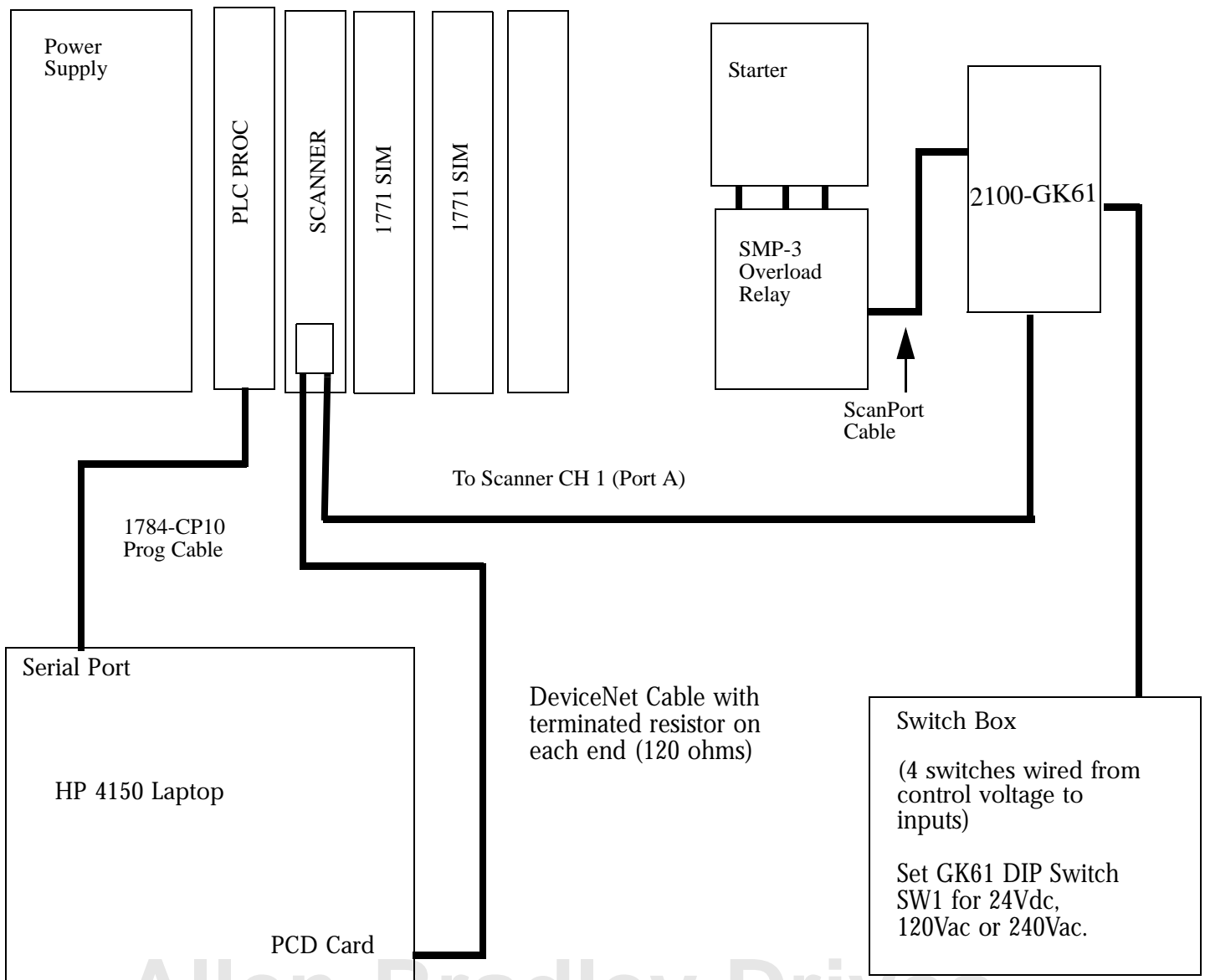




# Reading 2100-GK61 Inputs Using Explicit Messaging

Explicit messaging can be used to read 2100-GK61 inputs. An example program and explanation are used to illustrate the technique

Figure 0.1 Hardware configuration for program example.



