

**NEMTEK**  
www.nemtek.com



# Networking

with Druid Energizers and Smartcards



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# Introduction & disclaimer

## INTRODUCTION

The Nemtek Smart IO Card can be networked with a Druid 25 or Druid 28 electric fence energizer or with an 8-way Relay Board. It is recommended to be used with third party devices like alarm control panels.

This manual must be seen as a guide and not as a step by step instruction manual since networking will be different from site to site.

It is assumed that the installer has knowledge of networking and knows the Nemtek products used in the network.

Nemtek branches can provide training and product knowledge.

## DISCLAIMER

NEMTEK Holdings (Pty) Ltd or any of its subsidiary companies does not guarantee that the operation of the product will be uninterrupted or totally error free.

Energizer specifications may be altered without prior notification.

The installer must take into consideration the applicable municipal laws concerning the installation of electric fences. General guidelines are available, or refer to the website: <http://www.nemtek.com>. International standards can be viewed at <http://www.iec.ch> and South African standards on <http://www.sabs.co.za>.

### **GUARANTEE**

Products manufactured by NEMTEK, are guaranteed for a period of two years from date of sale against defects due to faulty workmanship or materials.

NEMTEK will, at its discretion, either repair or replace a product that proves to be defective.

NEMTEK guarantees that the product, when properly installed and used in line with the specification as determined by NEMTEK from time to time, will execute its function of generating a suitable potential. NEMTEK does not guarantee that the operation of the product will be uninterrupted and totally error free. Faulty units must be returned to one of the NEMTEK Group outlets. The buyer shall pay all shipping and other charges for the return of the product to NEMTEK or NEMTEK Security Warehouse.

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The guarantee does not apply to defects resulting from acts of God, modifications made by the buyer or any third party, misuse, neglect, abuse, accident and mishandling.

### **EXCLUSIVE REMEDIES**

The remedies provided herein are NEMTEK's sole liability and the buyer's sole and exclusive remedies for breach of guarantee. NEMTEK shall not be liable for any special, incidental, consequential, direct or indirect damages, whether based on contract, tort, or any other legal theory. The foregoing guarantee is in lieu of any and all other guarantees, whether expressed, implied, or statutory, including but not limited to warranties of merchantability and suitability for a particular purpose.

