

Commissioning Benefits

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- Commissioning Meaning
- Fieldbus Infrastructure
- Commissioning Process
- Commissioning Comparison
- Solve the Commissioning Problems
- Faster Project Startup
- Conclusion

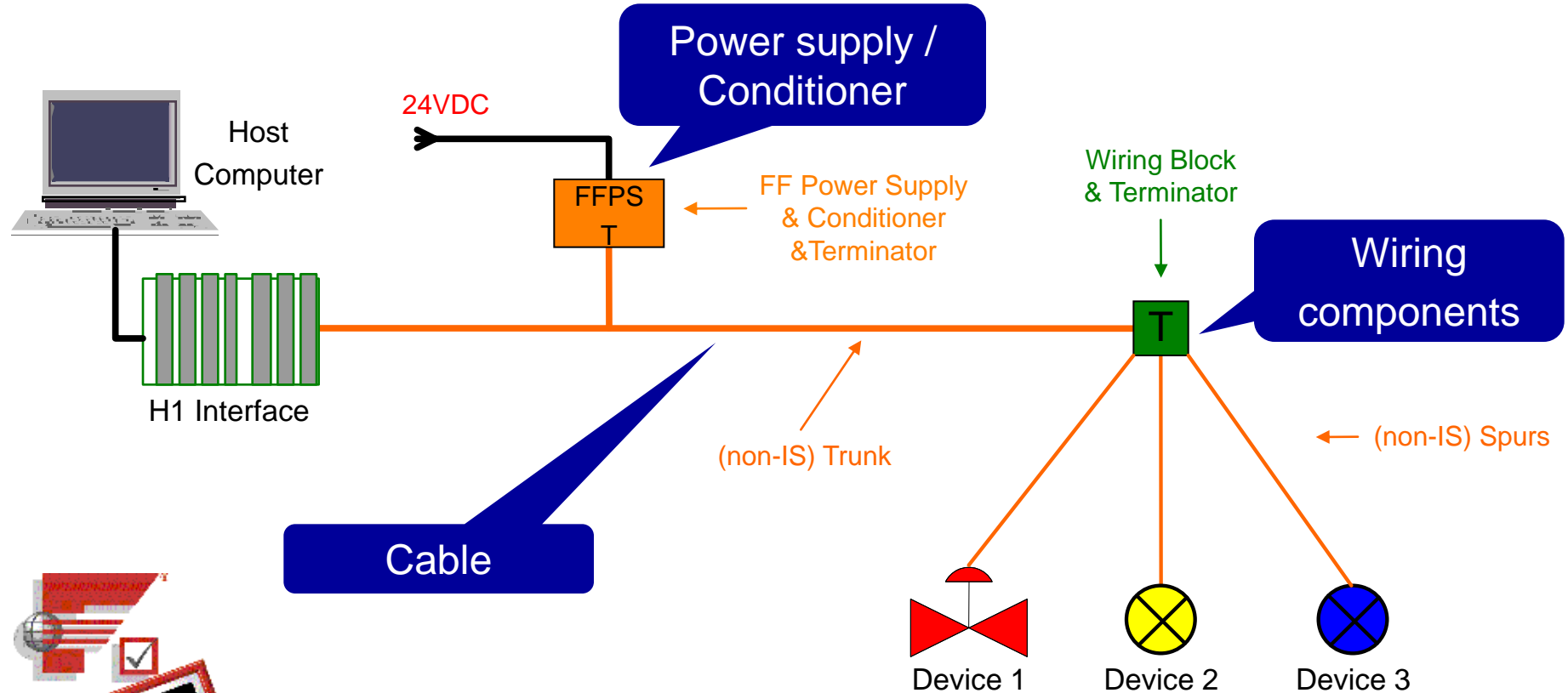
- **Commissioning Meaning**
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- **Target** : Project commissioning is the process of assuring that **all systems** and **components** of a building or industrial plant are designed, installed, tested, operated, and maintained **according to** the operational **requirements** of the owner or final client.
- **When** : A commissioning process may be applied not only to **new projects** but also to **existing units** and systems subject to **expansion, renovation or revamping**.

- **Degree** : In practice, the commissioning process comprises the integrated application of a set of engineering techniques and procedures to check, inspect and test every operational component of the project, **from individual functions**, such as instruments and equipment, up to complex amalgamations such as **modules, systems, and subsystems**.
- **Broader Sense** : Commissioning activities, in the broader sense, are applicable to **all phases of the project**, from the basic and detailed design, procurement, construction and assembly, until the final handover of the unit to the owner, including sometimes an assisted operation phase.

- Commissioning Meaning
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- Practical Case
- Conclusion

Fieldbus Infrastructure



Cable

Power supply / Conditioner

Wiring components

This concept is typically applied to:

- Any kind of instrument in the safe (non hazardous) area
- Ex nA instruments in Zone 2
- Ex d instruments in Zone 1



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4~20mA

- Install the Cables
- Check out the cable installation
- Install the Devices
- Check the device installation

- Install the DCS
- Assigning the I/O
- Calibration the Sensor
- Ranging
- Calibration the 4~20mA
- System Ranging
- System Calibration 4~20mA

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Foundation Fieldbus

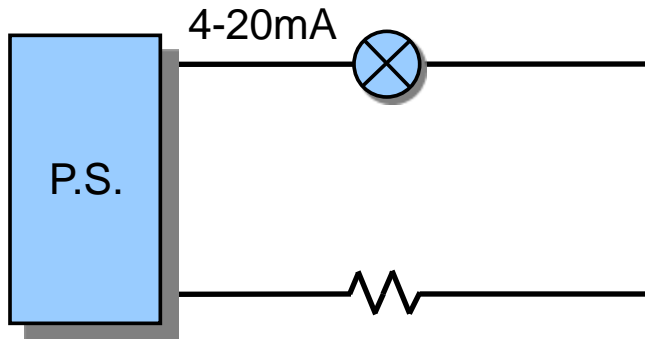
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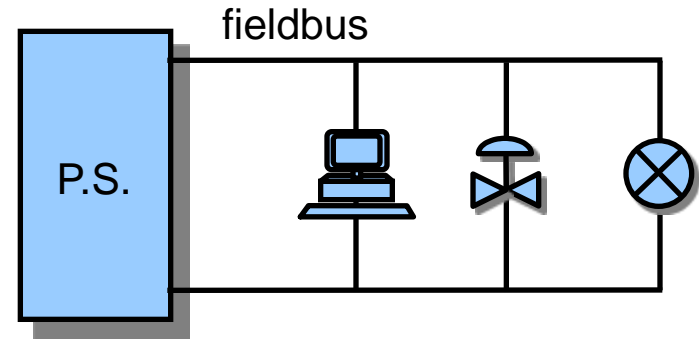
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Install the Cable

