



Multi *IFAX* System Networking Handbook

(For Networks with Maximum Integrity Network Controllers)

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DO NOT ATTEMPT TO INSTALL COMMISSION OR OPERATE AN *IFAXNetwork* BEFORE CAREFULLY READING ALL INFORMATION CONTAINED IN THIS HANDBOOK

The information contained in this document is subject to change without notification at the discretion of the Company

PRODUCTS DESCRIPTION

• **OVERVIEW**

IFAXNetwork allows independent *Multi/IFAX* Control Units to be drawn into a high integrity and 'seamless' peer-to-peer network.

This facility makes the *IFAXNetwork* ideal for larger building complexes and campus style environments.

Each *Multi/IFAX* retains fully autonomous operation, while the entire network functions as if the individual Control Units were extensively a single system.

Designed to satisfy the prime objective of maximum integrity for the safety of life, the distributed system form of the *IFAXNetwork* offers the advantage of a higher level of redundancy than can be available with a single central system.

Fully detailed Alarm, Fault and Disabled event information from any *Multi/IFAX* is reported to all others and system control can be undertaken from any location.

• **STANDARD FEATURES**

<p>◆ True peer-to-peer network that does not require a host or master controller.</p>	<p><i>Multi/IFAX</i> Control Units send and receive event information via the network to enable fully flexible distribution and co-ordination of system control.</p>
<p>◆ 32,256 Addressable Points, 1,536 Fire Zone capacity.</p>	<p>Expandable to 64,512 Points and 8,160 Fire Zones.</p>
<p>◆ High Integrity Communication.</p>	<ul style="list-style-type: none"> ➤ <i>IFAXNetwork</i> provides a very high level of system integrity that allows safety critical actions to be passed across the network from one <i>Multi/IFAX</i> Control Unit to another. ➤ Loss of one or more <i>IFAXNetwork</i> Stations does not affect the operation of the remainder of the network ➤ The communication protocol has been specifically designed to ensure that the receiving Station acknowledges each event message passed across the network in the fastest possible time. For larger networks this is essential for effective handling of the data passing between <i>Multi/IFAX</i> Control Units in an emergency condition. ➤ <i>IFAXNetwork</i> uses a token-passing non-collision communications protocol that treats all Stations equally ➤ To ensure the maximum integrity, all data received at every Station is automatically error-checked and corrected, then fully regenerated before onward transmission to the next Station. This ensures that any degradation of data due to line noise or attenuation is eliminated and allows use of standard 2-core fire resistant cable between Stations (i.e. MICC, or other suitable type to BS6387)

<p>◆ Maximum Network Fault-Tolerance.</p>	<ul style="list-style-type: none"> ➤ For the best possible robustness and reliability, <i>IFAXNetwork</i> Stations are interconnected with <u>two</u> counter-rotational and continuously monitored ring circuits, one of which operates as a secondary or 'stand-by' communication ring. ➤ With a single short-circuit or open-circuit fault between Stations, the link will be automatically isolated and full communication will be maintained throughout all Network Stations. ➤ With multiple interconnection failures, <i>IFAXNetwork</i> will automatically re-configure into two or more independent fully functional networks. <i>IFAXNetwork</i> will automatically re-configure as communications faults are cleared. ➤ Each <i>Multi/IFAX</i> Control Unit will indicate the location of any interconnection faults and any network division conditions.
<p>◆ Supports Alternative Cable Types.</p>	<ul style="list-style-type: none"> ➤ <i>IFAXNetwork</i> allows Stations to be interconnected with standard fire-resistant cable, or shielded twisted-pairs. These alternative media can be mixed in any manner required. ➤ The ability to accept standard fire resistant cable between network Stations allows safety critical events to be signalled across the network in accordance with BS5839: Part 1: 1988.
<p>◆ <i>IFAXNetwork</i> Information Exchange and Control.</p>	<ul style="list-style-type: none"> ➤ Each <i>Multi/IFAX</i> Control Unit always retains full stand-alone and autonomous operation, but additionally functions as part of a larger system. ➤ <i>IFAXNetwork</i> provides the following facilities. <ol style="list-style-type: none"> 1. Event Exchange <i>Multi/IFAX</i> units send and receive event (change of state) information across the network to allow distribution and co-ordination of system control. 2. Event Display All <i>Multi/IFAX</i> units provide fully detailed displays of all Alarm, Fault, Warning and Disabled events (to individual addressable point level) received from others. A typical Alarm event display message takes the form: <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <pre style="font-family: monospace; font-size: 1.2em;"> FIRE Smoke Station Name..... Zone Name Sensor Name..... Station 9 Zone 6 Loop 2 Sensor 34 </pre> </div> <p>The Station Name is the <i>IFAXNetwork</i> Stations textual description for the <i>Multi/IFAX</i> originating the event. The Zone Name and Sensor Name are the Stations Zone and Sensor textual location description for the device in Alarm condition. The 9, 6, 2, 34, and Smoke, are respectively the <i>IFAXNetwork</i> Station Number, <i>Multi/IFAX</i> Zone, Loop number, Point address, and type of the device in Alarm.</p>