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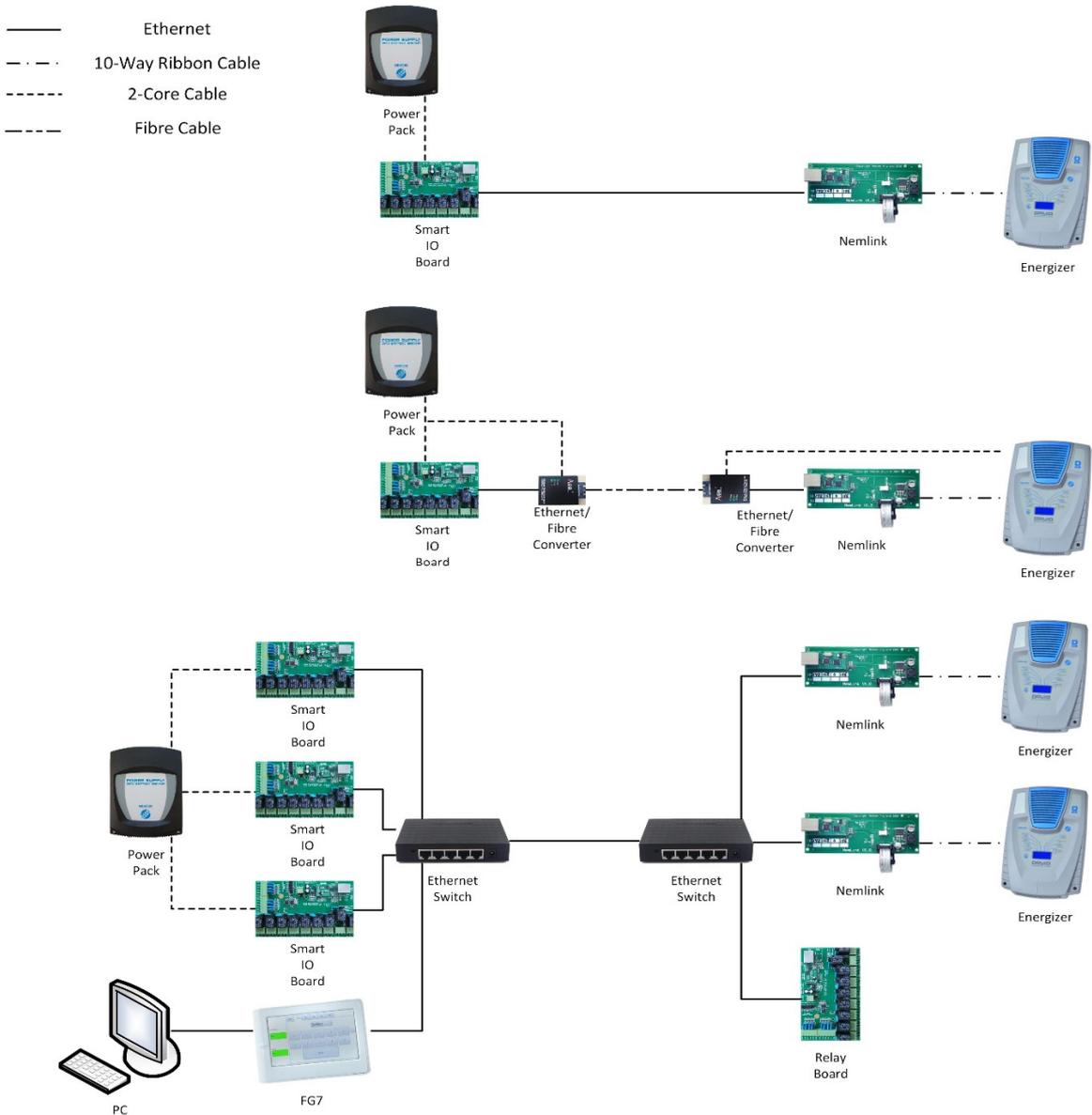
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Manufactured in South Africa

# 8-Way Smart IO Board Network

The NEMTEK 8-way Smart IO Board can be used for one-to-one communication to a Druid 2x energizer or 8-way Relay Board. This is useful where the energizer needs remote communication to a third-party device like an alarm panel. The board provides 8 inputs and 8 relay outputs that can be independently linked to different inputs and outputs of the energizer (or 8-way Relay Board), by using the software application. The figure below shows the possible connections. Although the boards and energizers are connected on an ethernet network in the third diagram, every Smart IO Board can only communicate to one energizer. In this network setup, the FG7 can only communicate with the energizers and not with the 8-way Relay board. The ethernet link between the two network switches can be replaced with an optic fibre link if longer distances are required. The NEMTEK Power Pack may be used to provide a 12 V supply with battery backup to the FG7 and 8-way Smart IO Board.



# Network Setup

To create a network apart from the physical connections the following steps are required:

1. Programming IP addresses for the Smart IO cards, Nemlinks and 8-Way Relay boards.
2. Configure addresses, jumpers and programming of Smart IO cards, Nemlinks, 8-Way Relay boards, FG7 and Energizers.

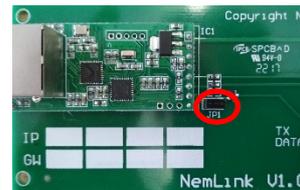
## PROGRAMMING IP ADDRESSES

The NEMTEK Ethernet Module provides network connectivity to various NEMTEK products. To set up the module successfully, follow these steps:

1. Download and save the USR-M0 setup software from <http://www.NEMTEK-druid-fenceprobe.com/downloads/USR-M0-V2.1.2.118.exe>
2. Install the jumper as per the relevant NEMTEK product shown in the figures below.



8-Way Relay Board JP3  
Ensure jumper installed on the 2 upper pins as in the figure.