4~20mA



Foundation Fieldbus

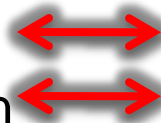


- ✓ Distance and relevant issue
- ✓ Artificial hours and relevant cost
- ✓ Cable connection Quantity
- ✓ Hidden trouble points

Commissioning Comparison

4~20mA

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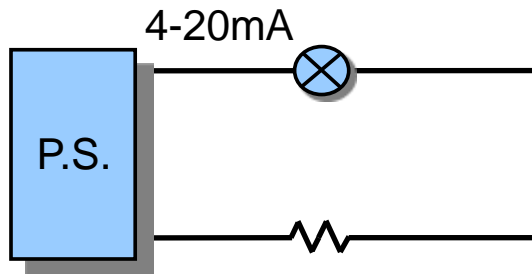
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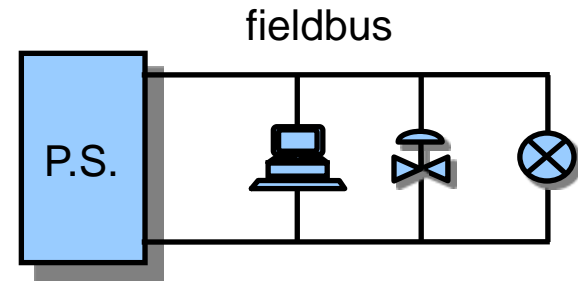
Check out the cable installation

4~20mA



- ✓ Distance and connection Quantity
- ✓ Tools

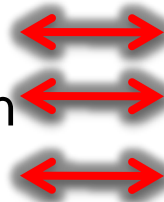
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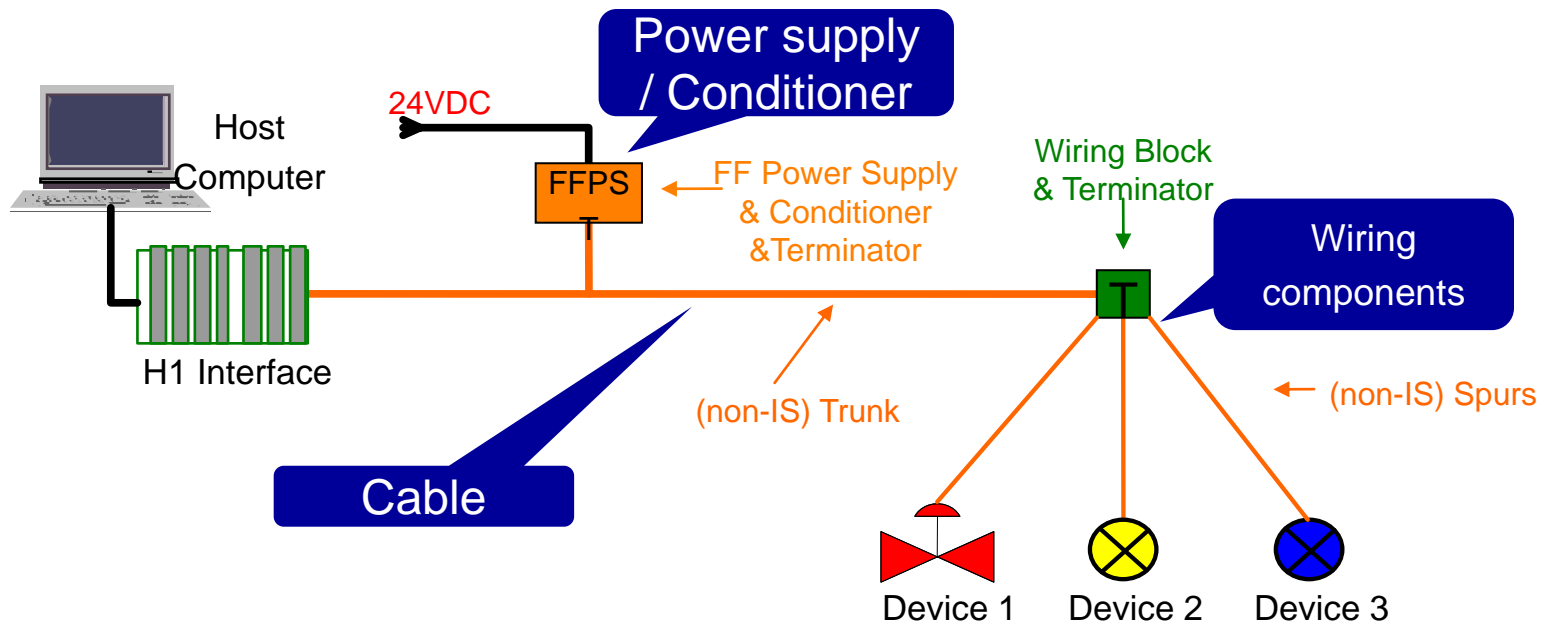
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4~20mA

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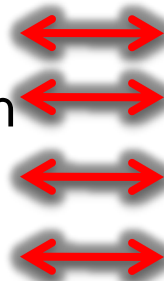


