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## - FIP / WorldFIP -

- Build
- Installation
- Tests
- Recommendations guide

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## 1. INTRODUCTION

### 1.1. PURPOSE OF THIS DOCUMENT

Ce This document will help engineers and technicians to design, build and install FIP/WorldFIP network.

ID	Title	Reference
/	/	/

### 1.2. REFERENCE DOCUMENTS

ID	Title	Reference
/	WorldFIP : design an installation	ALS50414 e-en

## 2. DISTANCE WIRE CABLE

Bus topology	31.25 kbits	1 Mbits	2.5 Mbits	5 Mbits
Maximum segment length	5 km	1 km	500 m	400 m
Maximum total network length	160 km with 31 repeaters	8 km with 7 repeaters	4 km with 7 repeaters	400 m

## 3. NUMBER OF SUBSCRIBERS

Bus topology	31.25 kbits	1 Mbits	2.5 Mbits	5 Mbits
Maximum number of subscribers per segment	64	32	32	32
Maximum number of subscribers per network	256	256	256	32

## 4. WIRE CABLE

There are 2 kinds of wire use for FIP WorldFIP installation; trunk cable and drop cable.

### 4.1. TRUNK CABLE 1 PAIR

Electrical characteristics of main cable derive from the standard IBM 1A. Use wire FIP cable 150 Ohms or 120 Ohms (the last one mainly use in railways).

*For small installations, Profibus cable 150 ohms can be used, easier to find (buy) in the trade.*

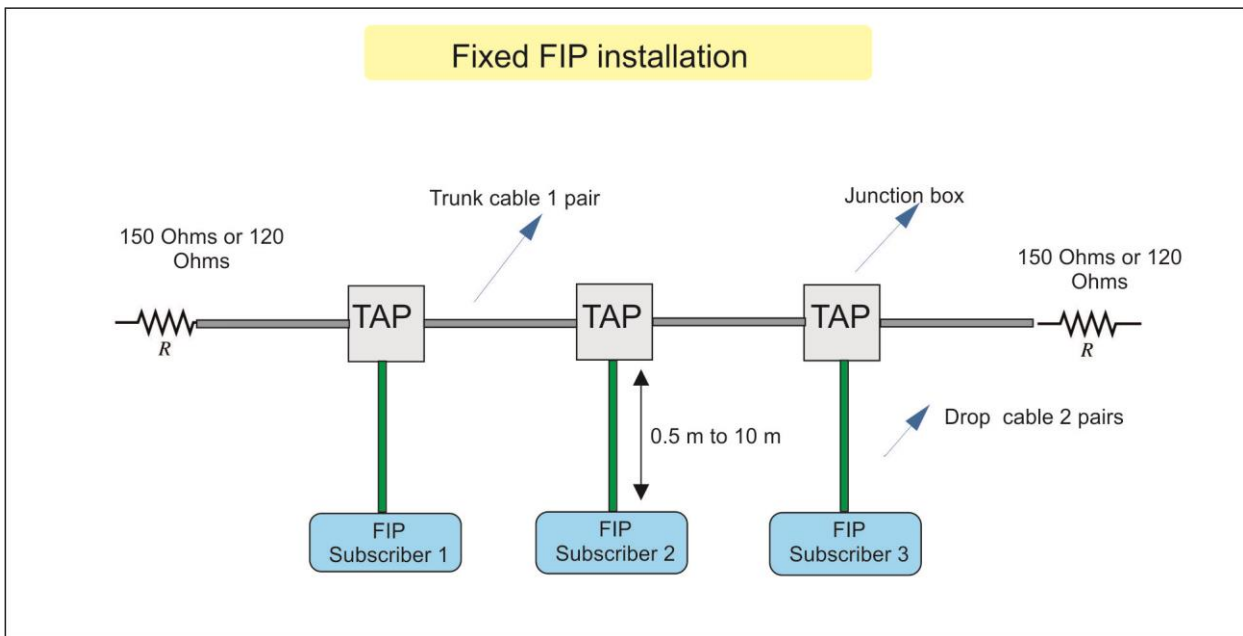
### 4.2. DROP CABLE DUAL PAIR

Electrical characteristics of main cable derive from the standard IBM 6A. Use wire FIP cable 150 Ohms or 120 Ohms (the last one mainly use in railways).