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## 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

24Vdc power supply

SMP-3 electronic overload relay

Laptop PC (HP 4150) with:

- 1784-PCD DeviceNet card
- PLC programming cable
- RS Linx 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 2100-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

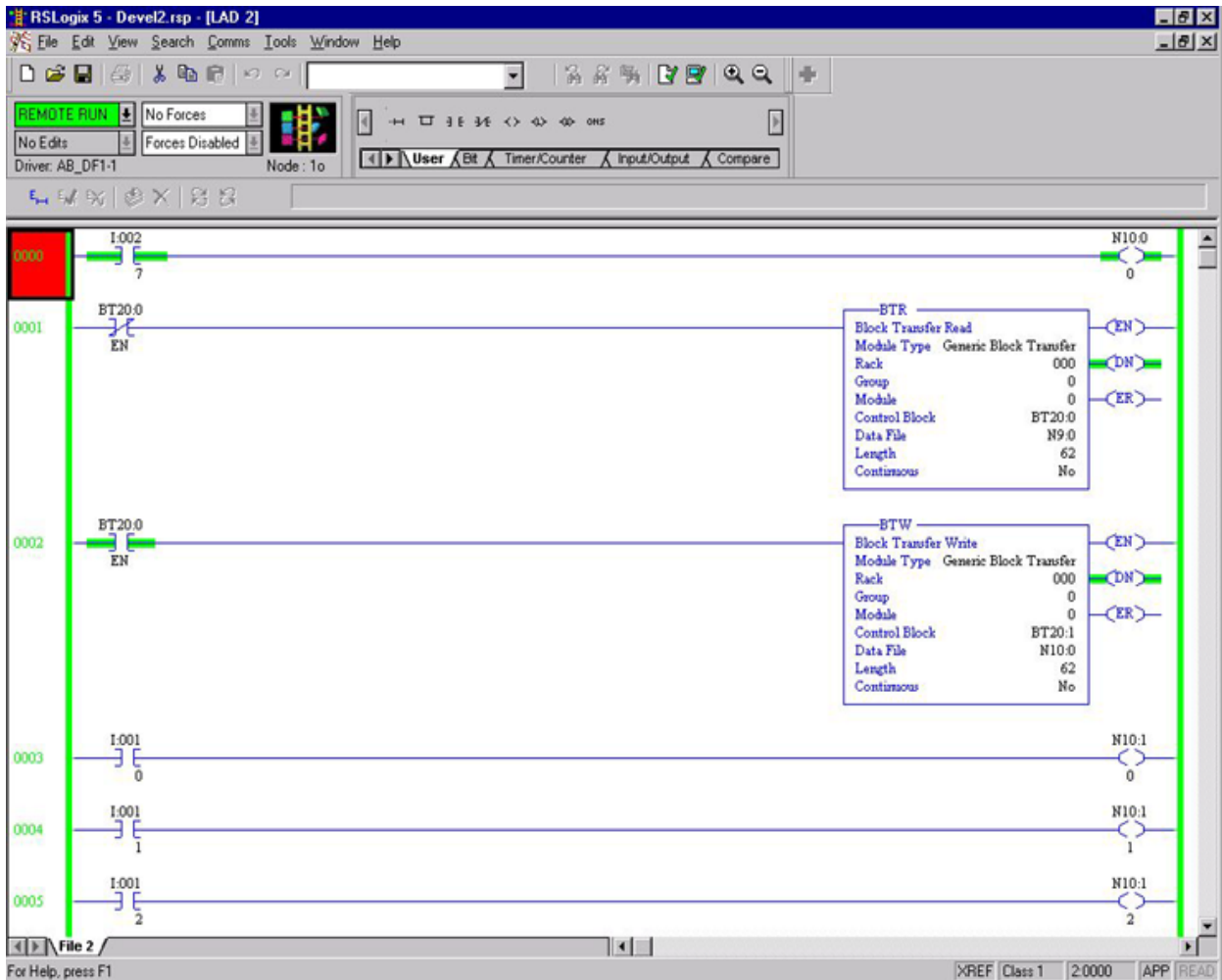
- Ch 4 – Configuring a Scanner to Communicate with the GK61 Using RS Network for DeviceNet.
- Ch 5 – Ladder Logic Programming. Focus is on Logic Control Data and Status Data.
- Ch 6 – Using DeviceNet Explicit Messaging. Ladder programming for reading GK61 inputs.
- Appendix B – DeviceNet to SCANport 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