- ✓ Almost the Same
- ✓ Power Line Cable

Commissioning Comparison

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Foundation Fieldbus

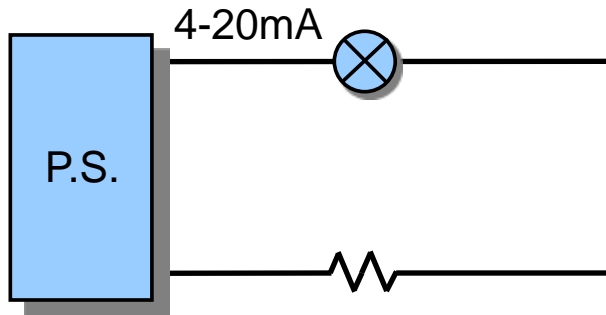
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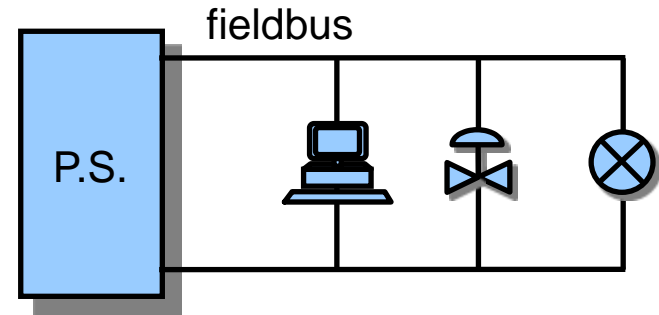
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Check the device installation

4~20mA



Foundation Fieldbus

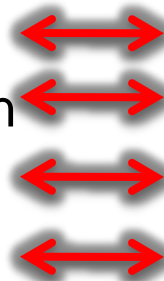


- ✓ Power channel means signal channel
- ✓ Differential signal fault tolerance performance
- ✓ Tools

Commissioning Comparison

4~20mA

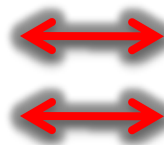
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Assigning the I/O

- Foundation fieldbus devices are recognized by three mechanisms: a **traditional node address** for communication, a human **readable device tag** corresponding to the project P&I diagram, and a **unique identifier** allowing the system to automatically resolve any tag or address conflicts.
- The system **automatically assigns** the address to **all devices**, avoiding human errors such as address duplication associated with manually managed protocols, and saving time.
- Therefore technicians work **based on tag** and need not be concerned with address.
- Thanks to the **unique identifier**, multiple devices can be connected and **commissioned at the same time**. It is plug-'n'-play.

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Foundation Fieldbus

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- N/A

- N/A

- N/A

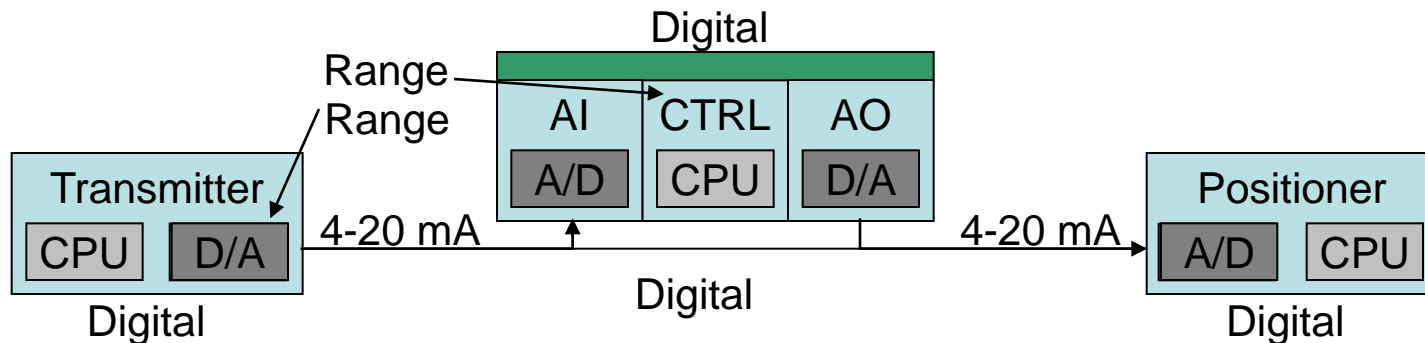
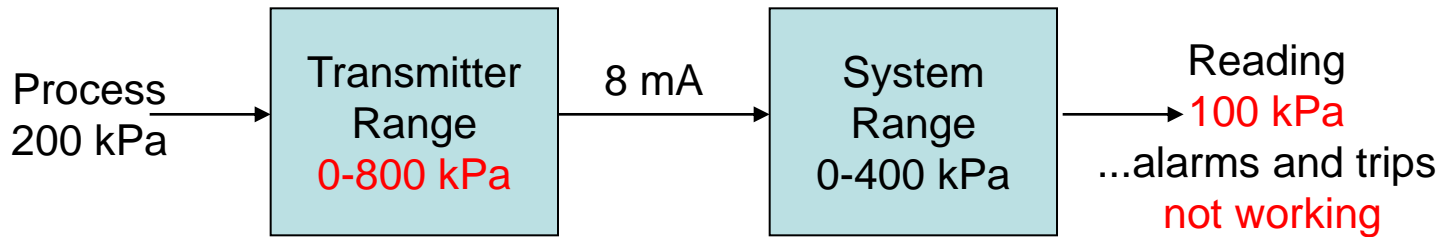
- N/A

Easier - Real Number Engineering Unit

- No range mismatch
- Unit downloaded when device is replaced

Range mismatch

Range exceed
(more than 100%)