	<p>3. Event Action</p> <p>In addition to their stand-alone / autonomous operation, the alarm outputs of each <i>Multi/IFAX</i> can be set to activate as required from any Zonal Alarm condition received from any other Control Unit on the <i>IFAXNetwork</i>.</p> <p>4. Control Operations</p> <p>From any <i>Multi/IFAX</i> location, interrogation and control operations can be completed of any one or all other Control Units on the <i>IFAXNetwork</i> as follows.</p> <ul style="list-style-type: none"> ➤ Disabling / Re-Enabling any individual Zone. ➤ Disabling / Re-Enabling any individual addressable sensor. ➤ Disabling / Re-Enabling any Loop circuit. ➤ Disabling / Re-Enabling <i>Multi/IFAX</i> Alarm Sounders. ➤ Disabling / Re-Enabling <i>Multi/IFAX</i> Auxiliary Relay outputs ➤ Disabling / Re-Enabling individual <i>Multi/IFAX</i> Alarm outputs. ➤ Network-wide 'Alarm Silence & Re-Sound' commands. ➤ Operation of network-wide 'System Reset' command. ➤ Full Analysis of Loop circuits. ➤ Full Analysis of any addressable sensor <p>Some, or all of the control facilities above may be limited to authorised operators by access code levels within the configuration data of individual <i>Multi/IFAX</i> Control Units.</p>
--	--

● **NETWORK ARRANGEMENTS**

▪ **General**

When a *Multi/IFAX* is connected to an *IFAXNetwork*, the Control Unit and its associated Network Interface Module are collectively described as a 'Station'.

IFAXNetwork uses 'Token Ring' communications protocols specially adapted for standard fire resistant cable or commercial grade shielded twisted-pairs.

For the best integrity, Stations are interconnected via two 2-wire fully monitored counter-rotational ring circuits, one of which operates as a secondary or 'stand-by' communication ring.

▪ **Fault Tolerance**

The token-passing non-collision communications protocol, automatic error-correction and regeneration of data at each network Station, and dual-ring circuit topology combine to ensure that *IFAXNetwork* affords both the highest communications integrity and maximum tolerance of both ring interconnection and Station equipment faults (as listed below).

The *IFAXNetwork* will automatically re-configure to restore the highest level of reliability and robustness as soon as communications faults are cleared.

- With a single Network Station interconnection (open-circuit or short-circuit) fault:
The *IFAXNetwork* communications will automatically re-configure to remain fully functional and intact between ALL *IFAXNetwork* Stations.
ALL *Multi/IFAX* Control Units will indicate the location (between Stations) of the interconnection fault.

- With a single Network Interface Module failure, or, an interconnection failure between a Network Interface Module and its associated *Multi/IFAX* Control Unit:
Communications will remain fully functional and intact between all other *IFAXNetwork* Stations.
ALL *Multi/IFAX* Control Units will indicate the nature and location of the fault.
- With more than one Network Station interconnection (open-circuit or short-circuit) fault, or, with more than one Network Interface Module failure:
The *IFAXNetwork* communications will automatically re-configure into two or more independent fully functional networks.
Communications will remain fully functional and intact between all physically connected *IFAXNetwork* Stations on each of the independent networks.
ALL *Multi/IFAX* Control Units (*on each of the independent networks*) will show that the overall network has sub-divided, together with the locations of the faults.

▪ ***IFAXNetwork* Interconnection Cabling**

IFAXNetwork supports interconnections completed with a range of alternative cable types.

Dependent on both the physical arrangements of equipment and operational control requirements for the network, these types can be mixed as required.

The cable types supported are:

- Standard 2-core MICC or other fire-resistant cables complying with BS6387.
- Shielded twisted-pair cables.

▪ **Cable Type Considerations:**

a) *Multi/IFAX* Control Unit Connection to the Network:

Each *Multi/IFAX* Control Unit is connected to the *IFAXNetwork* via an associated Network Interface Module.

Interconnection between the *Multi/IFAX* and its Network Interface Module is completed via a 7-wire link comprising, a full-duplex EIA-485 4-wire communication link operating at 4800 bps, 24V DC power and an open-collector remote alarm signal.

Generally, the Network Interface Module is fitted within its associated *Multi/IFAX* Control Unit.

Where this is the case, the interconnection can be completed with 7 individual lengths of standard 16/0.2 equipment wire (arranged as 2x twisted-pairs & 1x twisted 3-core).

b) *IFAXNetwork* Station-To-Station Interconnection:

For the best integrity, Stations are interconnected with two fully monitored counter-rotational ring circuits. One of these operates as a secondary or 'stand-by' communication ring.

This arrangement is highly tolerant of interconnection cable or equipment faults and ensures the maximum robustness and reliability for signalling links between *IFAXNetwork* Stations.

Each link is subject to a maximum distance limit of 1200 metres (dependent on cable specification).

Where necessary, this distance may be extended by the use of appropriate in-line signal booster units.

Signalling form is full-duplex EIA-422 at 4800 Baud.

Each communication link between adjacent *IFAXNetwork* Stations requires two cable-pairs. (One pair for the 'primary' and one pair for the 'secondary' communication ring circuit).

Ideally, the two communication cable-pairs that form the link should be separately routed between the Stations.

However, if the link can be adequately protected it is possible to complete this with a 4-core (2x twisted-pairs + screen) cable.

Where safety critical events are to be signalled across the *IFAXNetwork* and the communication links are required to provide prolonged operation in the event of a fire; they must be protected and installed to ensure adequate fire resistance, or otherwise be completed via two 2-core fire-resistant cables.

- **NETWORKED *Multi/IFAX* CONTROL UNIT OPERATIONS**

Operational procedures for each networked *Multi/IFAX* Control Unit are extensively the same as stand-alone panels.

Various commands entered via the keypad will automatically prompt the operator to confirm additional information to identify the individual *IFAXNetwork* Station that is to be affected by a command.

(The fully-context sensitive *Multi/IFAX* operational menu system guides users through this process to ensure that all operations are straightforward and clear).