## 5. KIND INSTALLATION

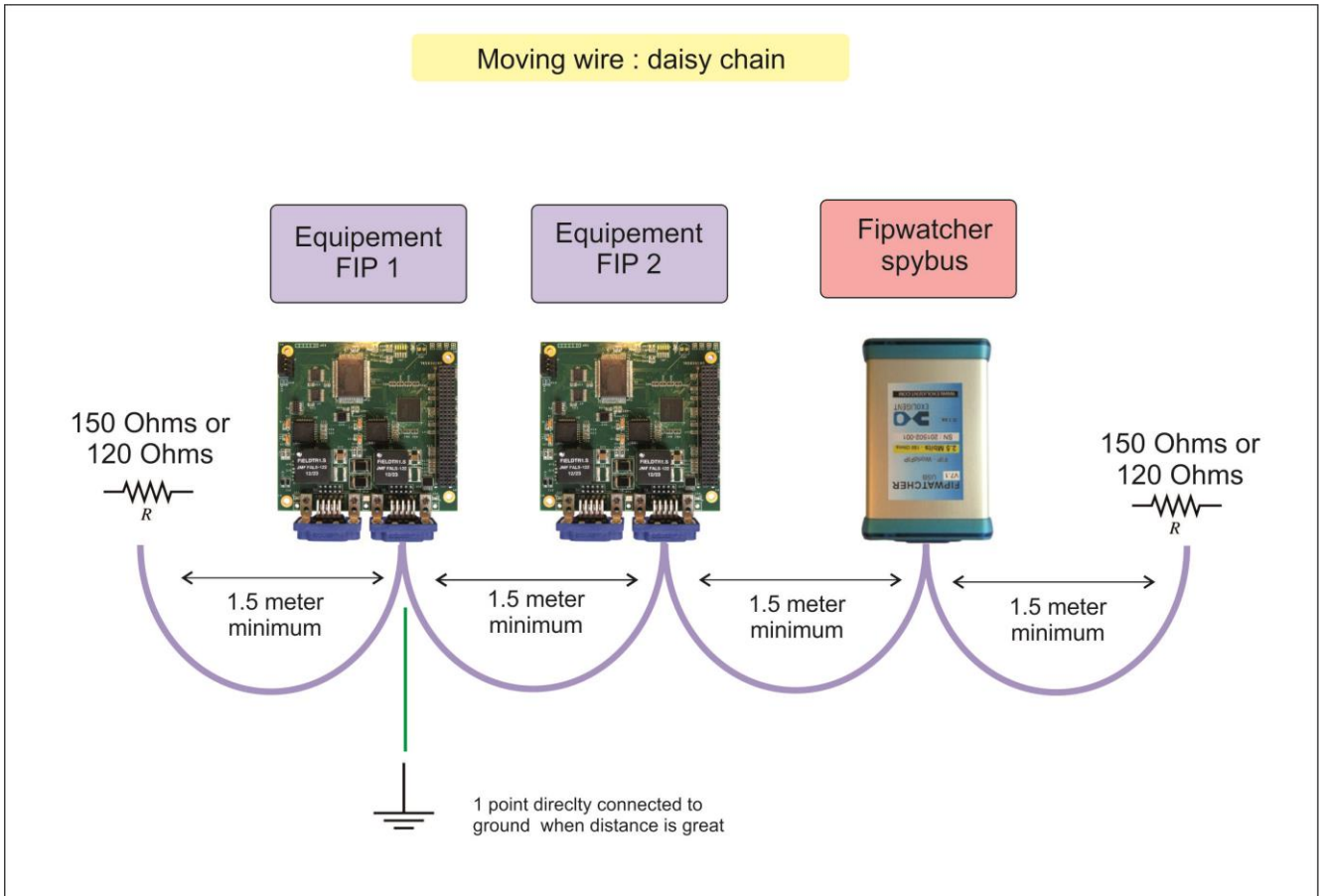
There are 2 kinds of installation : fixed or moving

### 5.1. FIXED INSTALLATION



### 5.2. MOVING INSTALLATION OR DAISY CHAIN

In some case it is interesting to have a moving installation for testing network or equipment.