Solve the Commissioning Problems

Commissioning



Find problem



Issue Identification

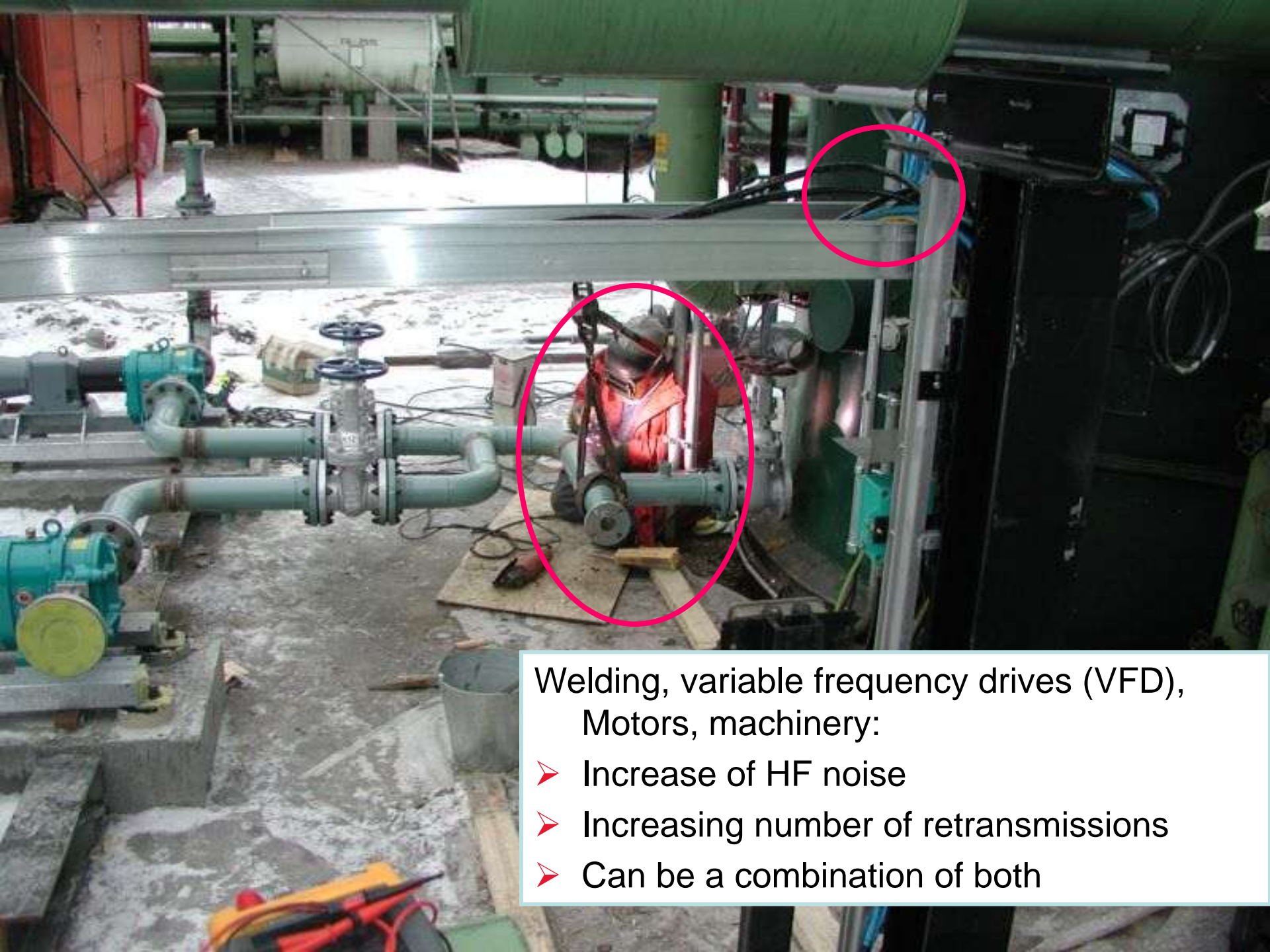


Improvement and maintenance



Commissioning again

Problems Resolved



Welding, variable frequency drives (VFD),
Motors, machinery:

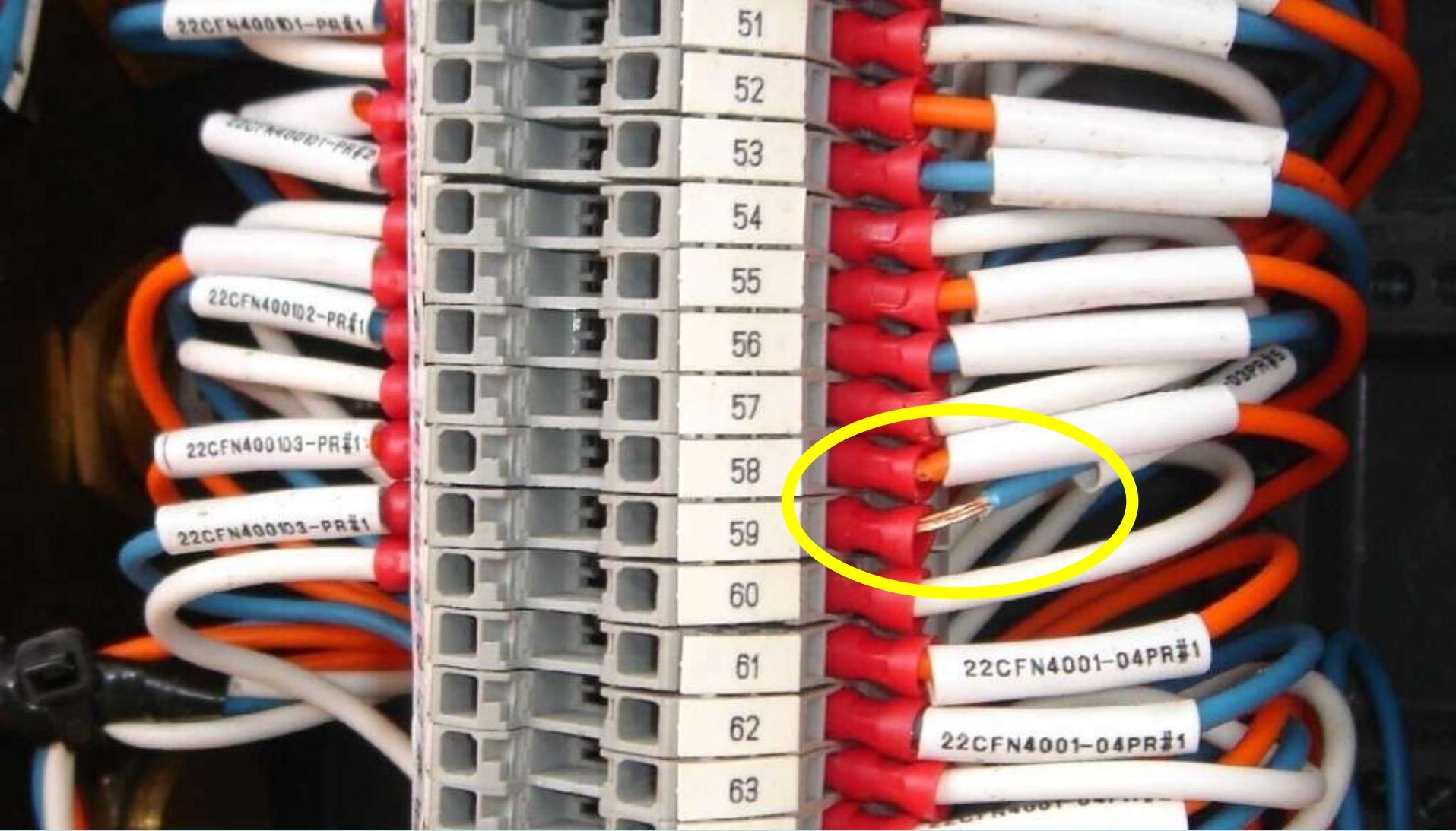
- Increase of HF noise
- Increasing number of retransmissions
- Can be a combination of both

