

# **EsofNET System Design and Wiring Instructions for Installers**

This concise reference on EsofNET system design and installation guideline is written for those who are already familiar with EsofNET systems. They should have read through the following Technical and User manuals, and have attended relevant courses on ELID Card Access Controllers and EsofNET software.

EL2200 User Manual  
EL2200 Technical Manual  
EL1200 Manual  
EsofNET User Manual  
EL80RPU/ESS550DGP Manual

## **System Configuration**

EsofNET typical system configuration is shown in the attached drawing. The properties of each building block is briefly discussed below.

### **EL22xx & EL12xx Reader Controllers**

These controllers are the basic building blocks for access control. Each controller is capable of controlling up to 2 readers for one door. The controllers are able to operate completely on its own. Certain settings have to be done at the controller. Other commands may be remotely controlled. Please refer to EL2200 Technical Manual, EL2200 User Manual, EL1200 Manual for operation of these equipment.

### **EL80 Reader Processing Unit (RPU)**

Card readers that can be used with EL80 RPU are EL12xx and EL22xx. Each reader controller is used to control ONE door, and up to 16 controllers can be wired together in a bus. This bus consists of 2 pairs of twisted cables, and can be extended up to 1 km. The cable should be at least 22 AWG. Shielding is preferable though not essential. The signal on this bus is proprietary to ELID (ELID Multi-drop bus). Note that the method of wiring for the bus is identical to that used in RS485.

Reader Processing Unit (EL80) takes the place of EL75 or EL72 used in ESOFwin systems. Each EL80 RPU can provide either 2 or 4 buses - catering for 32 or 64 doors. Since EL80 communicates with the server via RS232, it is necessary to place the EL80 near the server.

### **EFD 1608 Field Interface Panel**

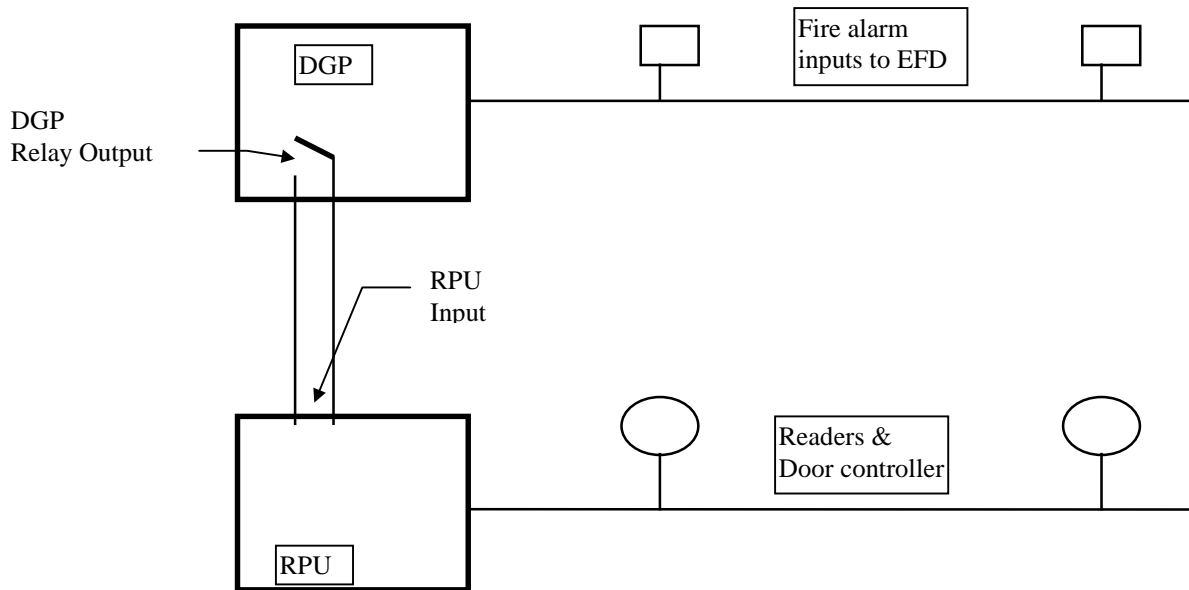
Each Field Interface Panel, EFD1608, has 16 supervised inputs and 8 relay outputs (other combinations are also available). A sensor can be wired to the panel by 2 wires. A termination resistor has to be used for supervising the integrity of the line. This resistor is wired in series with a normally closed contact, but in parallel with a normally open contact. Alarm is generated when there is an abnormal condition, either an open circuit (on a normally closed contact) or a short circuit (on a normally open contact). Alert (line tamper) is generated when such lines are detected to be short (for normally closed contact) or open (normally open contact).