Messages displayed at each *Multi/IFAX* Control Unit relating to Alarm, Fault and Disabled conditions throughout the network remain largely common with their non-networked counterparts.

Other than including additional information to defining the network location of the particular *Multi/IFAX* Control Unit reporting the event.

(Refer to *Multi/IFAX* Operating Instructions).

- ***Multi/IFAX* CONTROL OPERATIONS ACROSS THE *IFAXNetwork***

Though the *IFAXNetwork* functions as a single and fully integrated system that allows control to be undertaken from any *Multi/IFAX* Control Unit location, certain operations are not permitted across the network.

These specific functions can only be completed at the local *Multi/IFAX* Control Unit that is to be affected by the operation.

- 'Station Disconnection / Reconnection' - from the remainder of the *IFAXNetwork*.
- Manual Re-configuring of a *Multi/IFAX* system.
- 'Walk Test'.

The event record at every *Multi/IFAX* Control Unit will contain all events that have occurred at all Stations.

The events are stored in the order that they are received at each *Multi/IFAX* Control Unit via *IFAXNetwork*.

A continuous hard-copy record of *IFAXNetwork* events can be taken at any Station location, by connecting a printer to its local *Multi/IFAX* Control Unit.

On accessing *Multi/IFAX* *View* and *Disable* menus, the operator will automatically be prompted to enter the network Station number that is to be affected by the subsequent command.

To illustrate this, a typical example follows.

Example: Disabling a Zone

From accessing the *Disable Zone* menu (at *IFAXNetwork* Station 1), the LCD displays and operation sequence to disable a Zone at a remote *Multi/IFAX* Station would be similar to the following:

```
Disable Zone:
Station Number: 1
Station Name.....
(This Station)      [Enter/Cancel/1...9]
```

The number range shown in brackets indicates the valid Station number range for the *IFAXNetwork*.

Keypad entry: 9

```
Disable Zone:
Station Number: 9
Station Name.....
[Enter/Cancel/1...9]
```

Keypad entry: Enter

```
Disable Zone at Station 9
Zone Number: __
[Cancel/0...255]
```

The number range shown in brackets indicates the valid Zone number range for the *Multi/IFAX* Control Unit at Station 9.

Keypad entry: 4

```
Disable Zone at Station 9
Zone Number: 4
Zone Name.....
[Enter/Cancel/0...255]
```

Keypad entry: Enter

```
Processing over Network
```


On acceptance of the instruction, the message above will be displayed for 2 or 3 seconds whilst the command is executed over the *IFAXNetwork*.

After this, the display will briefly show the following message to confirm that the Zone disablement has been successfully completed at the remote *Multi/IFAX* Control Unit and then return to the upper level *Disable Zone* menu, to allow selection of further zones.

```
Accepted
```

The *Disabled* LED indicator of all *Multi/IFAX* Control Units will be lit and all Control Units will include full details of the first disablement on their LCD's.

```
Zone Disabled
Station Name.....
Zone Name.....
Station 9   Zone 4
```

If further disablements are completed all *Multi/IFAX* Control Units will continue to display the first event only - but will also indicate the total quantity of disablements (see example below).

Full details of all disablements may be examined from any *Multi/IFAX* location via the operating menu.

```
Zone Disabled
Station Name.....
Zone Name.....
Station 9   Zone 4
(1 of X Disablements)
```

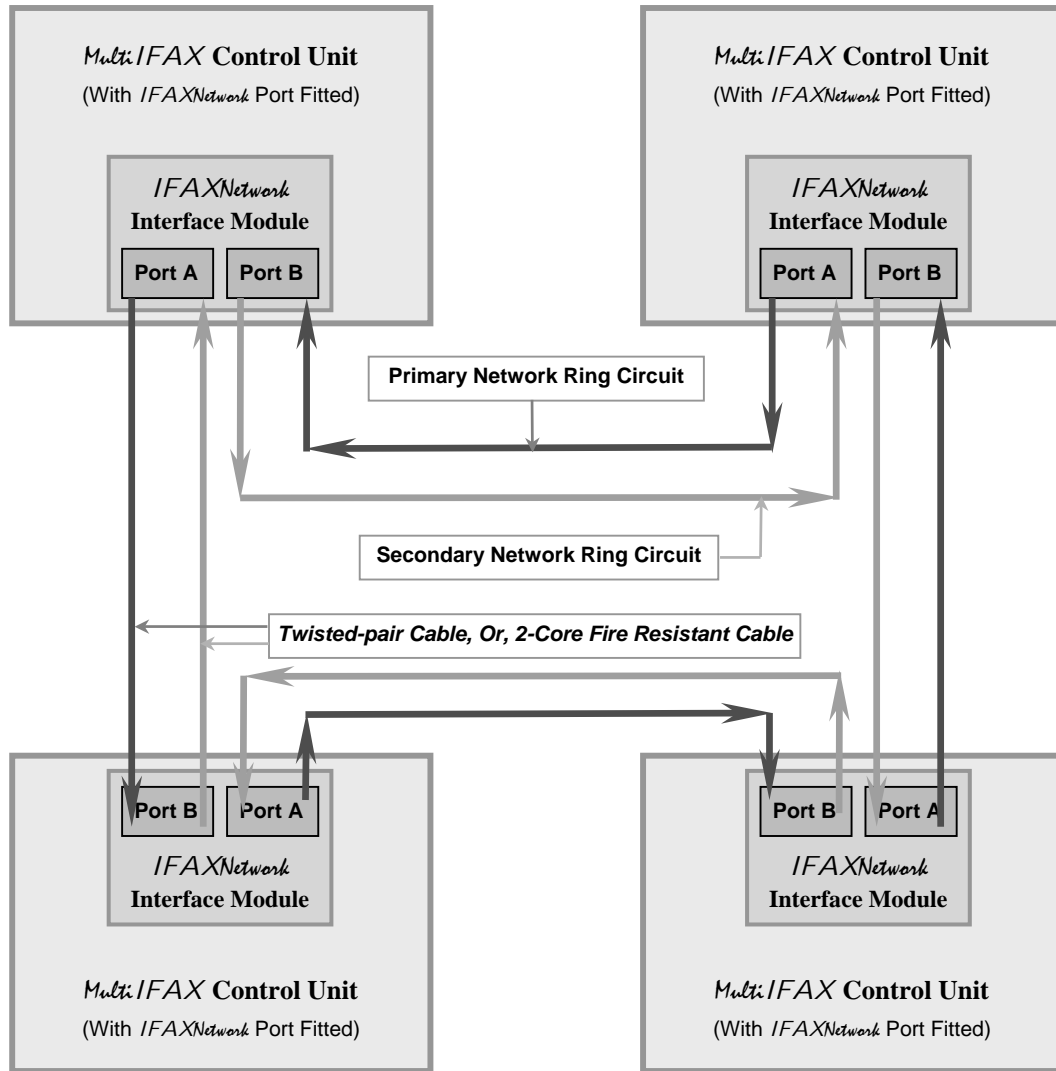
The **Station Name** is the *IFAXNetwork* Station textual description for the *Multi/IFAX* originating the event.