Case study: faults in operation



Cable jacket stripped back too far can cause instrument malfunction:

- Water ingress
 - Wires shorted to housing
 - Corrosion
 - Tearing wires (increasing resistance)
- Increasing number of retransmissions
 - Signal amplitude rises
 - Increase of FF noise
 - Can be a combination of above



Wires coming out of ferrules:

Spur:

- Device drops off (may or may not return)
- Increasing number of retransmissions

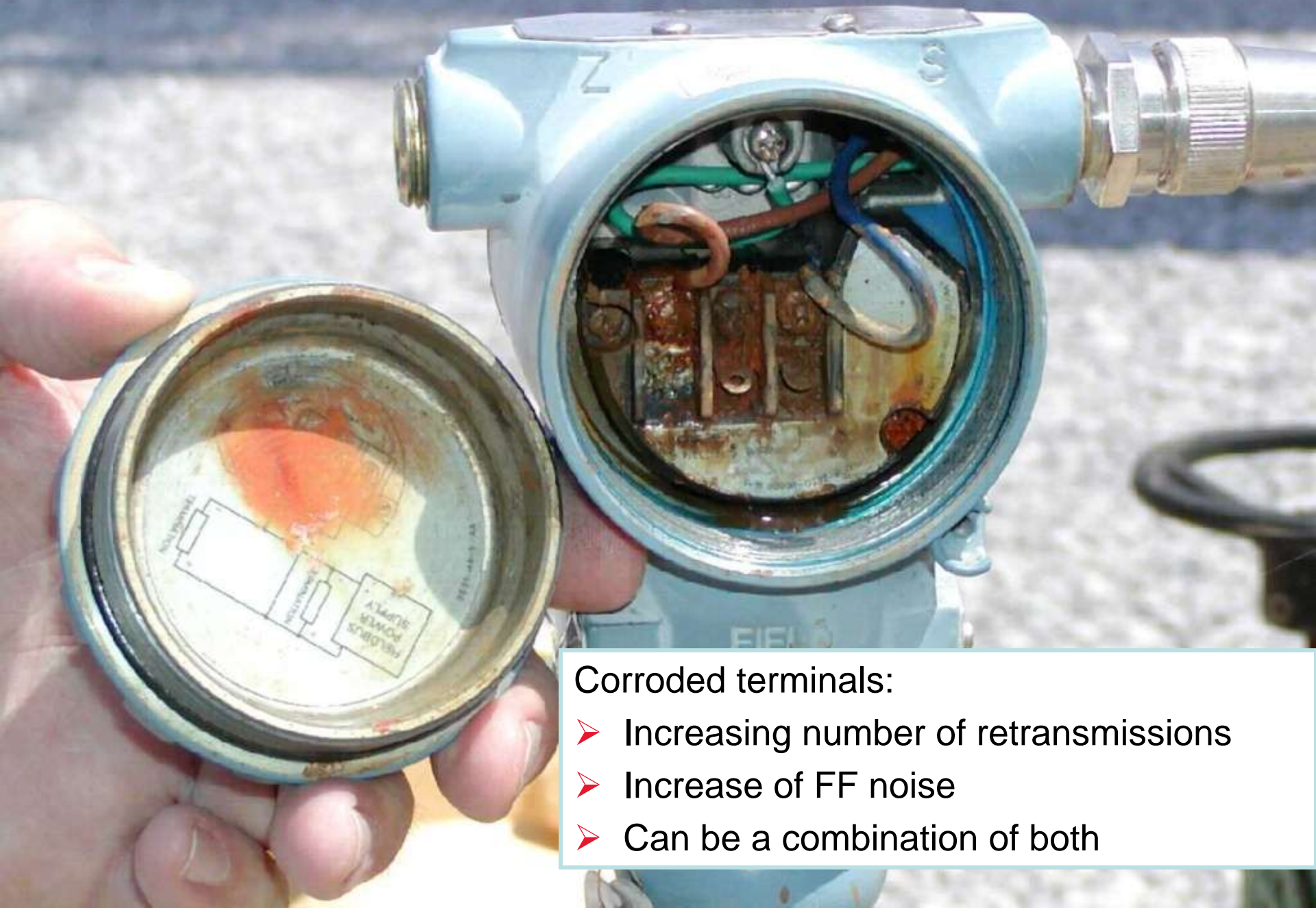
Trunk:

- Devices drop off (may or may not return)
- Signal amplitude sometimes ok, sometimes high
- Increasing number of retransmissions