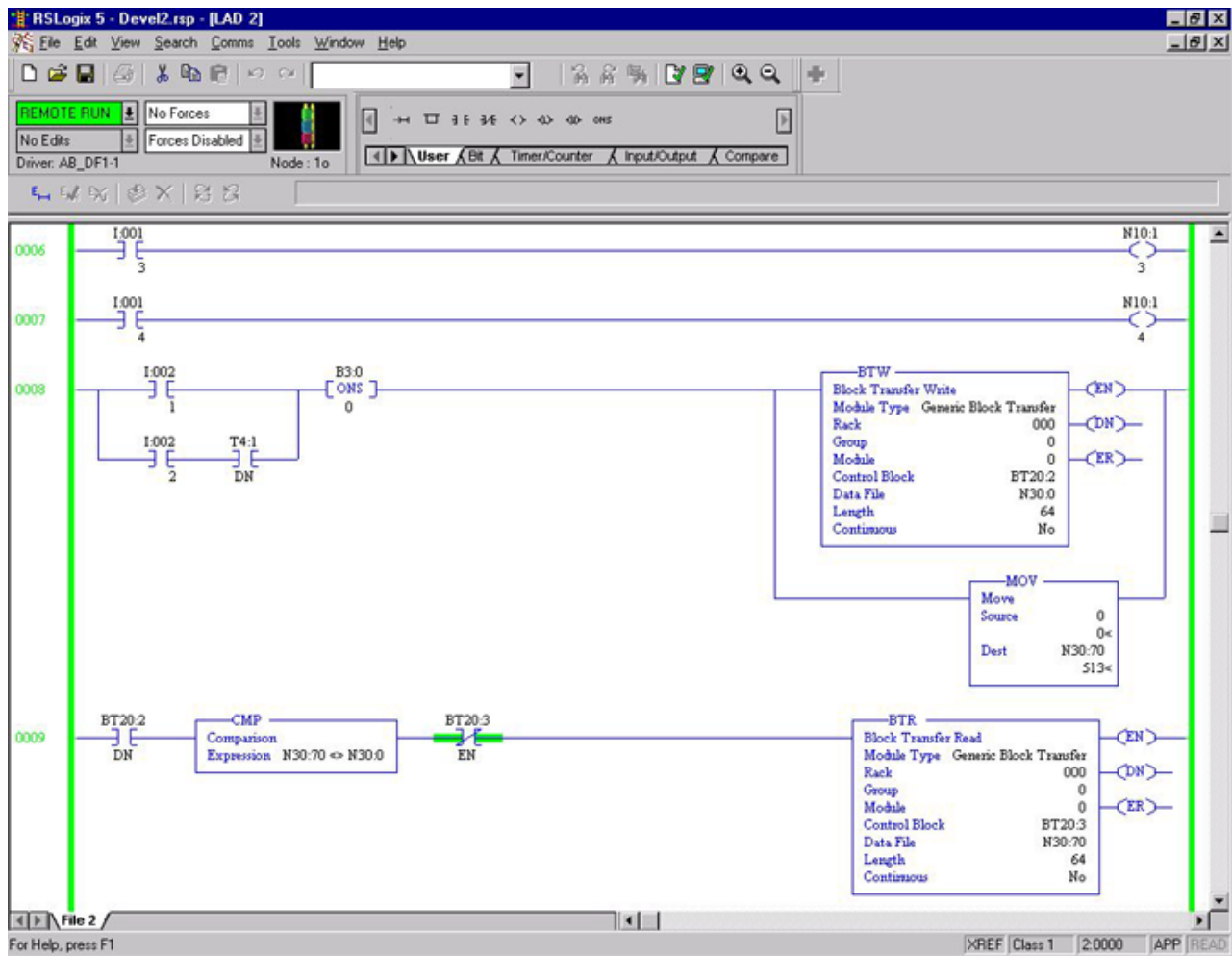
- Chapter 6 – Serial Communication – Information on Logic Control Data and Status Data