The **Zone Name** is the Stations Zone textual location description.

The **9**, and **4**, are respectively the *IFAXNetwork* Station Number and *Multi/IFAX* Zone number.

The **First of X Disablements** is only displayed where more than one disablement condition exists and indicates the total number.

- *IFAXNetwork* PRODUCTS INTERCONNECTION



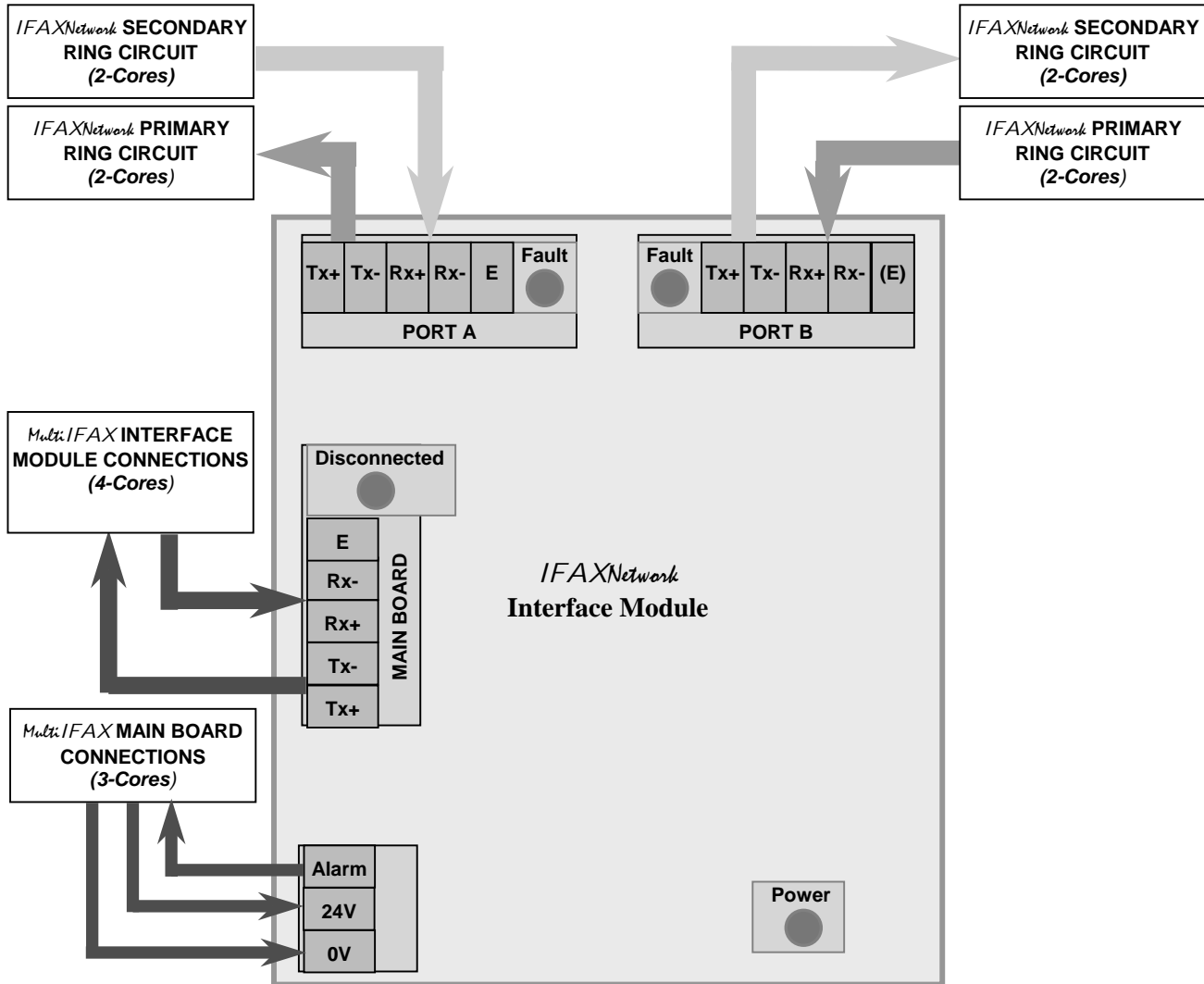
● **IFAXNetwork NETWORK INTERFACE MODULE SPECIFICATION**