Bend radius too tight, Upward facing gland risks water ingress



Two cables into one gland prevents sealing of gland

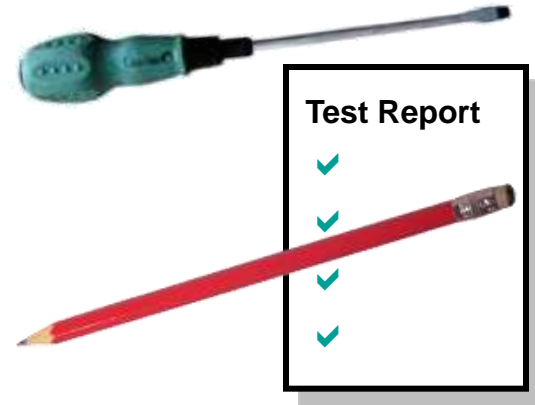


Corroded terminals:

- Increasing number of retransmissions
- Increase of FF noise
- Can be a combination of both

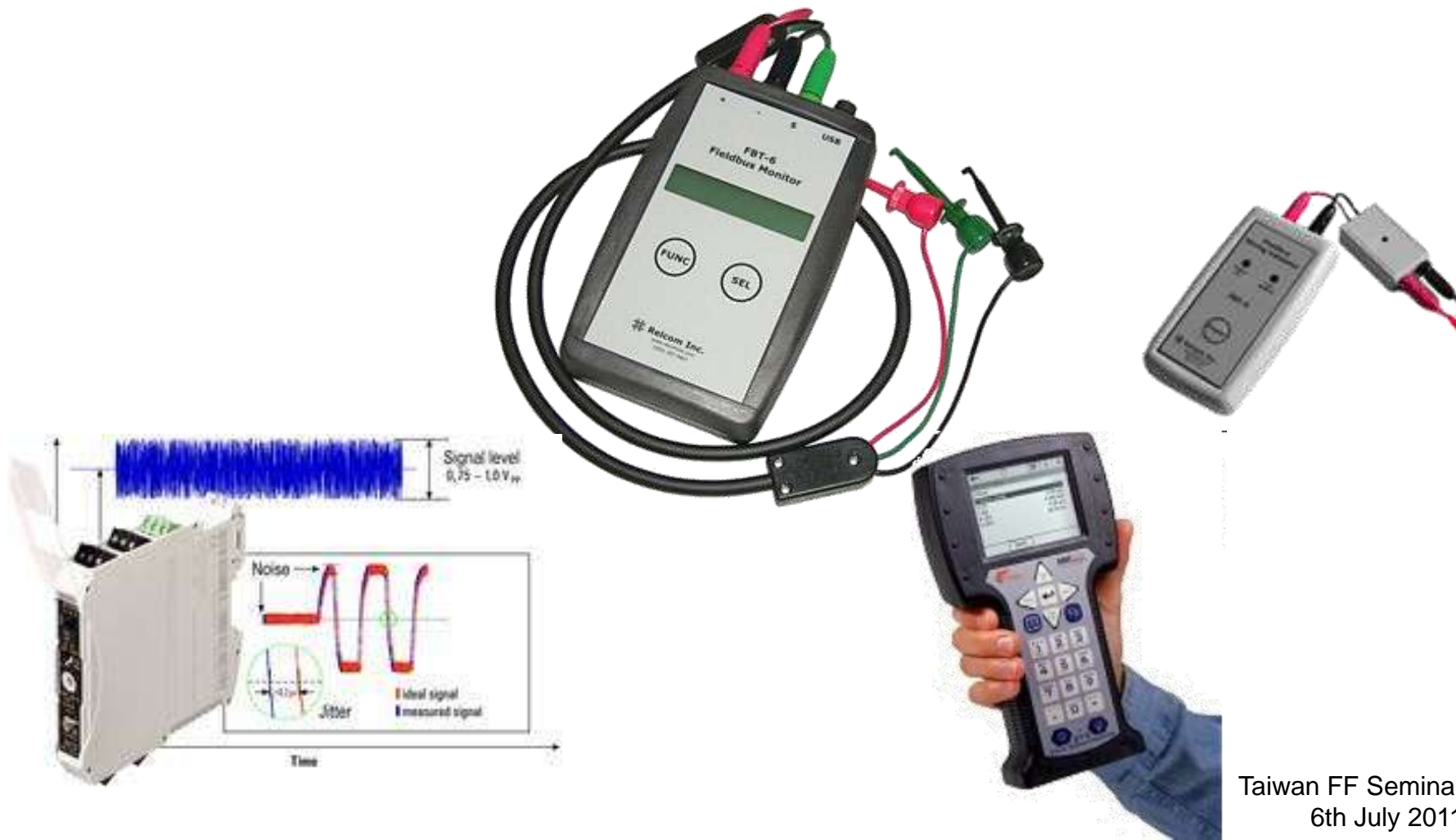
Commissioning in the Past

- Always on the critical path
- Manual, step-by-step procedure
- Labor intensive
- Requires
 - Screw driver
 - Check sheet
 - Pencil
 - Multimeter
 - Oscilloscope
- Connect one device at a time
- Disconnect after testing