NemLink JP1

3. Connect the Ethernet Module directly to your computer using a suitable ethernet cable.
4. Power up the NEMTEK board and ensure the green POWER LED is lit (For the NemLink board, power the board via either the J1 or J2 connector).
5. Run the USR-M0 setup software on your computer.
6. Click on the "Search Device" button.
7. A device should appear in the dialog box above the "Search Device" button. If no device appears check that the jumper is correctly installed, the ethernet cable is connected and that the board is powered.
8. Click on the device to display the device parameters.
9. If the module is still configured as factory default, the following parameters should be displayed:

# Programming IP Addresses

Base Param (which is without j, usually keep default)

IP Type j: Static IP

ModuleStaticIP j: 192.168.0.100

SubnetMask j: 255.255.255.0

Gateway j: 192.168.0.201

HTTP Port: 80

User Name: admin

Password: admin

Device Name: USR-TCP23

Device ID: 1

RS422  RS485

Index  Link  Send device ID when connected

Reset  RFC2217  Send data with device ID

Port Param

Parity/Data/Stop: NONE 8 1

Baudrate: 19200

Module work mode: UDP Server

Local Port: 20108

RemoteIP: 192.168.0.200

Remote Port: 20108

Enable USR Cloud

Device ID:  Communication code:

Save Config

10. If your NEMTEK network products are installed on a local, private network and the Nemlink is going to be installed on a Druid2x energizer or for the 8- way relay board, ONLY the "ModuleStaticIP" need changing, as explained in point 13.
11. For the Nemlink used with an FG7 or for the Nemtek Smart IO card, the base parameters below can be used and the "ModuleStaticIP" and the "RemoteIP" need changing.

Base Param (which is without j, usually keep default)

IP Type j: Static IP

ModuleStaticIP j: 192.168.0.150

SubnetMask j: 255.255.255.0

Gateway j: 192.168.0.201

HTTP Port: 80

User Name: admin

Password: admin

Device Name: USR-TCP23

Device ID: 1

RS422  RS485

Index  Link  Send device ID when connected

Reset  RFC2217  Send data with device ID

Port Param

Parity/Data/Stop: NONE 8 1

Baudrate: 19200

Module work mode: UDP

Local Port: 20108

RemoteIP: 192.168.0.100

Remote Port: 20108

Enable USR Cloud

Device ID:  Communication code:

Save Config

## Programming IP Addresses

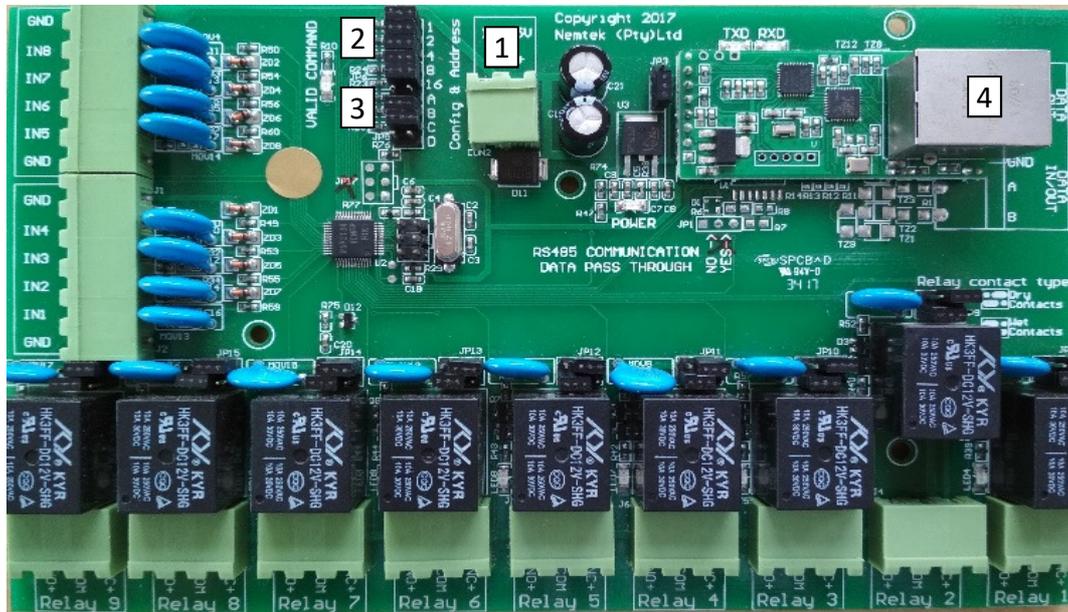
12. Large, public networks, including routing and remote access via an internet connection, are not covered by this guide. Please consult your network administrator.
13. Enter a new "ModuleStaticIP" adhering to the following criteria:
  - a. Every NEMTEK network device needs to have a unique "ModuleStaticIP" address. Devices cannot share the same address.
  - b. It is recommended that "ModuleStaticIP" are chosen from the range 192.168.0.1 to 192.168.0.254.
  - c. Ensure that all "ModuleStaticIP" addresses are in the same IP range. This means that for the range mentioned in (b.), the first 3 numbers (e.g. 192.168.0) of the "ModuleStaticIP" address must be exactly the same for all network devices and the last number may range from 1 to 254. An example of valid "ModuleStaticIP" addresses on the same network will be:
    - i. NEMTEK NemLink (connected to NEMTEK FG7): 192.168.0.150
    - ii. NEMTEK NemLink (connected to Energizer): 192.168.0.100
    - iii. NEMTEK 8-way Relay Board: 192.168.0.55
    - iv. Nemtek Smart IO card: 192.168.0.200
14. Enter a new "RemoteIP" adhering to the following criteria:
  - a. The NemLink board connected to the FG7, must have a "Remote IP" address of 192.168.0.255. in which the first three numbers must be exactly the same as the first three numbers of the IP address of the energizers and the last number must be 255
  - b. The Nemtek Smart IO card only communicates with one energizer so its "RemoteIP" must be identical to the "ModuleStaticIP" of the energizer it communicates with.
  - c. With reference to the "ModuleStaticIP" addresses in the examples above the following is an example of valid "RemoteIP" addresses on the same network:
    - i. NEMTEK NemLink (connected to NEMTEK FG7): 192.168.0.255
    - ii. NEMTEK NemLink (connected to Energizer): not required
    - iii. NEMTEK 8-way Relay Board: not required
    - iv. NEMTEK Smart IO card: 192.168.0.100
15. Click on "Save Config" to change the parameters on the module. "ACK" will appear three times in the lower left dialog box if the changes were successful.

## Programming IP Addresses

16. To check that the settings were saved successfully, click on the "Search Device" button again. The changed network device IP address should appear in the dialog box above the "Search Device" button. Click on this device and ensure that all parameters were changed correctly.
17. Remove the jumper as mentioned in step 2 for the NemLink boards. Install the jumper on the 2 lower pins for the 8-way Relay board.
18. The network device is now ready for installation.

# Configuration of the components

## THE SMART IO BOARD



To configure the Smart IO Board, follow these steps:

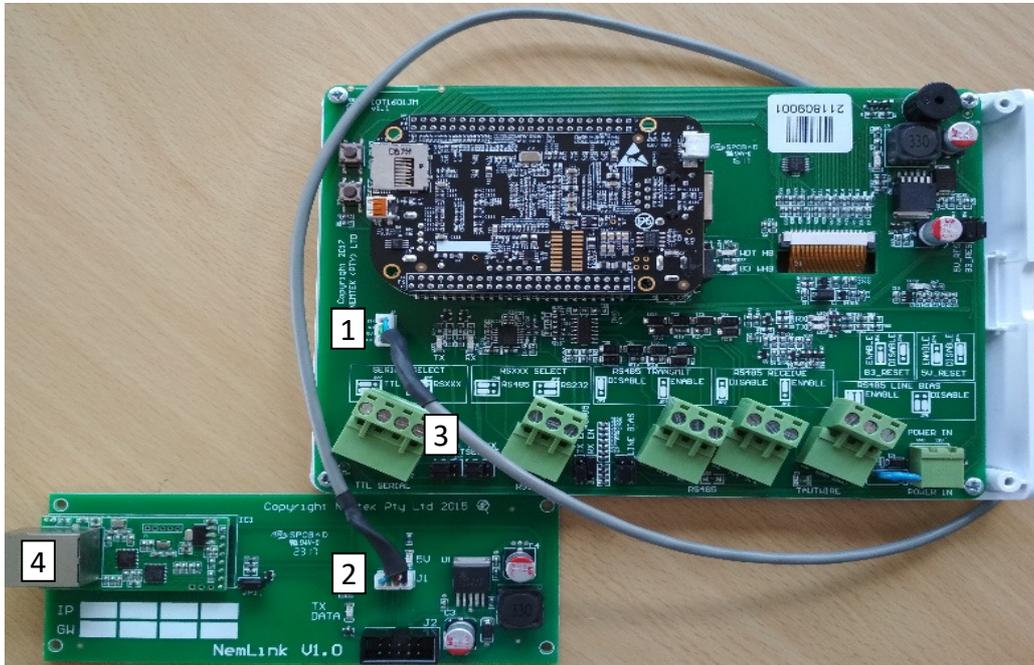
1. Disconnect the power connector. [1]
2. Configure the address of the board to match the address of the corresponding energizer or 8-way Relay Board that needs to be controlled, by chronologically using jumpers JP7. When all jumpers are populated, the address is 1. When a jumper is removed, the corresponding number will be added to the network address. For example, if jumpers 1, 4 and 8 are removed, the address will be  $1 + 1 + 4 + 8 = 14$ . [2]
3. Populate jumper JP7 A to put the board in programming mode. [3]
4. Jumper JP7 C is only used when the board is connected to a Druid energizer. When the jumper is populated, the Smart IO board will force the state of its inputs onto the energizer and no changes will be possible on the energizer itself. When the jumper is not populated changes are possible on the energizer and the Smart IO board will only change the energizer state, once a change on the Smart IO board inputs happen. [3]
5. Jumpers JP7 B and D can either be populated, or not. [3]
6. Connect the Smart IO board to a computer, using an ethernet cable. [4]

## Configuration of the components

7. Download and save the NEMTEK SIO8Cfg setup software from: <http://nemtek-druid-fenceprobe.com/downloads/NemtekSmartIOCardConfigurationSoftware.exe>
8. Power up the board (The NEMTEK Power Pack can be used to power the board).
9. Open the NEMTEK SIO8Cfg.exe application on the computer
10. Select the device (Druid 2x, TW Node or 8-way Relay Board) to which the Smart IO board will be connected to by clicking on one of the three top tabs.
11. Enter the same IP address (Static IP) of the Smart IO board that was configured in step one, in the IP address field, in the top right corner.
12. Ensure 20108 is entered in the Port field, in the top right corner.
13. If the Smart IO board will be connected to an energizer, map the energizer status and alarms to the Smart IO relay outputs, by ticking appropriate boxes. The Smart IO Board Inputs are preconfigured to activate certain functions on the energizer and can't be changed. Input 1 is zone 1 On/Off, input 2 is zone 2 On/Off, input 3 is zone 1 Hi/Low voltage and input 4 is zone 2 Hi/Low voltage.
14. If the Smart IO board will be connected to an 8-way Relay Board, map the 8-way Relay Board inputs to the Smart IO relay outputs, by ticking the appropriate boxes. The Smart IO board inputs are configured one-to-one to the 8-way Relay Board's outputs and can't be changed. So input 1 of the Smart IO board controls relay 1 of the 8-way Relay Board and input 2 controls relay 2 of the 8-way Relay Board etc.
15. Click Send in the lower left corner. The VALID COMMAND LED will momentarily flash on the Smart IO Board, indicating the board was programmed. [5]
16. Remove jumper JP7 A. [3]
17. Disconnect the board from the computer and connect to the energizer, relay card or ethernet switch with an ethernet cable.

# Configuration of the components

## THE FG7



To configure the Smart IO Board, follow these steps:

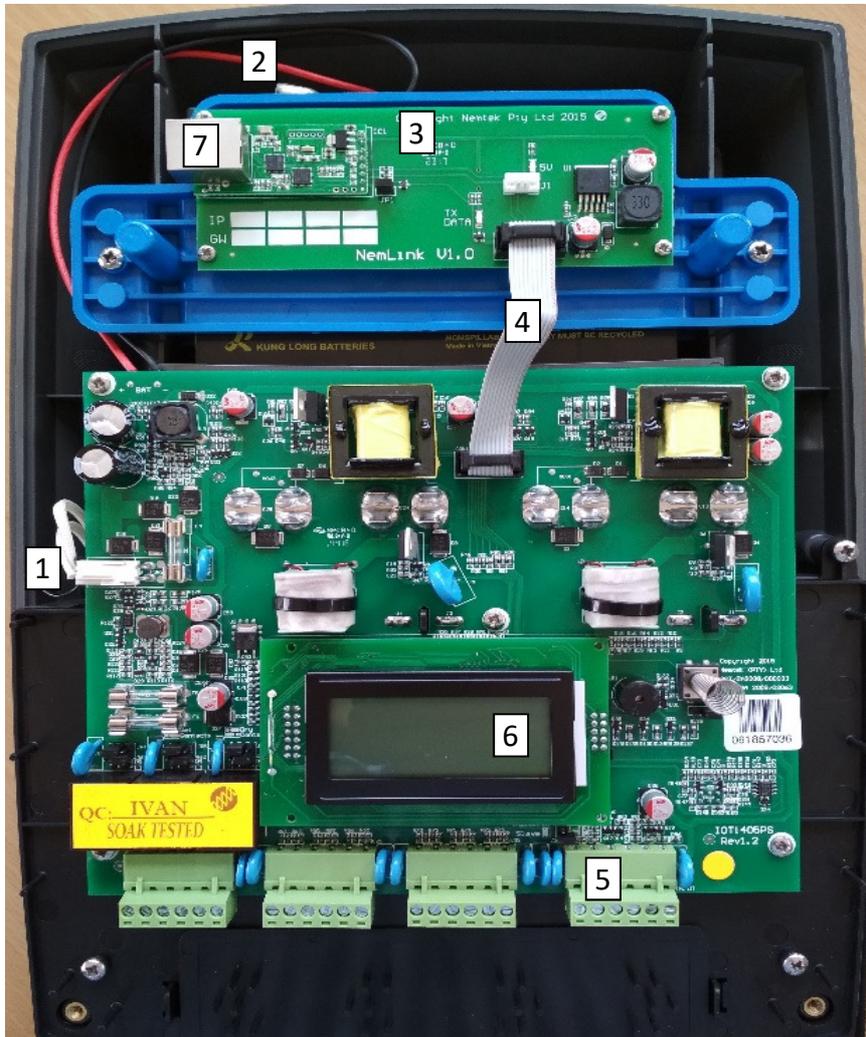
1. Disconnect the power and open the NEMTEK FG7 (Refer to the FG7 Installer Manual).
2. Connect the supplied FG7-Nemlink pigtail to the FG7 J7 connector. [1]
3. Connect the other end of the pigtail to the Nemlink J1 connector. [2]
4. Configure the SERIAL SELECT jumper JP7 to TTL. No other jumpers need to be changed. Refer to the Installer Manual for a complete list of jumper configurations. [3]



5. Close the FG7.
6. Connect the FG7 to a port on the ethernet switch (the port number does not matter) with an ethernet cable. [4]
7. Power up the FG7.
8. Configure the FG7 software by referring to the FG7 Installer Manual. The FG7 can't connect with any 8-way Relay Boards in this network configuration. **To avoid a network malfunction, set the FG7 for 0 IO Boards and remove all relay mapping.**

## Configuration of the components

### THE DRUID LCD 2x ENERGIZER



To configure the Druid LCD 2x Energizer, follow these steps:

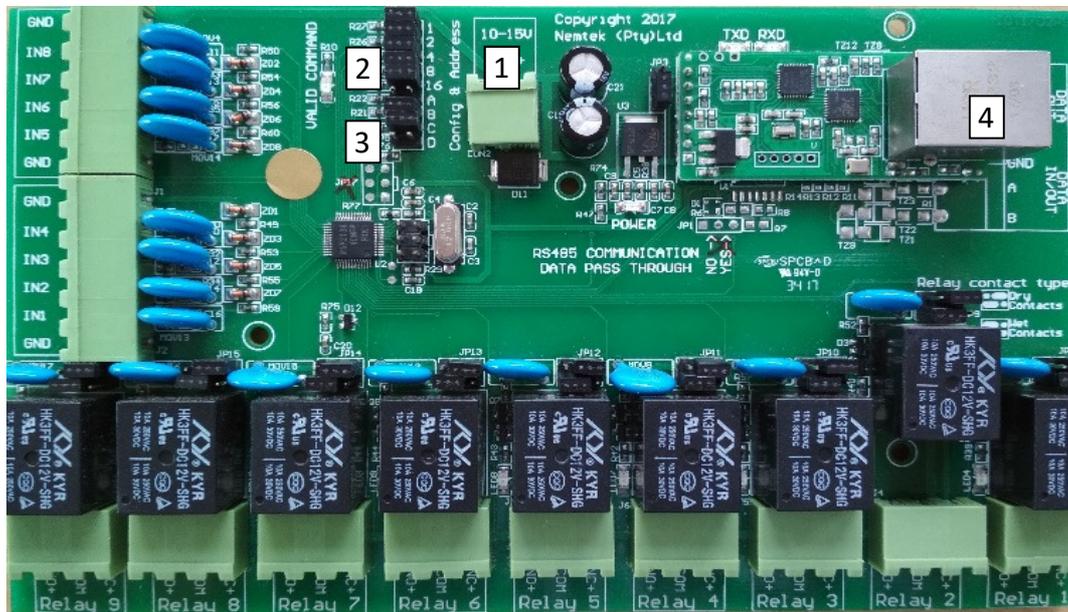
1. Disconnect the energizer mains and battery power. [1, 2]
2. Install the Nemlink board on top of the battery brace and fasten with 4 screws. [3]
3. Install the 10-way ribbon cable between the energizer and Nemlink board. [4]
4. Connect a keypad to the energizer. [5]
5. Ensure the energizer is restored to factory default:
  - a. Reconnect the battery power. [2]
  - b. Reconnect the mains power. [1]
  - c. Within 60 seconds of reconnecting the power, enter 2389# on the keypad.

## Configuration of the components

6. Ensure the energizer is restored to factory default:
  - a. Reconnect the battery power. [2]
  - b. Reconnect the mains power. [1]
  - c. Within 60 seconds of reconnecting the power, enter 2389# on the keypad.
7. Enter installer mode by entering 012345\*0# on the keypad. Ensure the energizer LCD display turns purple. [6]
8. Configure the network address by entering 51xx\*#, where xx is the address from 1 to 32. Energizer addresses must be chronologically configured starting at 1. For example, three energizers on a network with addresses 5, 18 and 22 is not allowed, as they need to be addressed 1, 2 and 3. Relay boards and energizers are addressed separately from 1 to 32. This address needs to match the address of the 8-way Smart IO Board assigned to the energizer.
9. Exit installer mode by entering \*#. Ensure the energizer LCD display turns blue. [6]
10. Ensure the energizer network address is displayed on the LCD. [6]
11. Connect the energizer to a port on the ethernet switch (the port number does not matter) with an ethernet cable. [7]
12. Route the ethernet cable out the bottom of the energizer enclosure and install the lid.

# Configuration of the components

## THE ETHERNET 8-WAY RELAY BOARD



1. Disconnect the power connector. [1]
2. Configure the address of the relay board by chronologically using jumpers JP7 1 to 16. When all jumpers are populated, the address is 1. When a jumper is removed, the corresponding number will be added to the network address. For example, if jumpers 1, 4 and 8 are removed, the address will be  $1 + 1 + 4 + 8 = 14$ . The first relay board in the network MUST be configured as address 1, the second as address 2 etc. Addressing, for example, 3 boards in the network with addresses 3, 6 and 20 is not allowed, as their addresses must be 1, 2 and 3. This address also needs to match the address of the 8-way Smart IO Board assigned to the energizer. Relay boards and energizers are addressed separately from 1 to 32. On the FG7 module, an address offset of 32 is added to all relay boards. Therefore, relay board 1 will be referred to as 33 ( $1+32$ ), relay board 2 as 34 ( $2+32$ ) etc. on the FG7. [2]
3. Ensure jumpers JP5 B and C are populated. Jumpers JP5 A and D can either be populated or not. [3]
4. Connect the relay board to a port on the ethernet switch (the port number does not matter) with an ethernet cable. [4]
5. Power up the relay board (The NEMTEK Power Pack can be used to power the relay board).