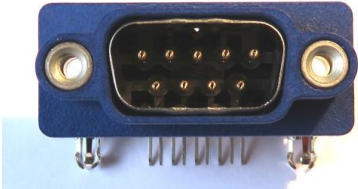
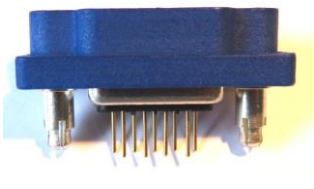


Note : you can use 1 d-sub on our EXOLIGENT card, left or right whatever but only one, the second one is use for redundant network. D-sub are not connected together, it is two independent FIP lines.

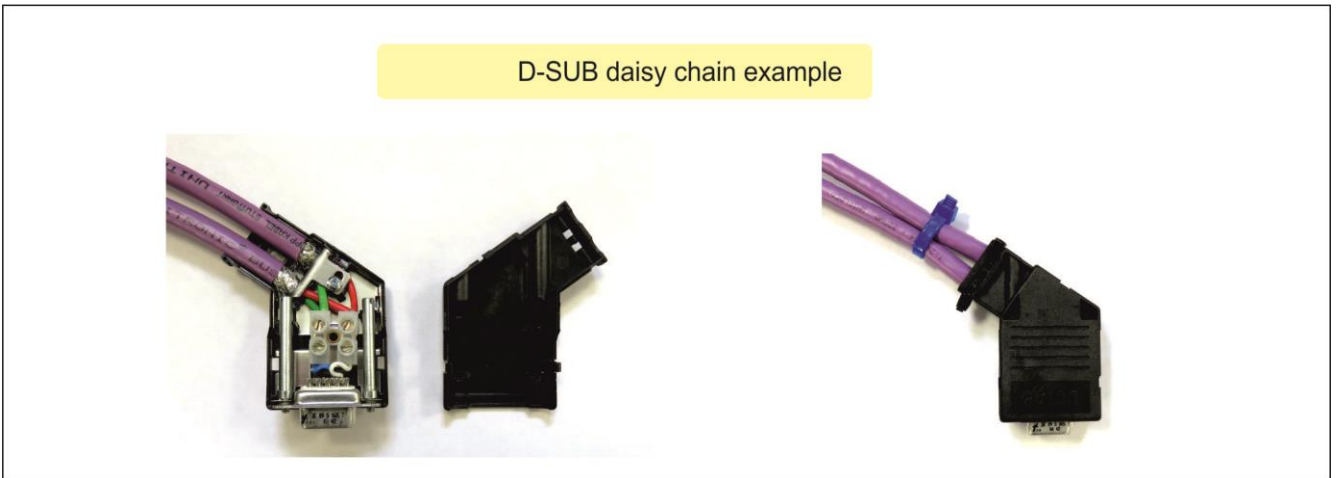
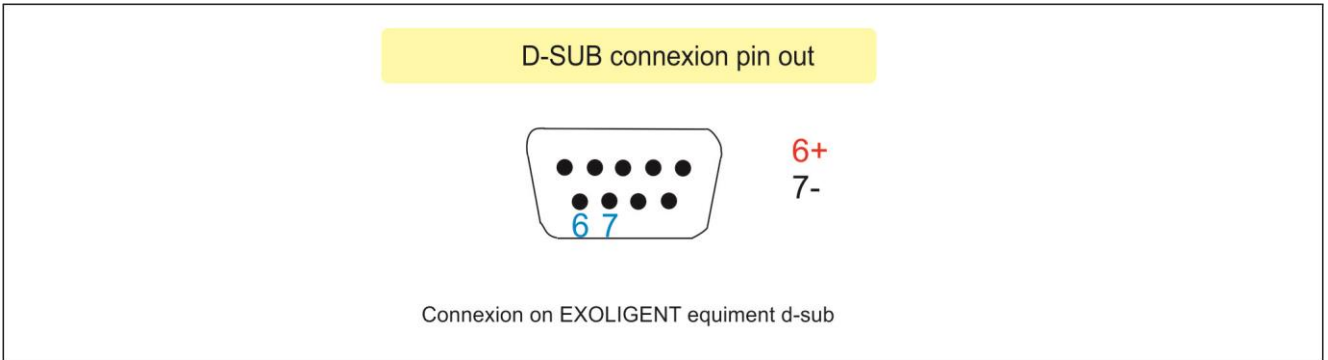
## 6. D-SUB