### **ES550 Digital Gathering Panel (DGP)**

ES550 Data Gathering Panel is used for communicating with EFD1608 field panels. Up to 16 units of EFD1608 can be connected together to form a bus to communicate with ESS550 Data Gathering Panel (DGP). Maximum number of buses supported by each DGP is 4, meaning that up to 64 EFD1608 can be connected to a single DGP. The communication bus uses ELID Multi-drop signalling, and the wiring requirement is identical to that used for EL80 RPU. ES550 communicates with the server by RS232. Hence it must be located near the server.

## **Inter-Connection Between DGP's and RPU's**

Each DGP and RPU is equipped with 16 inputs and 8 outputs. These inputs and outputs are for signalling between various DGP's and RPU's. Take for example, a case where it is required to open certain exit doors when fire is detected. The fire alarm signals are wired to various EFD1608 inputs, which in turn are linked to a specific DGP. The door activation signals on the other hand come from reader controllers which are linked to an RPU. We now connect one of the relay output (fire alarm output) signal on the DGP to one of the sensor input (Fire alarm input) on the RPU. The DGP's can be programmed in such a way that the fire alarm output relay is activated when any fire alarm is sensed from the EFD1608. The RPU is programmed in such a way that when the fire sensor input is activated, it will issue a command to specific doors to open them permanently. Thus when a fire occurs, the signal travels to EFD, then to DGP, and then through the interconnection between DGP and RPU to RPU, and then RPU will issue a door open command to specific controllers, and these doors will open. Note that in this sequence of events, the server is not involved, only the EFD's, DGP, RPU and reader controllers, and so the reaction time is therefore significantly improved.



## Design

### Access Control Doors

Identify the various doors where card readers are to be installed. For each door, identify the following:-

- Type of Readers, Location of Readers
- Is keypad required?
- Is there an exit reader?
- Is there an exit push button?
- Location of magnetic door sensor.
- Type of electric lock to use, and location of lock.
- Power supply requirement - battery size.
- Location of control panel.
- Wiring route.

### **Reader Processing Unit**

Work out the number of RPU required. They should preferably be located in the control room near to the server computer. For each RPU, specify the following:-

- Draw the route of the Multi-drop buses originating from the RPU.
- Identify each reader controller along the bus, and write down the reader address.
- Make sure that maximum distance of the Multi-drop bus is less than 1 km.
- As far as possible, load the buses equally, and provide adequate spare addresses for future expansion, without having to pull new buses.

### **Field Devices EFD1608**

Identify all sensor inputs, and specify the following:

- Type of sensor - whether normally open or normally closed.
- Connection circuit between sensor and EFD.
- Location of the sensor and wiring route from sensor to EFD.
- Tag and address (which EFD and which point).
- What happens when the sensor is activated?
- What happens when the sensor returns to normal?

Identify all output points, and specify the following

- Type and function of the output device.
- Connection circuit between output device and EFD.
- Wiring route between EFD and output device.
- Tag and address (Which EFD and which point).
- What circumstances will activate the output?
- What circumstances will restore the output?

### **Data Gathering Panel**

Work out the number of RPU required. Locate them as near the server as possible. For each DGP, specify the following:-

- Draw the routes of the Multi-drop buses originating from the DGP.
- Identify each EFD1608 along the bus, and write down the address.
- Make sure that maximum distance of the Multi-drop bus is less than 1 km.
- As far as possible, load the buses equally, and provide adequate spares for future expansion.

### **Server, LAN and Workstation**

It is also necessary to design the Server, LAN and workstations connection and configuration.

- First specify the location of the server and various workstations that need to be linked together.
- Select a convenient place for the hub to be located.
- Sketch in the route of the LAN cables.
- Sketch in the route of the RS232 cabling between DGP & RPU and server. The distance should not exceed 100 m.

## **Preliminary Testing & Programming**

### **Readers**

Activate each reader in the standalone mode and test that it can operate fully. Note that EL1200 and EL2200 both can be programmed without connecting to PC. The controllers are also furnished with diagnostic program to help you to test external devices connected to the controller such as magnetic door sensor, push button, electric lock etc. Make sure that the charger is set to 13.8VDC (measured with battery disconnected), and ensure that the power supply back-up functions when mains is disconnected.