Maximum Dimensions	100(w) x 165(h) x 18(d)
Module Interconnections to associated <i>Multi IFAX</i> Control Unit	7 Terminated via screw terminal blocks at each end 4 off - Full-Duplex EIA-485 Link [4800bps] 2 off - Nominal 24V DC Power Supply 1 off - Open-collector signal that operates if the <i>IFAXNetwork</i> Network Interface Module detects an incoming Alarm event (from a remote network station) and a communication failure exists with it's associated Control Unit.
Maximum Length of Interconnection to <i>Multi IFAX</i> Control Unit	1200 metres* * (Dependent on Cable Specification)
Nominal Operating Current	20mA @ 24V DC

<i>IFAXNetwork</i> Cable Interconnections	
2x 5-Way PCB Mounted Terminal Blocks	<u>PRIMARY RING CIRCUIT:</u> <u>PORT A:</u> 'Transmit +ve' & 'Transmit -ve' To Next <i>IFAXNetwork</i> Station. (2-Cores). EIA-422 @ 4800 Baud. Twisted-pair Cable, Or, 2-Core Fire Resistant Cable. <u>PORT B:</u> 'Receive +ve' & 'Receive -ve' From Previous <i>IFAXNetwork</i> Station. (2-Cores). EIA-422 @ 4800 Baud. Twisted-pair Cable, Or, 2-Core Fire Resistant Cable. <u>SECONDARY [STAND-BY] RING CIRCUIT:</u> <u>PORT A:</u> 'Receive +ve' & 'Receive -ve' From Previous <i>IFAXNetwork</i> Station. (2-Cores). EIA-422 @ 4800 Baud. Twisted-pair Cable, Or, 2-Core Fire Resistant Cable. <u>PORT B:</u> 'Transmit +ve' & 'Transmit -ve' To Next <i>IFAXNetwork</i> Station. (2-Cores). EIA-422 @ 4800 Baud. Twisted-pair Cable, Or, 2-Core Fire Resistant Cable.
Maximum Length of Interconnection between Network Interface Modules	1200 metres* * (Dependent on Cable Specification) <i>NOTE: Interconnection length may be extended by the use of appropriate in-line signal booster units</i>

On-Board Diagnostic LED Indicators	
Supply Healthy	Green LED Lit to indicate 5V DC power condition
Fault on Port A	Amber LED Lit to indicate a Primary or Secondary Network Ring Circuit Interconnection Failure effecting Port A
Fault on Port B	Amber LED Lit to indicate a Primary or Secondary Network Ring Circuit Interconnection Failure effecting Port B
Bypass	Amber LED Lit to indicate a Network Interface Unit Failure, Or that the Station has been 'Disconnected' from the rest of the network (via the associated <i>Multi IFAX</i> menu system)

- **IFAXNetwork NETWORK INTERFACE MODULE BLOCK DIAGRAM**



- **IFAXNetwork NETWORK INTERFACE MODULE CONNECTION DETAILS**

- **Multi/IFAX Control Unit - Connection to IFAXNetwork**

Each *Multi/IFAX* Control Unit is interfaced to the *IFAXNetwork* via an associated Network Interface Module that is generally fitted within the control unit enclosure.

However, where required the Network Interface Module may be located remotely subject only to a maximum interconnection distance of 1200 metres (dependent on cable specification).

Interconnection between a *Multi/IFAX* and its Network Interface Module is completed via a 7-wire link comprising; a full-duplex EIA-485 4-wire communication link operating at 4800 bps, current limited 24V DC power and single open-collector remote alarm signal connection.

Generally, the Network Interface Module is fitted within its associated *Multi/IFAX* Control Unit.

Where this is the case, the interconnection can be completed with 7 individual lengths of standard 16/0.2 equipment wire (arranged as 2x twisted-pairs & 1x twisted 3-core).

➤ **Connection Detail**

Interconnection between the *Multi/IFAX* Control Unit and Network Interface Module consists of wiring between terminals at either unit (as follows).

Interconnection information and terminal assignments are:

<i>Multi/IFAX</i> Interface Module Terminal (and Function)	<i>Multi/IFAX</i> Main Board Terminal (and Function)	<i>IFAXNetwork</i> Network Interface Module 5-Way Terminal Block Marked 'Main Board' (and Function)	<i>IFAXNetwork</i> Network Interface Module 3-Way Terminal Block (and Function)	'Paired' Wire Cores
No Connection	Rx + (Receive +)	Tx + (Transmit +)	No Connection	Pair 1
No Connection	Rx - (Receive -)	Tx - (Transmit -)	No Connection	Pair 1
No Connection	Tx + (Transmit +)	Rx + (Receive +)	No Connection	Pair 2
No Connection	Tx - (Transmit -)	Rx - (Receive -)	No Connection	Pair 2

- (Power 0V)	No Connection	No Connection	0V (Power Input -)
+ (Power +V)	No Connection	No Connection	24V (Power Input +)
Output A -ve	No Connection	No Connection	Alarm¹

¹ This is an open-collector signal that operates if the *IFAXNetwork* Network Interface Module detects an incoming Alarm event (from a remote network station) **and** a communication failure exists with it's associated *Multi/IFAX* Control Unit.
The signal is used to operate the Common Alarm LED and piezo sounder of the *Multi/IFAX*.

