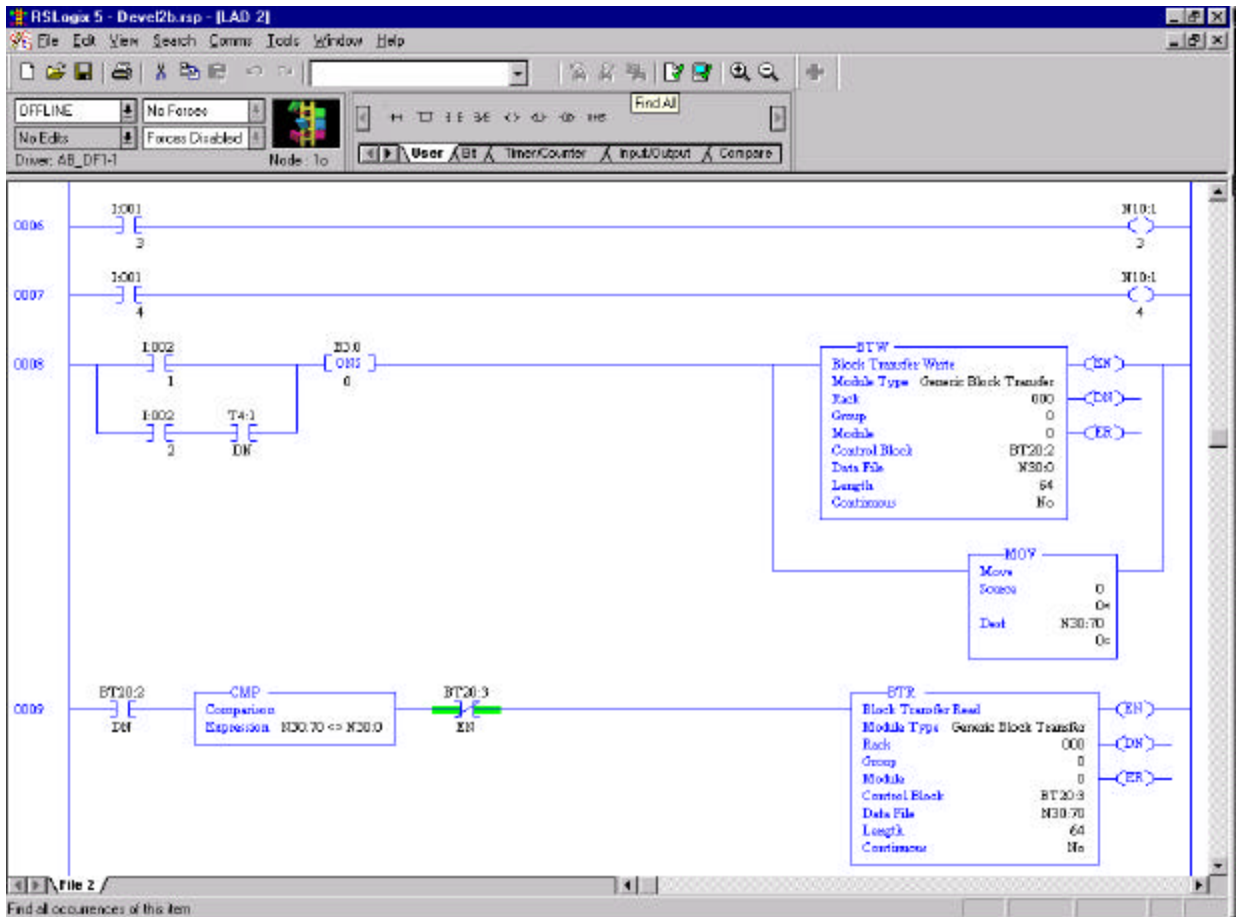
- Chapter 6 – Serial Communication – information on Logic Control Data and Status Data

Example Ladder Program Explanation:

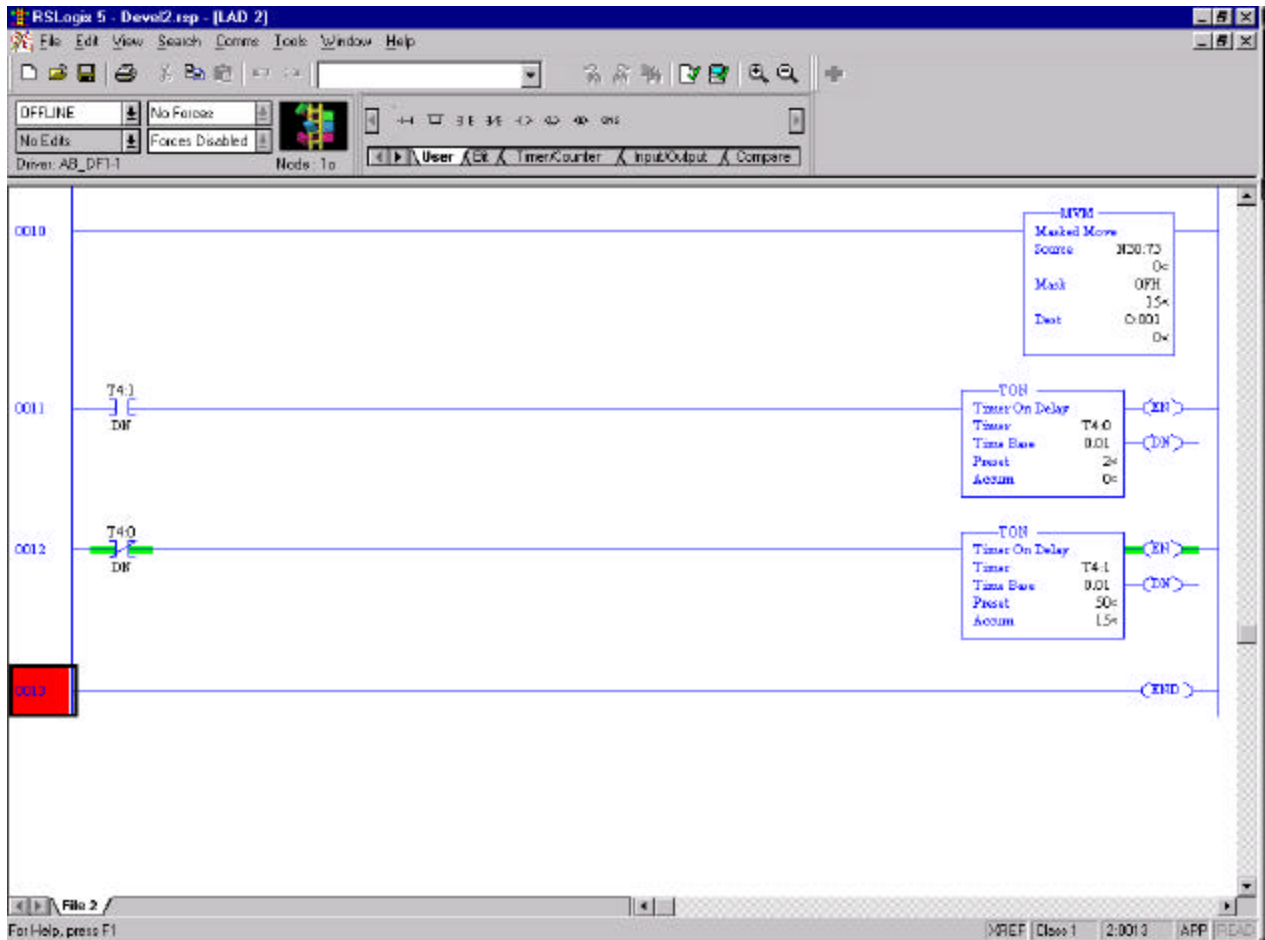
- Rung 0 – N10:0/0 enables 1771-SDN Scanner Port A.
- Rung 1 - BTR (Block Transfer Read) gathers SMP-3 Status Data via DeviceNet. The Block Transfer then moves the status data from the scanner to the PLC's N9 data file.
- Rung 2 – BTW (Block Transfer Write) sends SMP-3 command data to the scanner and out out to the SMP-3 via DeviceNet.
- Rung 3 – Turns off SMP-3 Output A (by momentarily turning on I:001 / 0)
- Rung 4 – Turns off SMP-3 Output B (by momentarily turning on I:001 / 1)
- Rung 5 – Clears SMP-3 Fault (by momentarily turning on I:001 / 2)