### **Graphics**

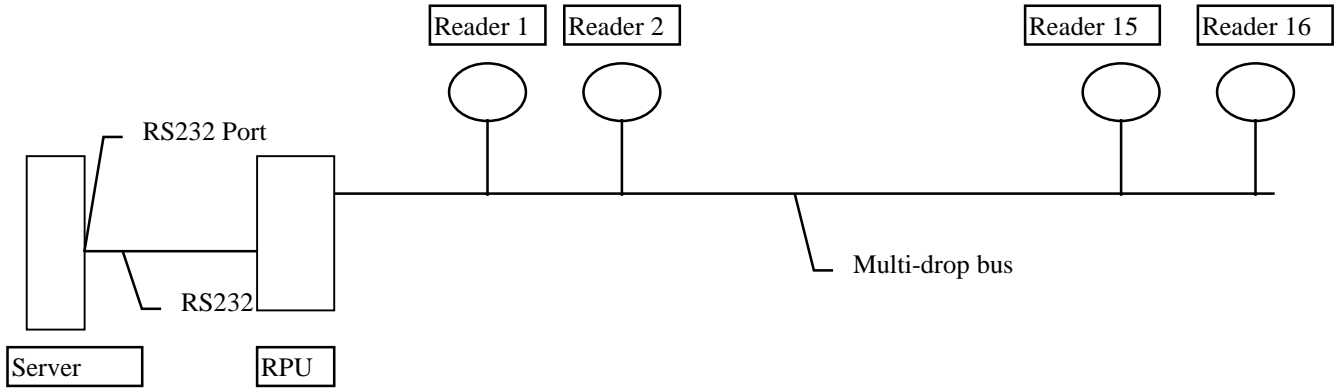
Identify what drawings are needed for the graphics display. The basic drawings can be taken from structural drawings (e.g. in AutoCad format).

- There should be a main display which will show the entire site.
- Identify specific points on the main display which will allow users to click to enter into secondary display.

The above information should be collected and entered into tables and drawings such as that shown in the appendix.

# ELID EsotNET System - Reader Design Worksheet

Project name \_\_\_\_\_ Sheet \_\_\_\_\_



Server Serial Port \_\_\_\_\_ Server Location \_\_\_\_\_

RS232 cCble Marking \_\_\_\_\_

RPU No. \_\_\_\_\_ Type \_\_\_\_\_ Location \_\_\_\_\_

Multi-drop Bus \_\_\_\_\_ ( Bus 1 = SK1, CN2; Bus 2 = SK1, CN3,  
Bus 3, = SK2, CN2, Bus 4 = SK2,CN3)

Multi-drop Cable :  
 Pin 1 (TX+ ) = \_\_\_\_\_ (default colour = orange)  
 Pin 2 (Tx- ) = \_\_\_\_\_ (default colour = blue )  
 Pin 3 (Rx +) = \_\_\_\_\_ (default colour = white)  
 Pin 4 (Rx-) = \_\_\_\_\_ (default colour = black)



**Remarks :**

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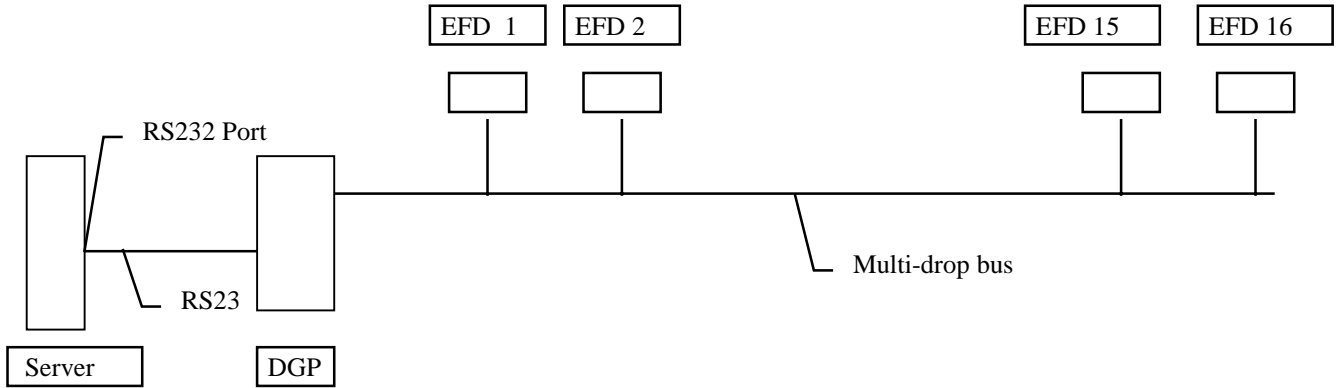
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**Prepared by** \_\_\_\_\_ **Date** \_\_\_\_\_