➤ *IFAXNetwork* **Station Address Setting**

A unique 'Station number' and a textual description of its location is set within the configuration data of each *Multi/IFAX* Control Unit on an *IFAXNetwork*.

Each *Multi/IFAX* Control Unit automatically downloads the Station number to its associated *IFAX* Network Interface Module during system configuration.

➤ *IFAXNetwork* **Station to Station Interconnection**

➤ **General**

For the highest possible integrity, *IFAXNetwork* Stations are interconnected with two 2-wire fully monitored counter-rotational ring circuits.

One of these operates as a secondary or 'stand-by' communication ring.

This arrangement is highly tolerant of both interconnection and equipment faults and ensures the maximum robustness and reliability of communication between all *Multi/IFAX* Control Units of an *IFAXNetwork*.

➤ **Connection Detail**

Normally, each interconnection link is subject to a maximum distance limit of 1200 metres (dependent on cable specification).

However, where necessary this limit may be extended by the use of appropriate in-line signal booster units.

Signalling form is full-duplex EIA-422 at 4800 Baud.

Each communication link between adjacent Network Stations requires two cable-pairs.

(One pair for the 'Primary' and one pair for the 'Secondary' communication circuit).

Ideally, the two communication cable-pairs that form the link should be separately routed between the *IFAXNetwork* Stations.

However, if the link can be adequately protected it is possible to complete this with a 4-core (2x twisted-pairs + screen) cable.

(I.e. 1x 4-core from the preceding *IFAXNetwork* Station, and 1x 4-core onwards to the next *IFAXNetwork* Station).

Where safety critical events are to be signaled across the *IFAXNetwork*, and to provide prolonged operation in the event of a fire, the communication links must be protected and installed to ensure adequate fire resistance.

In this case, the links can be completed via two 2-core fire-resistant cables.

At each end of the network link, terminations are completed via 5-way screw terminal blocks.

Interconnection information and terminal assignments are:

<i>IFAXNetwork</i> Link – END 1 Network Interface Module PORT A Terminal	<i>IFAXNetwork</i> Link – END 2 Network Interface Unit PORT B Terminal	'Paired' Wire Cores
Tx + (<i>Transmit A +ve</i>)	Rx + (<i>Receive B +ve</i>)	Pair 1
Tx - (<i>Transmit A -ve</i>)	Rx - (<i>Receive B -ve</i>)	Pair 1
Rx + (<i>Receive A +ve</i>)	Tx + (<i>Transmit B +ve</i>)	Pair 2
Rx - (<i>Receive A -ve</i>)	Tx - (<i>Transmit B -ve</i>)	Pair 2
E (<i>Signal Ground</i>)	(E) (<i>Signal Ground</i>)	Screen/Core

• *IFAXNetwork* **OPERATION**

➤ **Glossary**

IFAXNetwork: A group of *MultiIFAX* Control Units, together with their associated Network Interface Modules and cabling.

IFAXNetwork **Interface Unit**: The means of connecting a *MultiIFAX* Control Unit to the network cabling.

Panel: An *IFAXRepeater* Repeater/Control Panel, or the main *MultiIFAX* Control Unit at an *IFAXNetwork* Station.

Station: The combination of a *MultiIFAX* Control Unit (together with its Repeater / Control Panels), addressable sensors and localised Alarm Circuits and *IFAXNetwork* Interface Module.

➤ **Multi/IFAX Displays – General**

The *Multi/IFAX* keeps an internal record of which was the first condition of a particular type (e.g. Alarm) and which was the most recent.

These are indicated on the LCD by the words: *First* and *Newest*.

The ordering of any other conditions of that type is not indicated on the display (although this can be clearly identified from the event log and on printed records).

The Status Display normally shows the *First* condition and the menu system is used to view the other conditions.

When the *First* condition has been cleared, the *Multi/IFAX* does not know which condition is the *next* earliest condition of that type.

Thus, it no longer uses the word *First* and only indicates which is the *Newest*.

➤ **Alarm Conditions on the IFAXNetwork**

All network Stations will display full details of the first Alarm condition to occur on the *IFAXNetwork*, including the originating Zone, Sensor and network Station.

Additionally, the common Fire LED indicator of all *Multi/IFAX* Control Units will be lit.

The Sounders Activated and Remote Signal Activated LED's may also be lit if appropriate.

If more than one Alarm exists, all Stations will continue to display the first event only - but will also indicate the total quantity of Alarm conditions.

Full details of all Alarm conditions may be examined from any *Multi/IFAX* location via the operating menu and viewed in the display order 'Latest Alarm' – 'First Alarm' – 'Others'.

An example Alarm message that will be displayed at all *Multi/IFAX* Control Units of an *IFAXNetwork* is shown below.

```

FIRE                               Smoke
Station Name.....
Zone Name Sensor Name.....
Station 9   Zone 6   Loop 2   Sensor 34
(First of X Alarms)
    
```

The **Station Name** is the *IFAXNetwork* Station textual description for the *Multi/IFAX* originating the event.

The **Zone Name** and **Sensor Name** are the Stations Zone and Sensor textual location description for the device in Alarm condition.

The **9**, **6**, **2**, **34**, and **Smoke**, are respectively the *IFAXNetwork* Station Number, *Multi/IFAX* Zone, Loop number, Point address, and type of the device in Alarm condition.

The **First of X Alarms** is only displayed where more than one Alarm condition exists and indicates the total number.

All *Multi/IFAX* Control Units show the originating *IFAXNetwork* Station number and Station Name in their status messages, even the Station originating the message.