- Rung 6 – Turns on SMP-3 Output A (by momentarily turning on I:001 / 3)
- Rung 7 – Turns on SMP-3 Output B (by momentarily turning on I:001 / 4)
- Rung 8 – When I:002 / 1 is set to the true state, the next instruction, a one-shot block transfer Write, sends data to the scanner. The Move instruction then initializes the first word of the data file that is used by the block transfer Read instruction in the next rung. Alternatively, I:002 / 2 can be set true to enable a continuous read mode based on cycle rate of T4:1 / DN.
- Rung 9 – This instruction will be true when the block transfer Write has completed. The compare instruction that follows compares the first word of data sent from the scanner to the first word of data you send to the scanner. When the messaging function has completed, these two words will be equal.



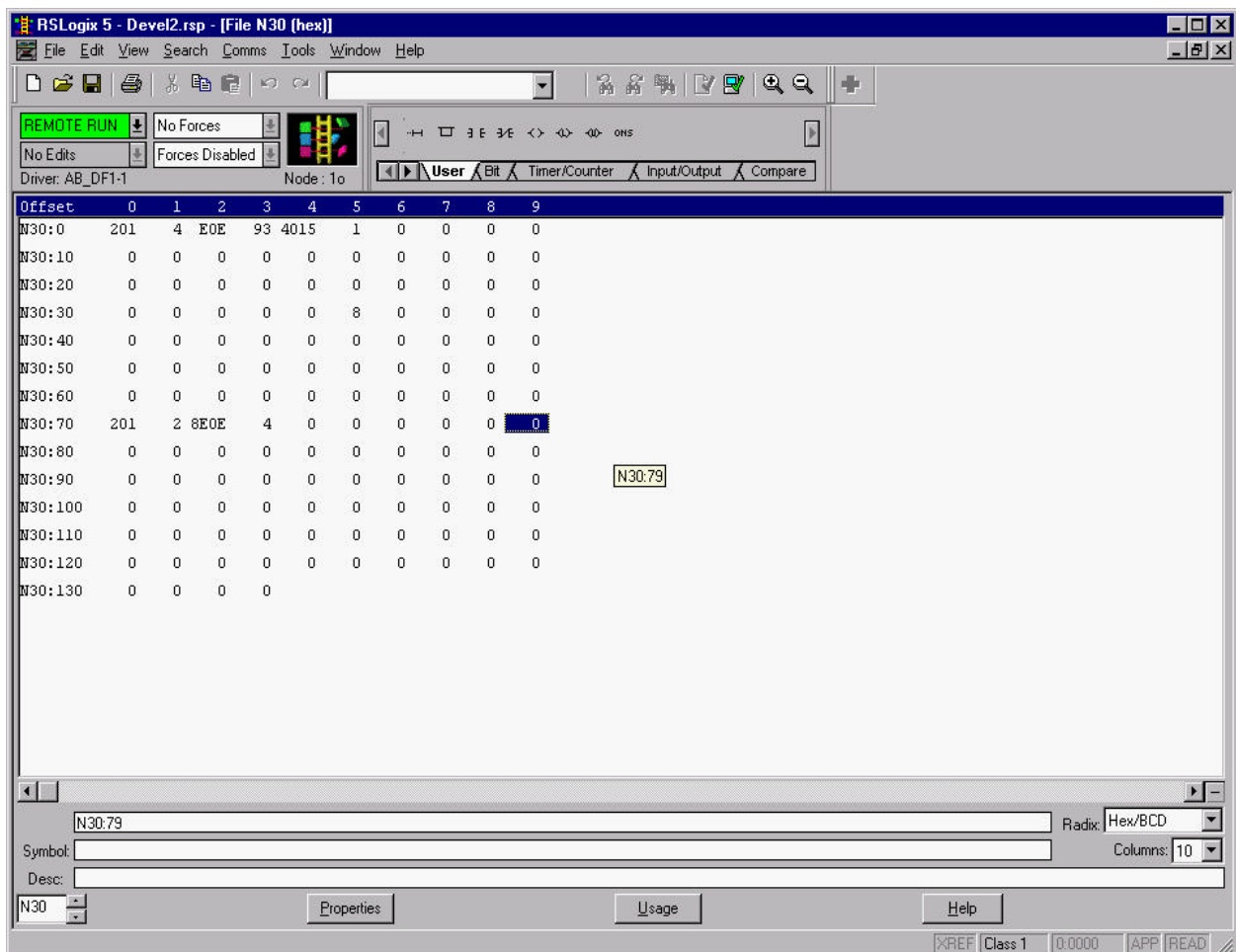
- Rung 10 – GK61 input status is read at N30:73 and sent to Output 001, a 1771-SIM card in slot 1. The hexadecimal mask 0FH transfers only the 4 least significant bits.
- Rungs 11 and 12 – Generator provides a 20 ms read pulse every 500 ms. T4:1 / DN must be enabled on Rung 8, previous page.