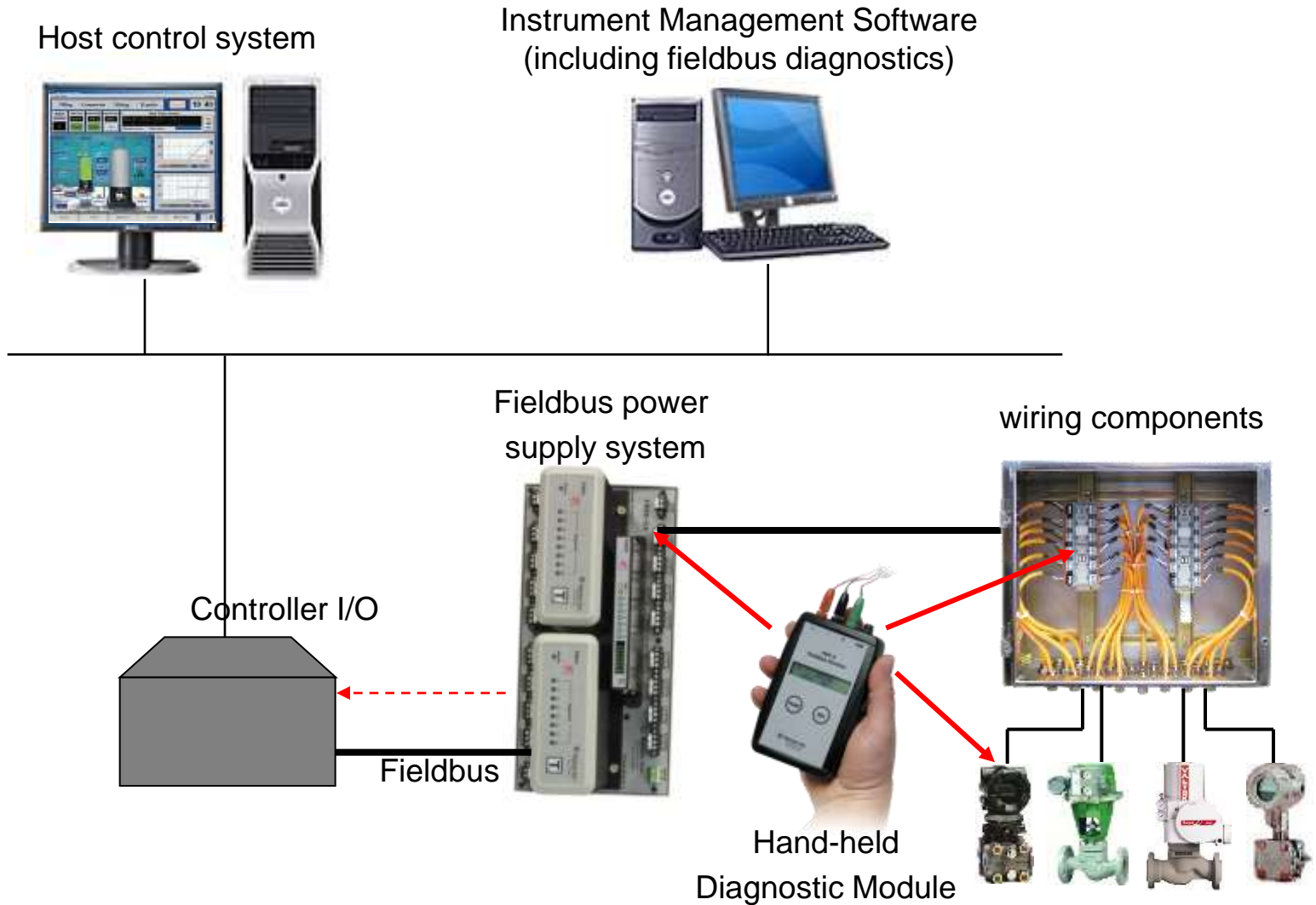


Commissioning tool renovation

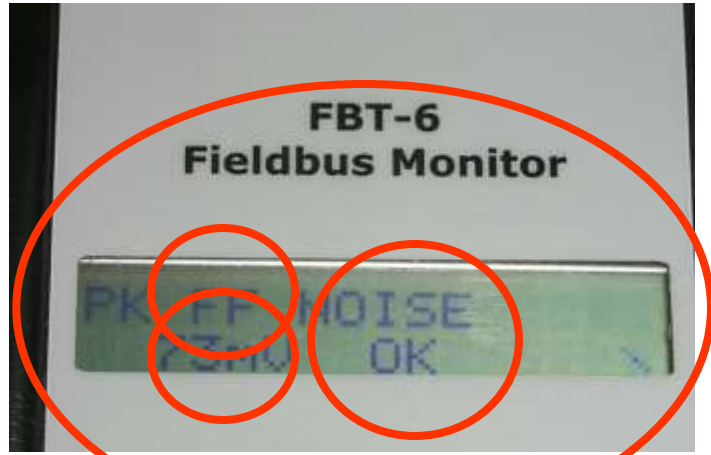
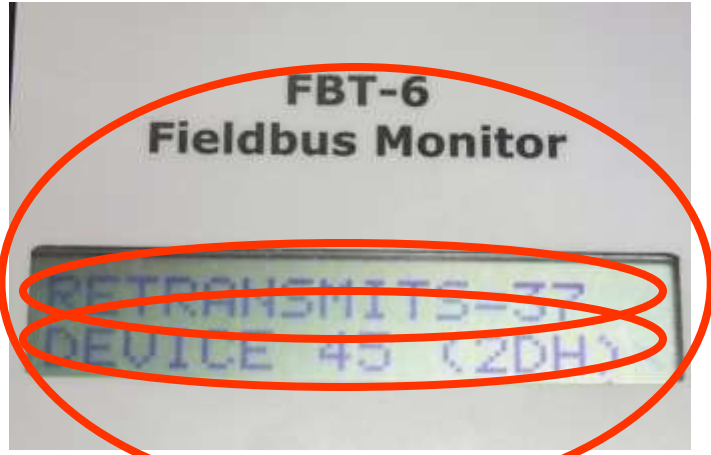
- A portable tool for commissioning, monitoring, and troubleshooting. Versions to suit your every need.



