

Exemple de support d'étude (en deuxième année)

Organisation de la séquence :

Situation déclenchante (2 séances)	Vidéos 1 – What is a lan ? 2 – Subnet Mask 3 – Lan and remote communication 4 - hmi Chaque vidéo donne lieu à un travail de groupe et un échange conduisant à un résumé (principales informations techniques, vocabulaire, constituants...)
Travail de groupe (3 séances)	Sujet élève : Industrial network Chaque groupe s'approprie le contenu technique et le vocabulaire anglais approprié aux différents items attendus dans la vidéo Le « story board » est progressivement défini et validé. Les critères d'évaluation utilisés sont précisés.
Prise de vue et montage (1 séance et travail maison)	Chaque groupe réalise les rushes nécessaires en utilisant les ressources disponibles (copies d'écran, téléphones portable....). Il est important que chaque étudiant du groupe ait une intervention personnelle parlée dans la production finale.
Restitution	Chaque groupe présente sa production devant la classe. Chaque présentation est suivie d'une discussion collective afin de confronter la production aux exigences du sujet et aux critères d'évaluation.

Documents nécessaires:

Videos: 1 – What is a lan ?
2 – Subnet Mask
3 – Lan and remote communication
4 - hmi

Sujet : « industrial networks »

Ressources Programmes automates
Programmes IHM

Critères d'évaluation :

Ces critères sont précisés aux élèves durant le travail de groupe, et avant la réalisation de leur vidéo.

- 1 – Réponse à la demande :** cohérence de la production avec les attendus de la vidéo définie dans le texte
- 2 – Pertinence technique :** exactitude et niveau d'expertise des informations techniques de la production.
- 3 – Maîtrise de la communication technique :** exactitude du vocabulaire, maîtrise de la langue et de la grammaire.
- 4 –Fluidité de la communication :** cet item concerne la production dans son ensemble mais aussi la participation individuelle à la discussion qui suit la présentation.

Industrial Networks

In the BTS ELT Workplace, you can find many technical systems, including network connected devices (PLCs, HMIs, Electronic cards...)

Most of them use the TCP/IP protocol to communicate through the native Ethernet network of the Highschool (for example, the Main Low Voltage Panel)

The IP addressing of all those devices is not currently satisfying, because they are all in the subnet 192.168.0/24 which is not the LAN (Local Area Network) of the Highschool (172.16.112.0/20)

With the currently used subnet, the personal computers and laptops cannot reach the devices

- to modify, upload and download programs and configurations
- to monitor the data, functioning curves...
- to simulate new behaviors before implementing modifications

What you have to do :

You are asked to work on the network configuration of two systems, controlled by the same HMI:

- The pumping system
- The start/stop system for asynchronous motors

The HMI (by Schneider Electric) will be configured using the software “Vijeo Designer”, your teacher will give you the current program.

The PLCs are both TWIDO devices, connected to a specific ethernet bridge (both by Schneider Electric), using natively the “Twidosuite” software, but you can also use the “somachine basic” software to implement your new configuration...

In groups of 3/4 students you are going to carry out the modification of the network parameters (HMI, PLCs...) in order to join the subnet 172.16.112.0/20.

You will have to use free consecutive IP addresses (ask your STI teacher...), and you have to test if they are already not used (using the “ping” command of a computer in the administrator mode...)

Pay attention to the procedure you use, because this is what you are asked to report about!

Your Report:

You are going to produce a **“How To” video**, explaining for any user:

- ⇒ What is the structure of the Ethernet network used in the H2 110, H2 111, H2 112 workplaces of the highschool (diagram structure welcome, including all the network devices of both systems, and others if necessary!).
- ⇒ How to determine the subnet mask of the highschool’s Network, and what’s the use of it.
- ⇒ The main useful commands of a computer allowing users to see the IP address, the subnet mask, the default gateway (and what it means...)
- ⇒ The procedure that any user can follow in order to change the network settings of the PLCs and the HMI of the pumping and start/stop systems
- ⇒ The procedure to test the new settings

Your Deadline:

- You will have to achieve your video (**Deadline: 12th of December – 10 AM**) after 5 weeks of work (2 hours a week... and your homework, of course!)
- All the productions will be projected and evaluated in front of the entire group on the 19th of December.

Some links to help you:

Talking about LANs and WANs:

https://www.youtube.com/watch?v=LCj2HDOd_Mk

<https://www.youtube.com/watch?v=0Y0dGfrUQiw>

https://www.youtube.com/watch?v=C5o33W_2QI

Talking about subnet masks and computer's communication:

<https://www.youtube.com/watch?v=yLeuGOOrUvo>

<https://www.youtube.com/watch?v=Xb1JA5CissI>

<https://www.youtube.com/watch?v=etfmoO4mSfE>

(The last one is a little bit long (20'), but clearly explains every network notion you have to learn before beginning your work....)

Talking about HMIs and PLCs

<https://www.youtube.com/watch?v=kujHQgK352o>

ENJOY!!