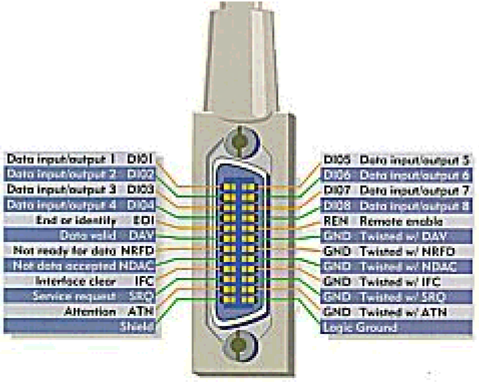
GPIB [1] ≡ IEEE488 ≡ IEC625 (≡ HPIB)

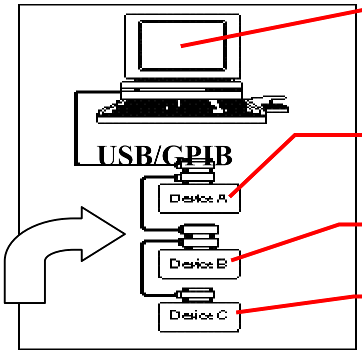
(http://www.hit.bme.hu/people/papay/edu/ieee488.htm)

IEEE488.1 - byte transfer: T/L (Talker/Listener) protocol, 3 wire hardware HDSK (handshake)

GPIB-signal drivers must be open collector logic which allows for a **parallel, multidrop** connection of **all** devices. Logical TRUE and **data 1** is defined for voltages < 0.8V and FALSE, **data 0** for >+2V (ca. TTL levels).

The **24** bus lines group into 4 categories:





PC: *IntuiLink*

Scope (FFT)

ARBgen

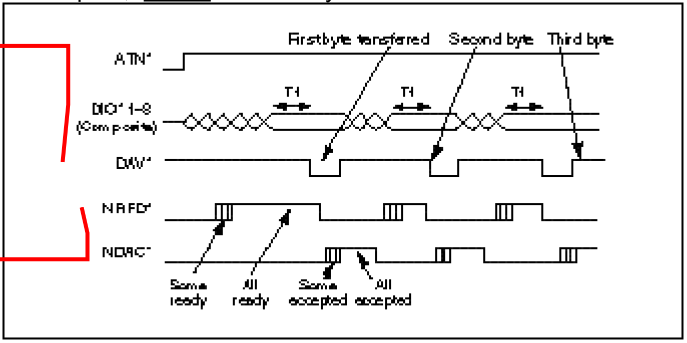
DMM

- **Data** lines: **8** lines DIO1 - DIO8, used to transfer data and commands, **one byte at a time**.
- **Handshake** lines: **3** - used to control (handshake) the transfer of information on the data lines.
  DAV: Data Valid, NDAC: Not Data Accepted, NRFD: Not Ready for Data

információ **adó**
(**T: TALKER**, v.
controller: PC)

szelektív adatátvitel:
címzett készülékek

információ **vevő(k)**
(**L: LISTENERs**, v.
mindenki)

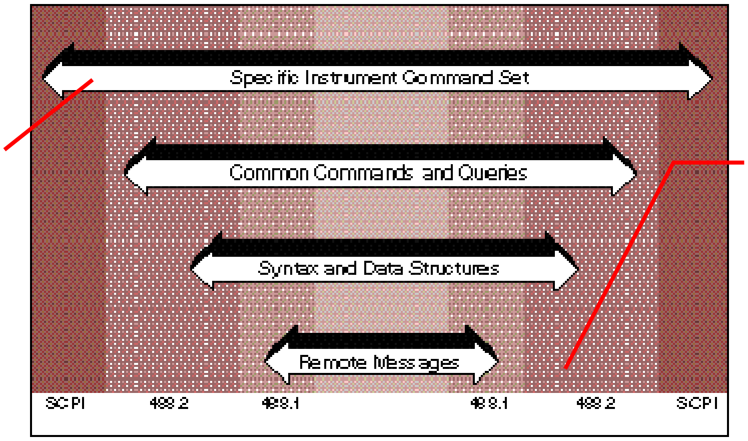


3 wire hardware **HDSK** (handshake) - **T/L** protocol

- **Control** lines: **5** - for general control of instruments and bus activities.
  ATN: Attention, IFC: Interface Clear, REN: Remote Enable, SRQ: Service Request, EOI: End or Identify
- **Ground** lines: **8** - for shielding and signal returns.

