The most important tool for industrial network diagnosis is free*

By Dave Tomlin

Introduction

There are many tools out there for monitoring and diagnosis of industrial networks, most of them are quite expensive but can reduce downtime or even prevent it, but they are all limited without…

A **network diagram,** yep a simple network diagram can turn a 3 day headscratcher into a 2hr job to fix. Most installations will be handed over with some drawings done by the installers/manufacturers. Usually as part of the electrical handover documents. In most cases a schematic spread out over the 300 or so pages of documentation along with AC and DC cabling.

The problem with this is that it rarely ever gets updated as changes are made, pages go missing over time and they are quite difficult to follow when your factory is at a standstill, flicking back and forth 20 pages.

Often when I visit a factory to support them when they have a breakdown then there is “one guy” who knows where most of the devices are, and a few who have an idea where some might be. Annotating the drawings with “in cabinet CB04 bottom right” can save a lot of time and stress.

What is the free solution…

Well, it depends on your network:

- For PROFINET then a great free package is PRONETA ([from Siemens]) that will discover all the endpoints on your network, how they are connected, their names and IP addresses and present it in an easy to follow layout that you can tweak to print. 1hrs work and you can put a copy in the documentation folder, network drive and laptop.

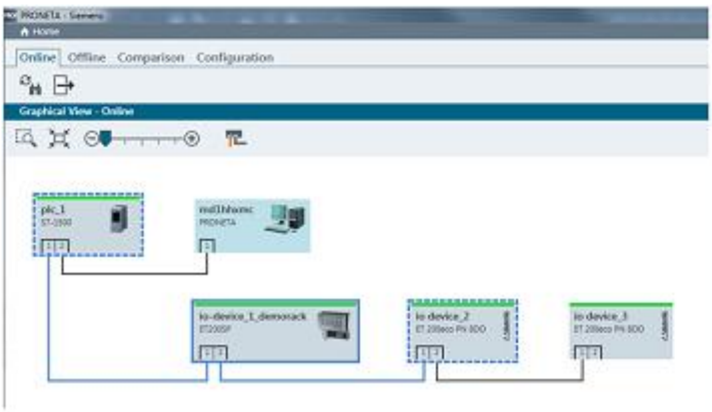
- You can also use our network commissioning tool ([Analyzer IE]) to create network layouts, link utilisation, error checking etc etc.

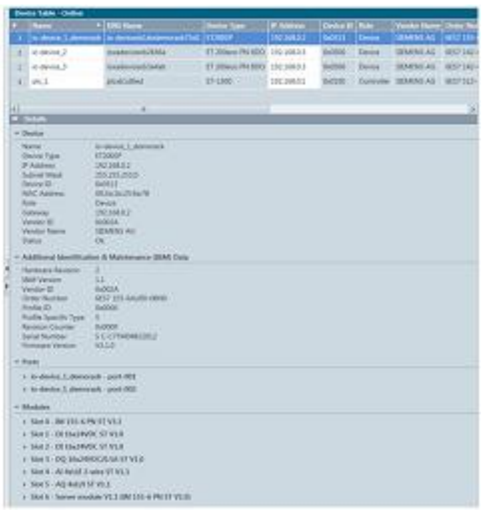
- For PROFIBUS it's a little more manual so while its *free in terms of purchasing it might take a while. It is also a lot easier with a tool like the [Softing PBT5] which can measure distances between devices.
  - You can take your drawing package of choice, I use both Visio and PowerPoint depending on the complexity of the network and try to decipher from the drawings and inspections what order the devices are on the cable, where the repeaters are etc.
  - It helps to physically check (as far as practical) that what is in any existing documentation is correct as in my experience it can be wildly wrong.

Why does having these diagrams make life easier?

Well we can tell a lot about the nature of a problem from the devices that are not responding. In the example image below from Proneta, if IO devices 2 & 3 are missing but all others are present, that suggest a couple of possibilities:

1. The cable coming out of IO device 1 is disconnected/broken/damaged
2. The power to devices 2 & 3 is off
3. "Something else" but much less likely to affect 2 devices