### 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 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).

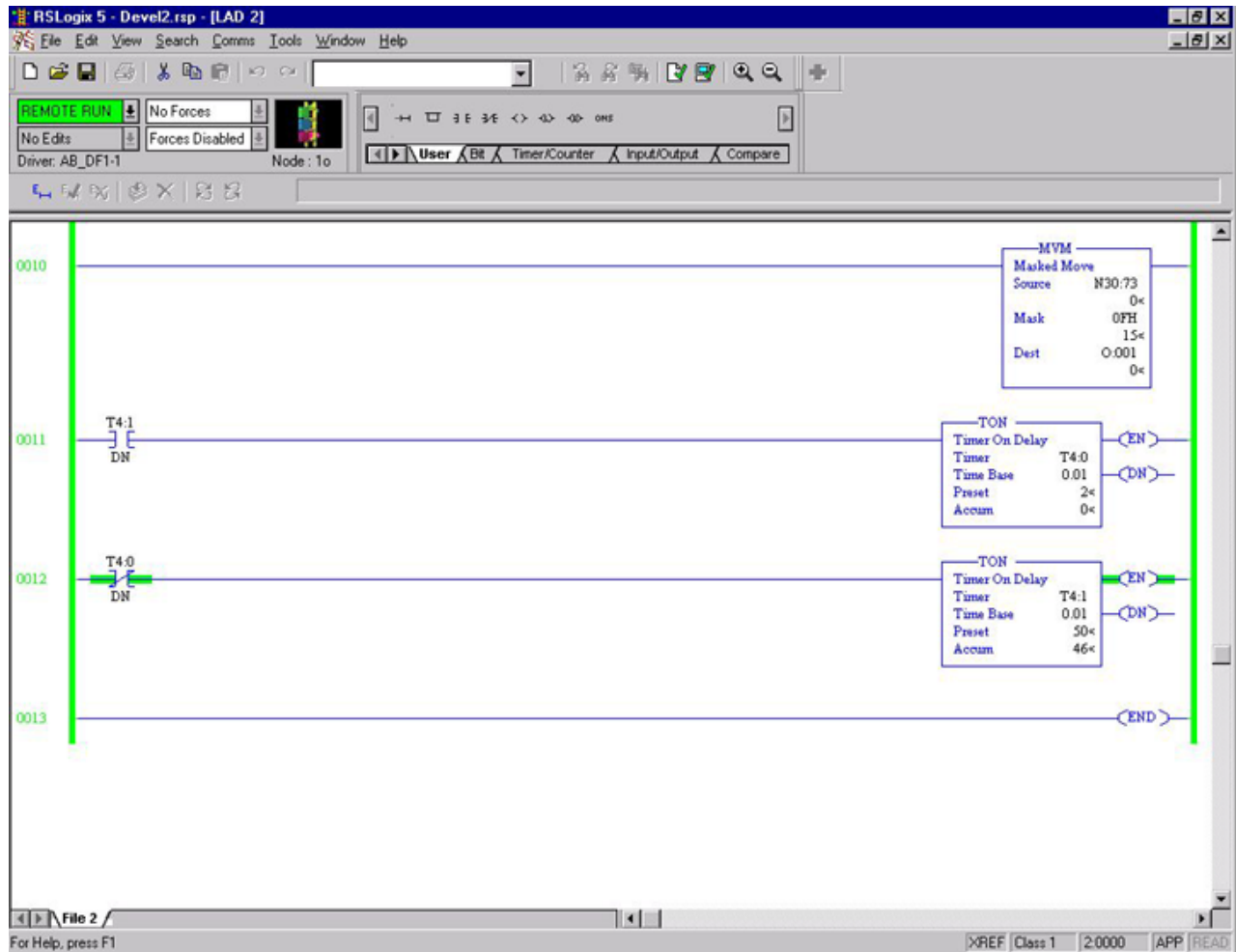


- Rung 6 – Turns on SMP-3 Output A (by momentarily turning on I:001 / 3).
- Rung 7 – Turns on SMP-3 Output B (by momentarily turning on I:001 / 4).
- Rung 8 – When I:002 / 1 is set to the true state, the next instruction, a one-shot Block Transfer Write, sends data to the scanner. The Move instruction 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.