Portable Commissioning tools



Tell you the conclusion



- ▶ Retransmits:37
- ▶ Device:45

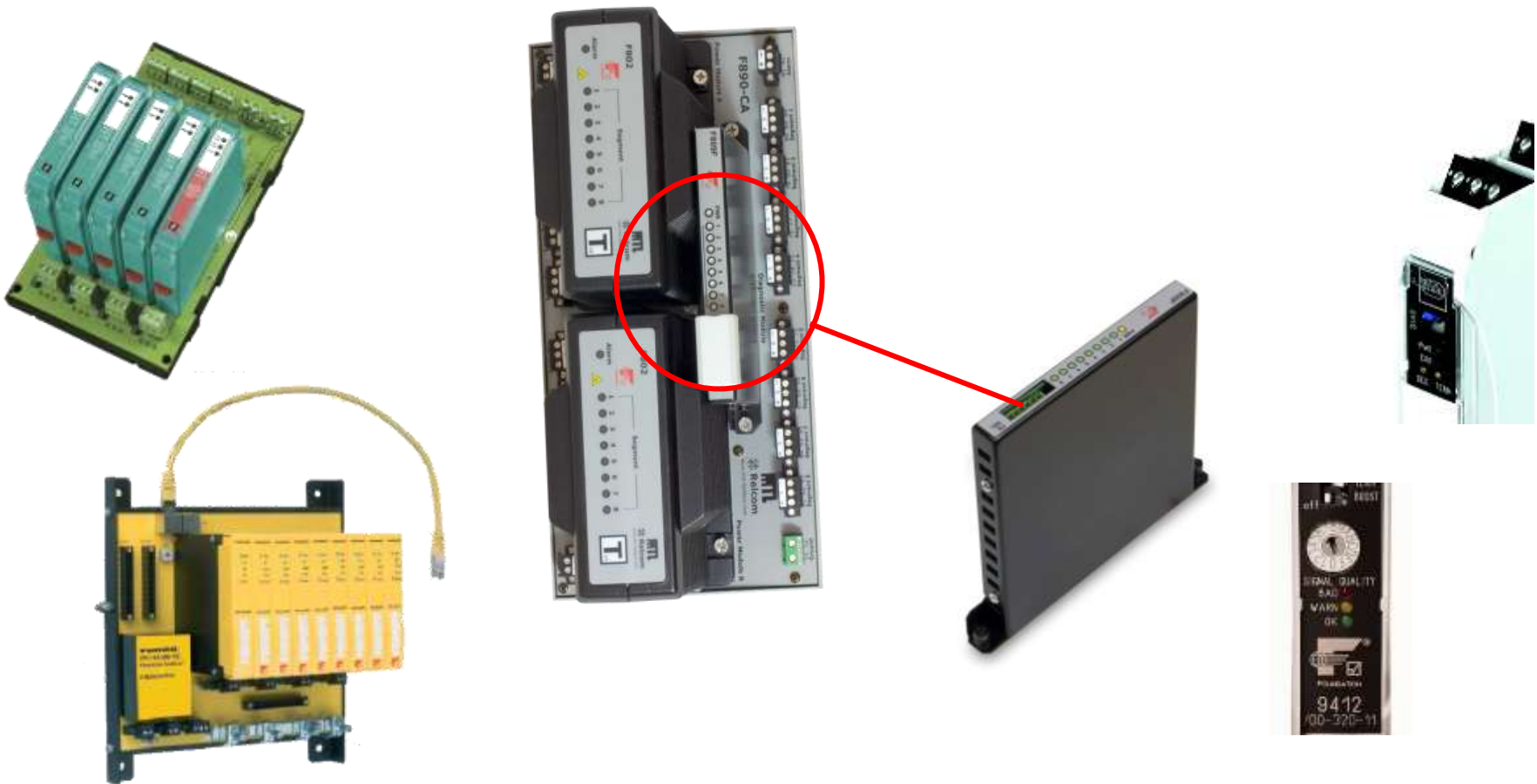
- ▶ NoiseBand:FF Band
- ▶ Amplitude:73 mV

- ▶ OK Or Bad ?

- ▶ **OK**

Commissioning tool renovation

- Integrated single tool for commissioning, monitoring, and troubleshooting. Versions to suit your every need.



Solve the Commissioning Problems

Commissioning



Find problem



Issue Identification



Improvement and maintenance



Commissioning again



Problems Resolved

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Faster Project Startup Express and Batch Download

- Reduced commissioning time

Express Fieldbus Download

Express Download temporarily disables scheduled communications on the fieldbus and is intended only for plants that are starting up and commissioning fieldbus segments. It is not intended for use with a fieldbus segment currently controlling the process.

Expand the nodes and click the checkbox next to the objects you want to download.

Exclude decommissioned devices
 Exclude ports and devices which do not need to be downloaded

Express Download (Suspends Control)
 Accept all system-selected items for download

Path	Type	Needs Downloading	Commissi
Control Network	Control Network		
CTLR1	Controller		
I/O	I/O		
C01	Fieldbus H1 Card, 2 Ports, Redundant		
P01	Fieldbus Port	No	
C01P120-3242R01	Fieldbus Device	No	Yes
C01P121-3242R01	Fieldbus Device	No	Yes
C01P122-3242R01	Fieldbus Device	No	Yes
C01P123-3242R01	Fieldbus Device	No	Yes
C01P124-3242R01	Fieldbus Device	No	Yes
C01P125-3242R01	Fieldbus Device	No	Yes
C01P126-3242R01	Fieldbus Device	No	Yes
C01P127-3242R01	Fieldbus Device	No	Yes
C01P128-3242R01	Fieldbus Device	No	Yes
C01P133-FFVCTR02	Fieldbus Device	No	Yes
C01P135-DPLOTR01	Fieldbus Device	No	Yes
P02	Fieldbus Port	No	
C03	Fieldbus H1 Card, 2 Ports, Redundant		
C05	Fieldbus H1 Card, 2 Ports, Redundant		
C07	Fieldbus H1 Card, 2 Ports, Redundant		
C09	Fieldbus H1 Card, 2 Ports, Redundant		
C11	Fieldbus H1 Card, 2 Ports, Redundant		
C13	Fieldbus H1 Card, 2 Ports		
C14	Fieldbus H1 Card, Series 2, 2 Ports		
C15	Fieldbus H1 Card, 2 Ports, Redundant		
C17	Fieldbus H1 Card, 2 Ports, Redundant		

Buttons: Download, Cancel, Print

- Initiate multiple downloads at the same time
- Runs unattended
- At pre-commissioning need not run as a background communication to real-time control

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- Installation and Checkout
 - Work load
 - Convenient
- Calibration and Ranging
- Addressing Change
- Solve the Commissioning Problems
 - Issue Identification
 - Improvement and Maintenance
- Project Startup
-

- ✓ Save Time
- ✓ Cost Reduction
- ✓ More Efficient
- ✓ Raise Benefit

Questions ?

Thank You !