No Zonal LED's are activated for Alarm messages from remote *IFAX* Stations.

Each *Multi/IFAX* Control Unit's configuration data holds its own individual set of Alarm outputs operating patterns for each Zone of every Station on the *IFAXNetwork*.

Every individual Station can thus be set to activate its own localised Alarm output circuits as required dependent on the Alarm Zone of the originating Station.

➤ **Warning, Fault, Test and Disabled Conditions on the IFAXNetwork**

When no Alarm conditions exist, then any *Multi/IFAX* in a Warning, Fault, Test, or Disabled State have their full status messages broadcast and the first event of each type displayed at all network Stations in a similar manner.

Additionally, the common Warning, Disabled, Fault, Test, Supply Fault, Remote Signal Fault/Disabled and Sounders Fault/Disabled LED indicators will be operated as appropriate at all *Multi/IFAX* Control Units.

If more than one condition exists, all Stations will continue to display the first event only of each type - but will also indicate the total quantity of each condition.

Full details of all conditions of each type may be examined from any *Multi/IFAX* location via the operating menu

An example Warning message that will be displayed at all *Multi/IFAX* Control Units of an *IFAXNetwork* is shown below.

```
Pre-Alarm                                     Smoke
Station Name.....
Zone Name Sensor Name.....
Station 9   Zone 6   Loop 2   Sensor 34
                (First of X Warnings)
```

The **Station Name** is the *IFAXNetwork* Station textual description for the *Multi/IFAX* originating the event.

The **Zone Name** and **Sensor Name** are the Stations Zone and Sensor textual location description for the device in Pre-Alarm condition.

The **9**, **6**, **2**, **34**, and **Smoke**, are respectively the *IFAXNetwork* Station Number, *Multi/IFAX* Zone, Loop number, Point address, and type of the device in Pre-Alarm condition.

The **First of X Warnings** is only displayed where more than one Warning condition exists and indicates the total number.

➤ **Operation with IFAXNetwork Fault Conditions**

➤ **With a Communication Fault between Multi/IFAX Control Unit and its IFAXNetwork Network Interface Module**

If communication fails between a *Multi/IFAX* Control Unit and its associated Network Interface Module, the following type of message will be generated and stored in the event logs of all *IFAXNetwork* Stations.

Communications will remain fully functional and intact between all other *IFAXNetwork* Stations.

All *Multi/IFAX* Control Units will indicate the nature and location of the fault.

```
Network Failure between Station 9
Station Name.....
and Network Interface Unit
```

The **9** and **Station Name** are the *IFAXNetwork* Station number and textual description for the *Multi/IFAX* originating the event.

When correct communication is re-established, the fault message will be removed automatically and the following type of message will be stored in the event records of all Network Stations.

```
Network Healthy at Station 9
Station Name.....
10 Sep 2000 12:02:55 (16)
```


➤ **IFAXNetwork Operation with Communication Faults between Stations**

➤ **With a single IFAXNetwork Station-to-Station Communication Fault**

With a single Network Station-to-Station communication fault, (e.g. interconnection cable open-circuit or short-circuit, Network Interface Module failure, power failure, etc), the following type of message will be generated and stored in the event logs of all IFAXNetwork Stations.

The IFAXNetwork communications will automatically re-configure to remain fully functional and intact between **All** Stations.

All *MultiIFAX* Control Units will indicate the nature and location (between Stations) of the fault.

```
Network Failure between Station 9
Station Name.....
and Station 10
Station Name.....
```

The IFAXNetwork will automatically re-configure to restore the highest level of reliability and robustness as soon as the communication fault is cleared and the following type of message will be stored in the event records of all Network Stations.

```
Network Healthy between Station 9
Station Name.....
And Station 10
Station Name.....
11 Sep 2000 12:12:55
```

➤ **With multiple IFAXNetwork Station-to-Station Communication Faults**

If more than one Network Station-to-Station interconnection (open-circuit or short-circuit) fault occurs, the IFAXNetwork communications will automatically re-configure into two or more independent fully functional networks.

Communications will remain fully functional and intact between all physically connected IFAXNetwork Stations on each of the independent networks.

On each network, any status messages and Alarm output circuits that are activated by Zones from Stations that are now on other networks would be removed.

Two failure messages will be held at each Station showing the domain of the faults between Network Stations (as examples above).

Additionally, multiple copies of the following type of message will be stored to indicate the original IFAXNetwork Stations that are now dis-associated from each autonomous network.

```
Network Failure - Station 9 Missing
Station Name.....
```

The IFAXNetwork will automatically re-configure to restore the highest level of reliability and robustness as soon as the communication faults are cleared and the following types of message will be stored in the event records of all Network Stations.

```
Network Healthy at Station 9
Station Name.....
12 Sep 2000 12:15:55
```

• **‘DISCONNECTION’ OF A STATION FROM THE IFAXNetwork**

Station 'Disconnection' provides a means whereby an individual Multi-IFAX Station can be isolated from the IFAXNetwork to enable major engineering work to be completed.

➤ **Manual ‘Disconnection’ from the IFAXNetwork**

An individual Multi-IFAX Station may be manually 'disconnected' from its IFAXNetwork via the Setup menu.

➤ **IFAXNetwork Operation as Station ‘Disconnection’ occurs**

The disconnecting Station will broadcast the 'disconnection' event to all other Stations on the network. The IFAXNetwork Interface Module at the disconnecting Station will enter into the 'bypass mode', and activate its 'Disconnected' LED indicator.

The neighbouring IFAXNetwork Interface Modules will activate their fault LED's until the bypass configuration is completed (less than 60 seconds).