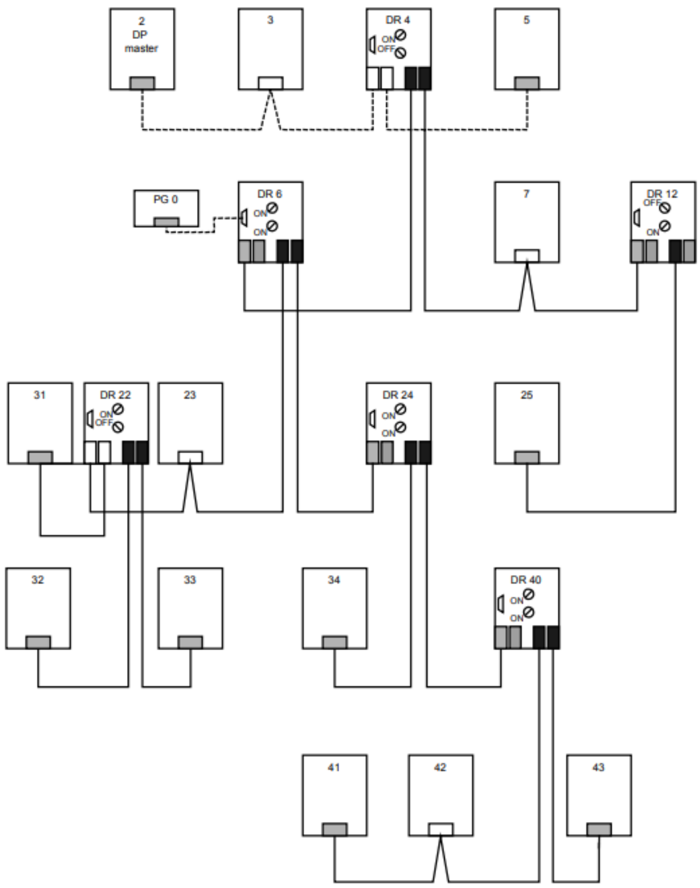




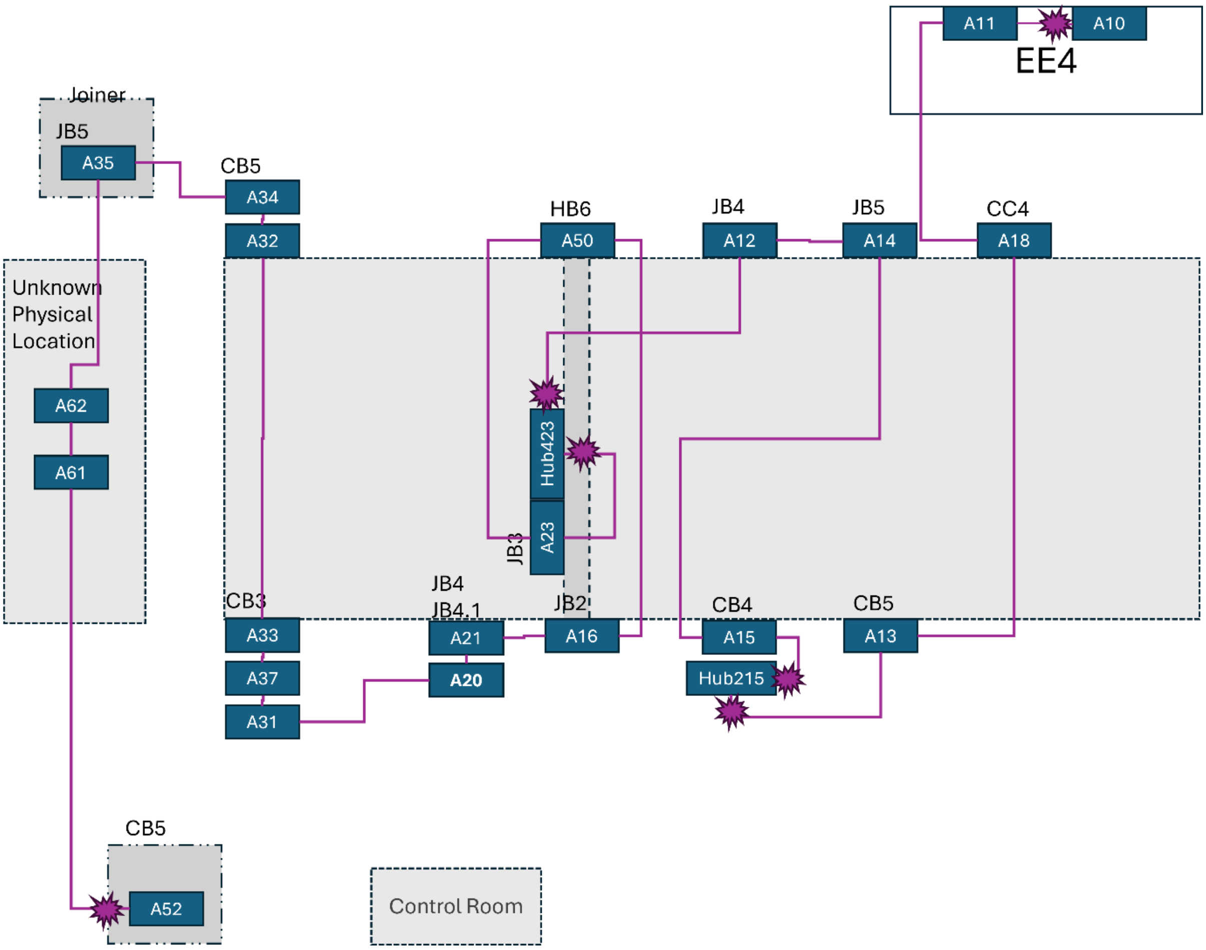
Without the diagram or extensive knowledge of the network you would have to check every cable until you find the problematic one, with this we have a good start on where the problem might be.

Profibus is slightly more difficult because the device addresses don't necessarily tell you anything about the network structure, having accurate layouts is essential. A Profibus network could be 6 devices on "one piece of wire" or 126 devices split up with repeaters up to a couple of kilometers apart. The drawing below could be better but at least it is clear with what is connected to what.

Some locations for each of the devices would make it much better..



This is an anonymised version of a drawing I did recently (about 50% information removed for anonymisation) but a good example of location/cable structure, test locations etc.



How can Hitex help?

Hitex can help you create network diagrams, diagnose problems in both PROFIBUS and PROFINET networks, create commissioning reports and provide training on all of the above so you can be confident when working with these technologies.

Further Information

For more information visit our website: www.hitex.co.uk or get in touch: info@hitex.co.uk. You can also connect with us: LinkedIn

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