### 6.1. D-SUB CONNECTION ON EQUIPMENT

D-Sub must isolate “ground of equipment” from “ground of wire”. Ground goes through a capacitor on card.

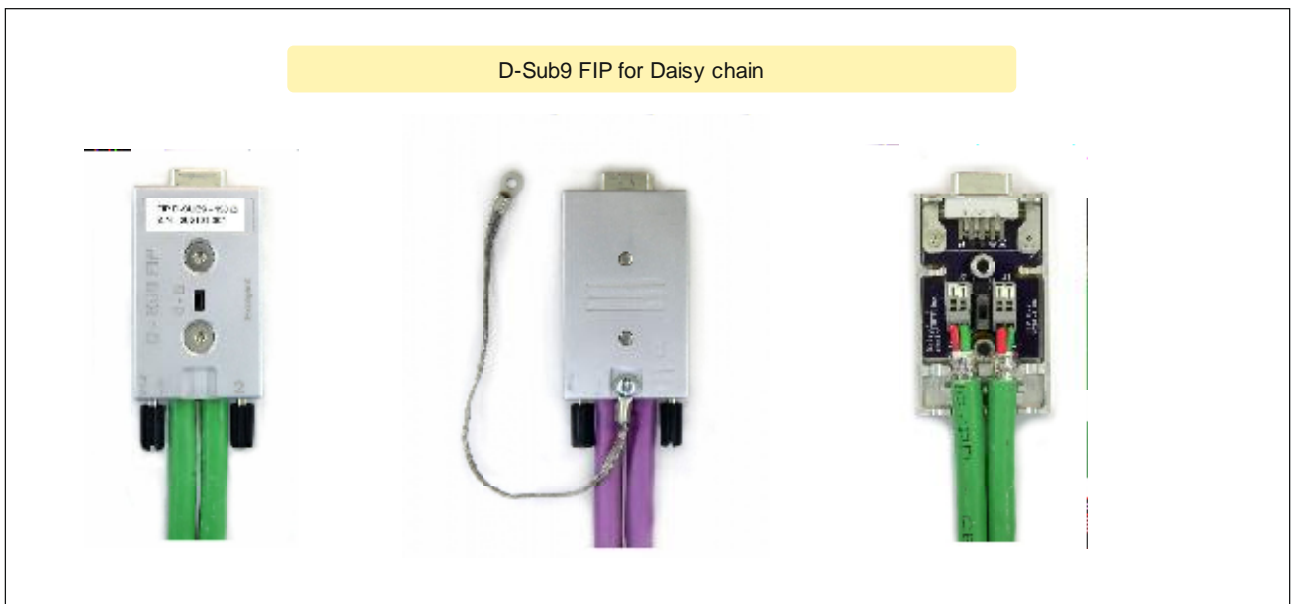
Right angle	Right
	
EXOLIGENT reference : 205-001	EXOLIGENT reference : 205-005

## 6.2. D-SUB CONNECTION PIN OUT



## 6.3. D-SUB CONNECTION ON WIRE DAISY CHAIN

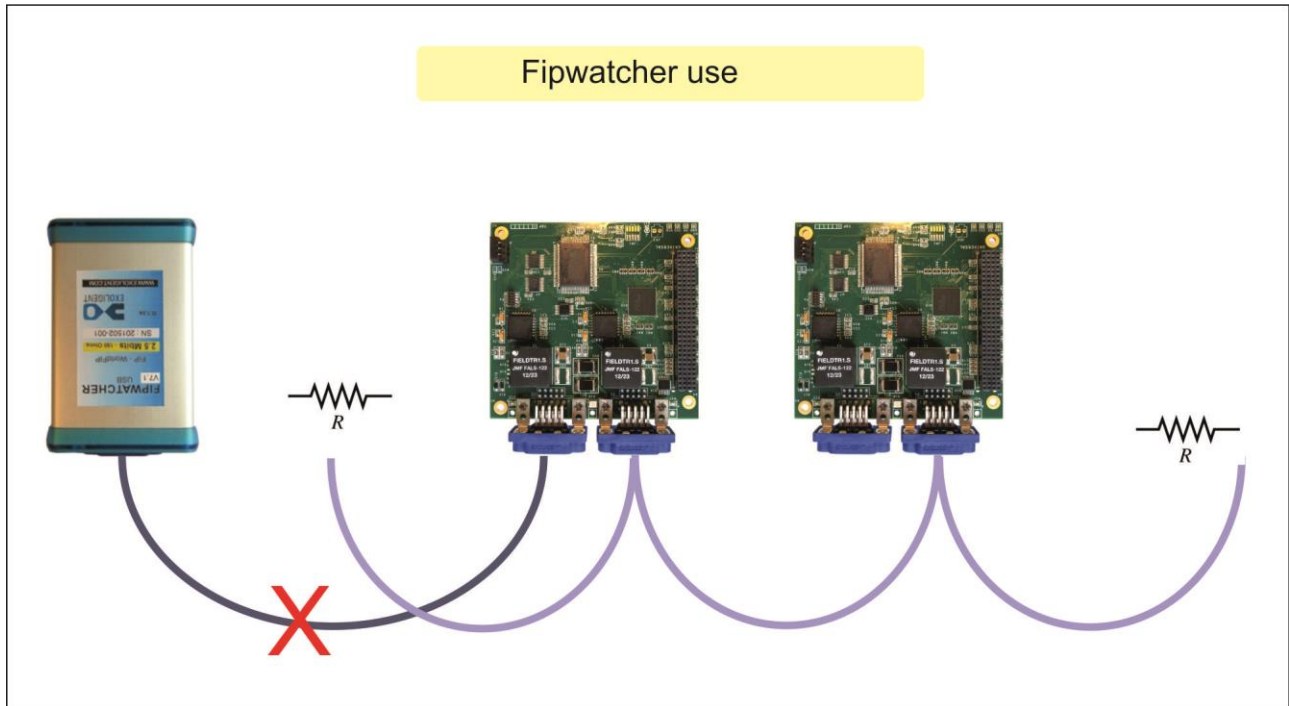
Use D-Sub with electrical protection with part of metal, for hard environment.





## 7. ADDITIONAL EQUIPMENT OR FIPWATCHER INSTALLATION

When you add equipment or use FIPWATCHER spybus you cannot use the second d-sub on our EXOLIGENT card, you must installed as recommended in section 1.6.  
Note that the second d-sub is only for redundant network. See redundant section.



### 8. IMPEDANCE OR LINE TERMINATION (LT)

Impedance must be installed at extremities of wire: 150 ohms or 120 ohms. **Only 2 impedances** per network. You have several possibilities:

Put impedance in a TAP (Deritap). For small installations (50 meters) you can put impedance in D-sub or you can use line termination inside in EXOLIGENT cards.

Line termination inside EXOLIGENT FIP cards

Connexion on EXOLIGENT equipment d-sub, using internal impedance welded on EXOLIGENT FIP cards

Pin OUT	Description
1	FIP + additional
3	FIP - additionnal
6	( + ) standard
7	( - ) standard
8	Internal impedance
9	Internal impedance

**For recent FIP cards**, activation of the impedance is done via the switch, **ON** position indicates the impedance is active.