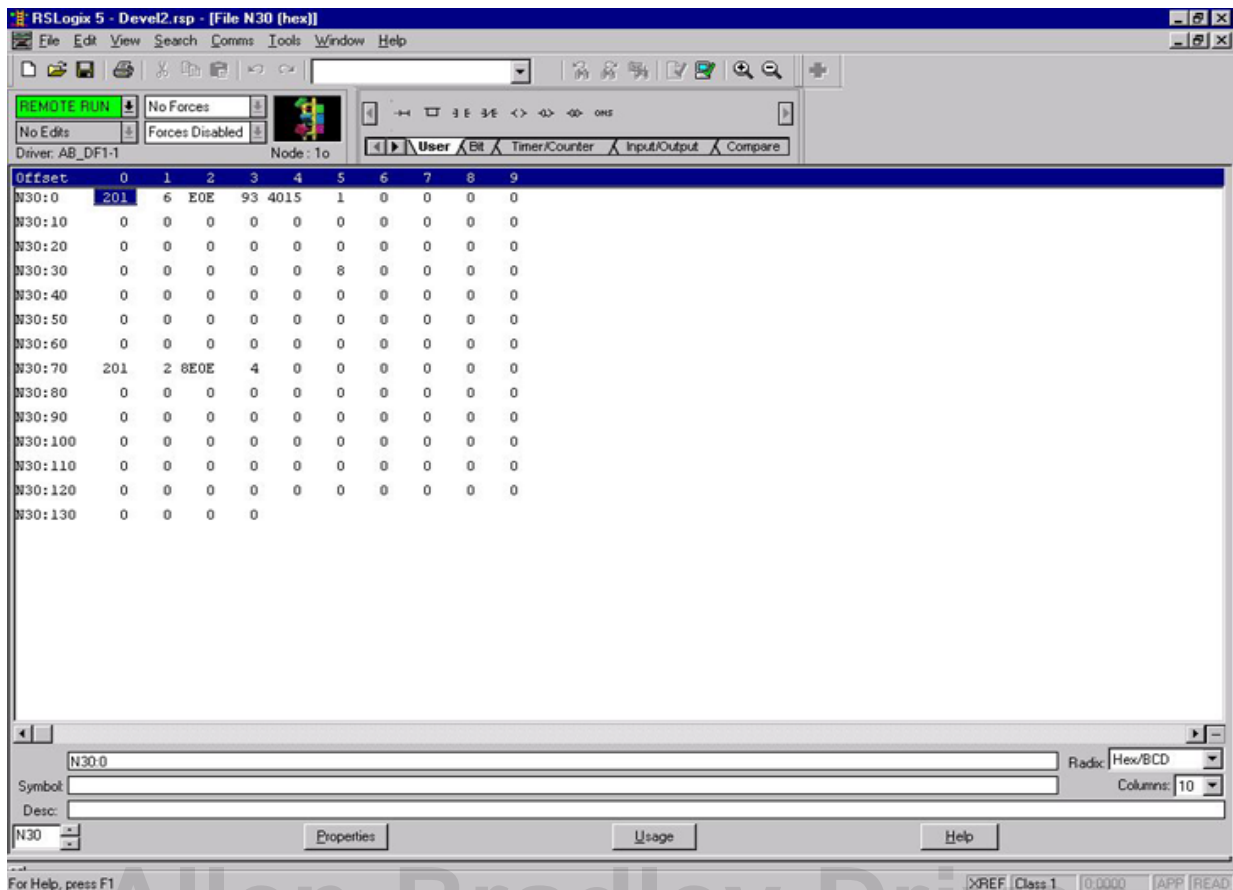
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- Rung 10 – GK61 input status is read at N30:73 and sent to Output 001, a 1771-SIM card in slot 1. The hexadecimal mask 0FH transfers only the 4 least significant bits.
- Rungs 11 and 12 – Generator provides a 20 ms read pulse every 500 ms. T4:1 /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



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 = 0006 (00 = Port 0; 06 = word size of 6 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



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## 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.)

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



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**Asia Pacific Headquarters**, 27/F Citicorp Centre, 18 Whitfield Road, Causeway Bay, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846

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