# ELID EsofNET System - EFD Design Worksheet

Project Name \_\_\_\_\_ Sheet \_\_\_\_\_



Server Serial Port \_\_\_\_\_ Server Location \_\_\_\_\_

RS232 Cable Marking \_\_\_\_\_

DGP No. \_\_\_\_\_ Type \_\_\_\_\_ Location \_\_\_\_\_

Multi-drop Bus \_\_\_\_\_ ( Bus 1 = SK1, CN2; Bus 2 = SK1, CN3,  
Bus 3, = SK2, CN2, Bus 4 = SK2,CN3)

Multi-drop Cable :  
 Pin 1 (TX+ ) = \_\_\_\_\_ (default colour = orange)  
 Pin 2 (Tx- ) = \_\_\_\_\_ (default colour = blue )  
 Pin 3 (Rx +) = \_\_\_\_\_ (default colour = white)  
 Pin 4 (Rx-) = \_\_\_\_\_ (default colour = black)



**Remarks :**

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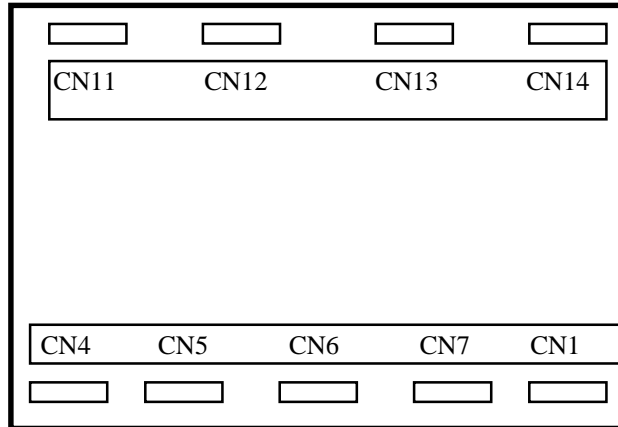
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**Prepared by** \_\_\_\_\_ **Date** \_\_\_\_\_

# ELID EsotNET I/O Points Design Sheet

Project Name \_\_\_\_\_ Sheet No. \_\_\_\_\_



EFD Address \_\_\_\_\_ Location \_\_\_\_\_

Multi-drop Bus Cabling :  
CN1/Pin 1 (TX+) = \_\_\_\_\_  
CN1/Pin 2 (TX -) = \_\_\_\_\_  
CN1/Pin 3 (Rx+) = \_\_\_\_\_  
CN1/Pin 4 (Rx -) = \_\_\_\_\_

### INPUT Points

| POINT NO.     | TAG | SENSOR TYPE | NO/NC | LOCATION | REMARKS |
|---------------|-----|-------------|-------|----------|---------|
| 1 (CN11/1-2)  |     |             |       |          |         |
| 2 (CN11/3-4)  |     |             |       |          |         |
| 3 (CN11/5-6)  |     |             |       |          |         |
| 4 (CN11/7-8)  |     |             |       |          |         |
| 5 (CN12/1-2)  |     |             |       |          |         |
| 6 (CN12/3-4)  |     |             |       |          |         |
| 7 (CN12/5-6)  |     |             |       |          |         |
| 8 (CN12/7-8)  |     |             |       |          |         |
| 9 (CN13/1-2)  |     |             |       |          |         |
| 10 (CN13/3-4) |     |             |       |          |         |
| 11 (CN13/5-6) |     |             |       |          |         |
| 12 (CN13/7-8) |     |             |       |          |         |
| 13 (CN14/1-2) |     |             |       |          |         |
| 14 (CN14/3-4) |     |             |       |          |         |
| 15 (CN14/5-6) |     |             |       |          |         |
| 16 (CN14/7-8) |     |             |       |          |         |

Notes: - Normally Open contact : Connect 3.3K in parallel with contact.  
Normally Closed contact : Connect 3.3K in series with contact.

### Output Points

| POINT NO.   | TAG | OUTPUT TYPE | FUNCTION | REMARKS |
|-------------|-----|-------------|----------|---------|
| 1 (CN4/1-3) |     |             |          |         |
| 2 (CN4/4-6) |     |             |          |         |
| 3 (CN5/1-3) |     |             |          |         |
| 4 (CN5/4-6) |     |             |          |         |
| 5 (CN6/1-3) |     |             |          |         |
| 6 (CN6/4-6) |     |             |          |         |
| 7 (CN7/1-3) |     |             |          |         |
| 8 (CN7/4-6) |     |             |          |         |

#### Notes:-

Type 1 output = Normally Open contact, connected between 1-2 or 4-5, Volt free output  
Type 2 output = Normally Closed contact, connected between 1-3 or 4-6, volt free output  
Type 3 output = Normally Open contact, 12VDC output  
Type 4 output = Normally Closed contact, 12VDC output

**Remarks**

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**Prepared by** \_\_\_\_\_ **Date** \_\_\_\_\_