Allen-Bradley Drives

Data must be entered in N Register as shown below. Set Radix to Hex/BCD. A chart is provided on next page to convert decimal node numbers to hexadecimal format.

- N30:0 = 0201 (02 = transaction ID; 01 = Execute command)
- N30:1 = 0004 (00 = Port 0; 04 = word size of 4 bytes)
- N30:2 = 0E0E (Service 0E = Get Attribute Single; 2nd **0E** (**bold**) is Node number.)
- N30:3 = 0093 (0093 = class code – SCANport Pass-Through Parameter Object)
- N30:4 = 4015 (4015 = parameter number for GK61 inputs)
- N30:5 = 0001 (Attribute = 1)
- N30:70 = 0201 (02 = transaction ID; Status 01 = Success)
- N30:71 = 0002 (00 = Port 0; 04 originally typed in – PLC changed value to 02)
- N30:72 = 8E0E (Service 8E = Get Attribute Single; 2nd **0E** (**bold**) is Node number.)
- N30:73 = Results of GK61 input read. Data is in Hexadecimal format 0-F. 0 = 0000 (all bits off) F = 1111 (all bits on)



DeviceNet Node addresses in Decimal, Hexadecimal and Binary:

Decimal node number is in bold type. To right of decimal value is equivalent hexadecimal value used in N register locations N30:2 and N30:72. (See previous page.)

Node (Dec)	Node (Hex)	Node (Bin)		Node (Dec)	Node (Hex)	Node (Bin)
0	00	0000 0000		32	20	0010 0000
1	01	0000 0001		33	21	0010 0001
2	02	0000 0010		34	22	0010 0010
3	03	0000 0011		35	23	0010 0011
4	04	0000 0100		36	24	0010 0100
5	05	0000 0101		37	25	0010 0101
6	06	0000 0110		38	26	0010 0110
7	07	0000 0111		39	27	0010 0111
8	08	0000 1000		40	28	0010 1000
9	09	0000 1001		41	29	0010 1001
10	0A	0000 1010		42	2A	0010 1010
11	0B	0000 1011		43	2B	0010 1011
12	0C	0000 1100		44	2C	0010 1100
13	0D	0000 1101		45	2D	0010 1101
14	0E	0000 1110		46	2E	0010 1110
15	0F	0000 1111		47	2F	0010 1111
16	10	0001 0000		48	30	0011 0000
17	11	0001 0001		49	31	0011 0001
18	12	0001 0010		50	32	0011 0010
19	13	0001 0011		51	33	0011 0011
20	14	0001 0100		52	34	0011 0100
21	15	0001 0101		53	35	0011 0101
22	16	0001 0110		54	36	0011 0110
23	17	0001 0111		55	37	0011 0111
24	18	0001 1000		56	38	0011 1000
25	19	0001 1001		57	39	0011 1001
26	1A	0001 1010		58	3A	0011 1010
27	1B	0001 1011		59	3B	0011 1011
28	1C	0001 1100		60	3C	0011 1100
29	1D	0001 1101		61	3D	0011 1101
30	1E	0001 1110		62	3E	0011 1110
31	1F	0001 1111		63	3F	0011 1111