Line termination inside EXOLIGENT FIP cards, with switch

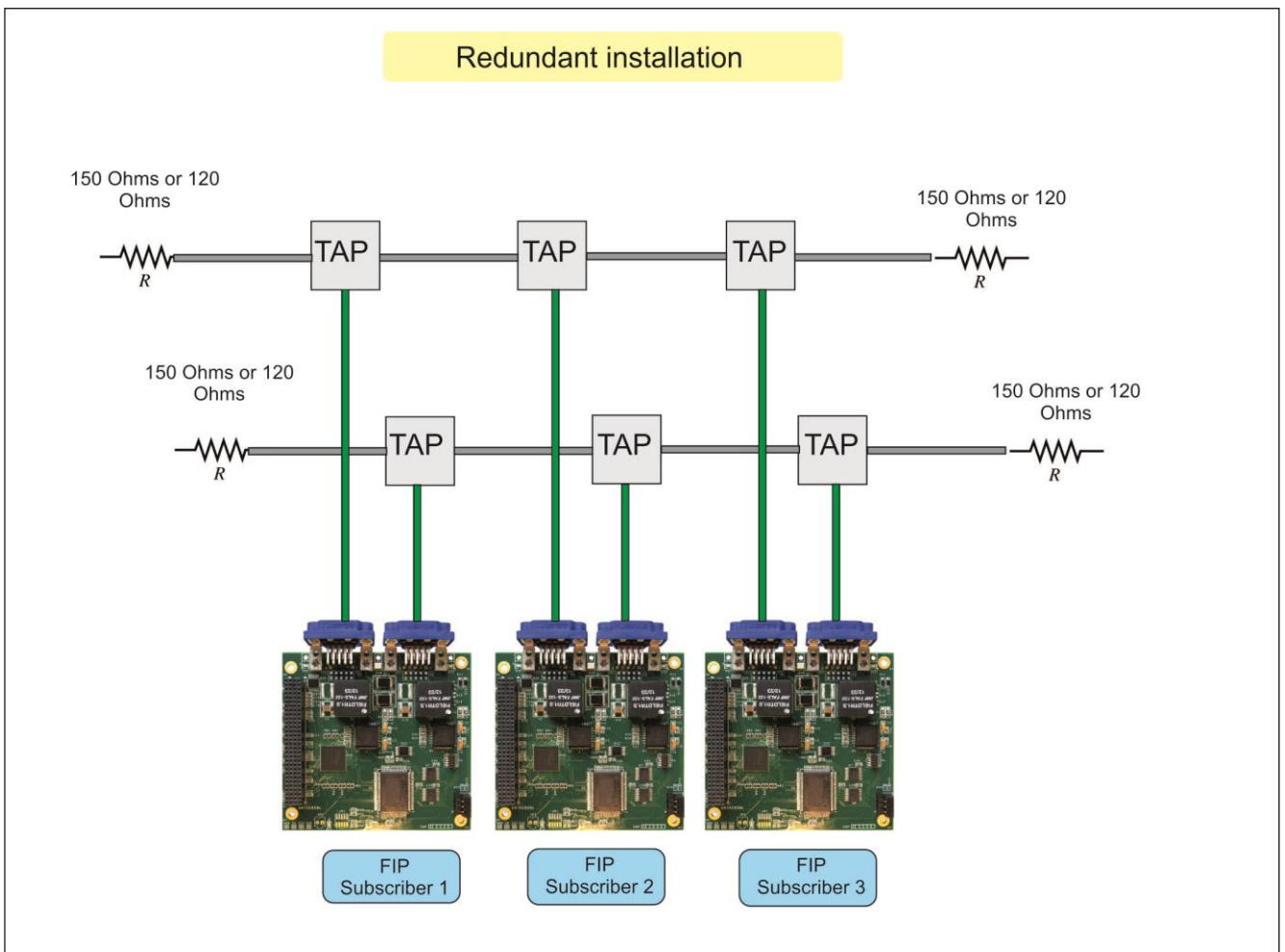
Switch connector -ON : Impedance active

**POWERFIP**

## 9. REDUNDANT INSTALLATION

When medium redundant is use, all components of the physical layer must be duplicated to minimize the risk of damage to the network in the event of an incident.

Components to duplicate in “**redundant bus topology**”: connector of each subscriber, cables, TAP, line termination, repeaters, and active stars.



Note : The worldFIP interfaces (subscribers) supporting medium redundancy can also be used in single medium architectures by using only one of the two connectors.

## 7. DOCUMENTATIONS / VISUELS