At the disconnecting Station: All status reports, fault activation's, Alarm activation's, and LED indications, that are operating in response to signals from any other IFAXNetwork Station(s) will be removed.

At all other IFAXNetwork Stations: All status reports, fault activation's, Alarm activation's, and LED indications that have originated from the disconnecting Station will be removed.

➤ **Operation during the ‘Disconnection’ period of an IFAXNetwork Station**

While a Multi-IFAX Station is disconnected all IFAXNetwork Stations will include the following type of message on their LCD's.

```
Station 9 Disconnected from Network
Station Name.....
```

All Multi-IFAX Control Units will operate their internal sounder warning sequences (0.5s- 'on', 9.5s- 'off').

The disconnected Station: Will ignore all status reports and events from all other *IFAXNetwork* Stations.
 Will not broadcast any events on the *IFAXNetwork*.
 Network Interface Module will have its 'Disconnected' LED activated and both 'Fault' LED's off.
Multi IFAX Control Unit and associated Network Interface Module can be powered-down.

All other *IFAXNetwork* Stations: Will ignore all status reports and events from the *IFAXNetwork* Station that is disconnected.

➤ **Manual 'Re-connection' to the *IFAXNetwork***

Any individual *Multi IFAX* Station may be manually 're-connected' to its *IFAXNetwork* via the *Setup* menu.

➤ ***IFAXNetwork* Operation as Station 'Re-connection' occurs**

The *IFAXNetwork* Interface Module at the re-connecting Station will exit the 'bypass mode' and de-activate its 'Disconnected' LED indicator.

Both fault LED's at the *IFAXNetwork* Interface Module of the re-connecting Station, and one fault LED at each of the two adjacent Interface Modules will be activated until the re-connection to the network is completed (less than 60 seconds).

At the re-connecting Station: All status reports, fault activation's, Alarm activation's, and LED indications, that are set to operate in response to signals from any other *IFAXNetwork* Station(s) will be re-applied.

At all other *IFAXNetwork* Stations: The 'Station Disconnected' display message will be removed, all status reports, fault activation's, Alarm activation's, and LED indications that originate from the re-connecting Station will be re-applied.

➤ **Automatic Station 'Disconnection' and 'Re-connection' to the *IFAXNetwork***

An individual Station will be automatically 'disconnected' from the *IFAXNetwork* when downloading configuration data to it's *Multi IFAX* Control Unit.

Following download, the Station will be automatically 're-connected' to the *IFAXNetwork*.

At the commencement and subsequent completion of downloading, the following types of corresponding message will be stored in the event records of all Network Stations.

Station 9 Disconnected from Network
Station Name.....
From External Computer
Station Name.....
11 Sep 2000 15:12:55

Station 9 Re-connected to Network
Station Name.....
From External Computer
Station Name.....
11 Sep 2000 15:16:55

• **TYPICAL IFAXNetwork RESPONSE TIMES**

This summary lists typical approximate response times to various cross-network operations based on an IFAXNetwork of 10 Multi/IFAX Control Units.

Remote Interrogation Operations	
To view a Loop Circuit summary from a remote <i>Multi/IFAX</i> on LCD	3 - 6 seconds
To increment to the next Loop Circuit summary display	5 - 8 seconds
To print a Loop Circuit summary from a remote <i>Multi/IFAX</i> Control Unit	10 - 17 seconds
To print a full Loop Circuit report from a remote <i>Multi/IFAX</i> Control Unit	25 - 35 seconds per device
To view an individual device report from a remote <i>Multi/IFAX</i> on LCD	3 - 6 seconds
To increment to the next addressable device report display	5 - 8 seconds
Remote Disable / Re-enable Operations	
Times stated is that to complete the operation at the remote <i>Multi/IFAX</i> and to display the resulting status information at all IFAXNetwork Stations	
To disable a Zone at a remote <i>Multi/IFAX</i> Control Unit	7 - 20 seconds
To re-enable a Zone at a remote <i>Multi/IFAX</i> Control Unit	10 - 30 seconds
To disable a Loop Circuit, or an individual addressable device at a remote <i>Multi/IFAX</i> Control Unit	3 - 6 seconds
To re-enable a Loop Circuit, or an individual addressable device at a remote <i>Multi/IFAX</i> Control Unit	10 - 17 seconds
To disable Alarm Sounders, Auxiliary Outputs, Remote Signal Output or an individual Alarm Output at a remote <i>Multi/IFAX</i> Control Unit	- 6 seconds 3
To re-enable Alarm Sounders, Auxiliary Outputs, Remote Signal Output or an individual Alarm Output at a remote <i>Multi/IFAX</i> Control Unit	10 - 17 seconds
Events Broadcast Across the IFAXNetwork	
Times stated is that for the operation to be completed and displayed (where appropriate) at all IFAXNetwork Stations	
Any single <i>Multi/IFAX</i> Fault report	3 - 6 seconds
Return to quiescent state on clearance of a <i>Multi/IFAX</i> Fault condition	4 - 10 seconds
An <i>IFAXNetwork</i> Fault report	3 - 13 seconds
Return to quiescent state on clearance of an <i>IFAXNetwork</i> Fault condition	7 - 20 seconds
Any single <i>Multi/IFAX</i> Fire Alarm condition	3 - 6 seconds
Action an Alarm Silence operation across the <i>IFAXNetwork</i>	3 - 13 seconds
Action an Alarm Re-Sound operation across the <i>IFAXNetwork</i>	3 - 6 seconds
Action a System Reset operation across the <i>IFAXNetwork</i>	15 - 23 seconds