IEEE488.2 (+ SCPI [2]) - message exchange: QUERY(?) / RESPONSE(data, status)

műszer
specifikus
parancsok


Specific Instrument Command Set
Common Commands and Queries
Syntax and Data Structures
Remote Messages
SCPI
488.2
488.1
488.1
488.2
SCPI

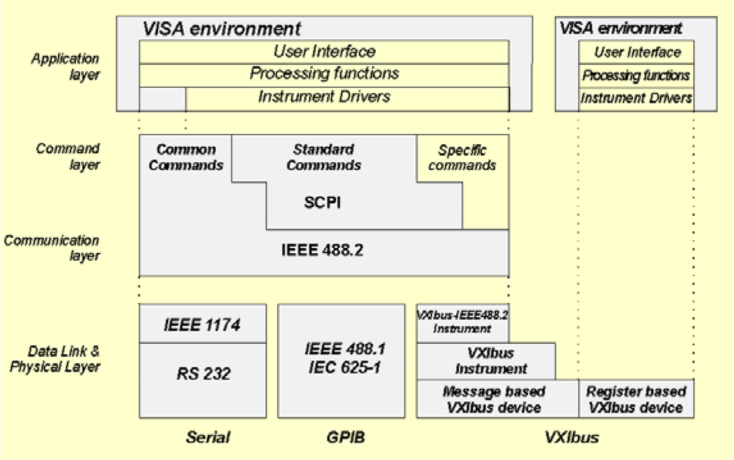
szabványosított
interfész-üzenetek,
vezérlési
szekvenciák, és
adat (és állapot) -
struktúrák

[1] **GPIB** : **G**eneral **P**urpose **I**nterface (Instrument) **B**us

[2] **SCPI** : Standard Commands for Programmable Instruments

ATE (automatic test equipment) standards:

On the lowest level there is the definition of the interface platform itself. This can be the well known **IEEE 488.1/IEC 625-1** interface, commonly called **GPIB (General Purpose Interface Bus)**, but other type of interface media of later date, like **VXI**[3] or **RS 232** with IEEE 1174, can be associated also with this layer. The functionality found in this layer, defines the electrical and mechanical properties of the interface medium and contains protocols for establishing the data path between the controller and the instruments. These lower layer standards do not deal with the contents of the data itself.

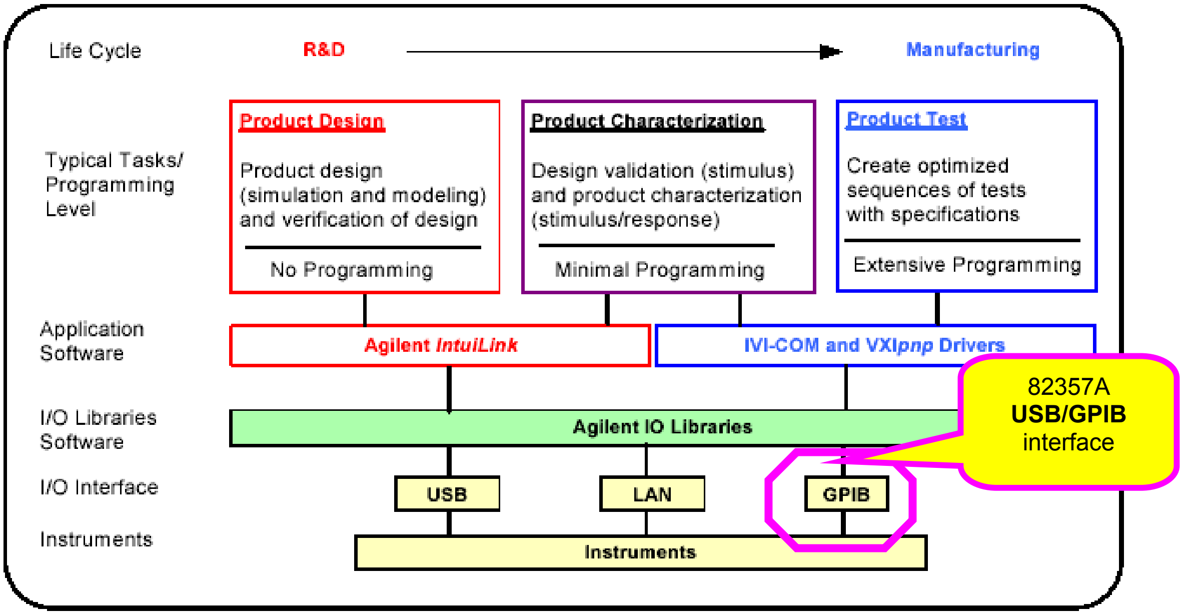


By defining the message syntax (spelling), the **IEEE 488.2** provides a concept that meets the demands for instrumentation systems. But IEEE 488.2 is more than a syntax definition only. It was clearly shown by the experiences of the instrument manufacturers who took the initiative to this standard, that a protocol was needed to guarantee a reliable communication, which would not hang up under any condition. Therefore, the so called Message Exchange Protocol - MEP - was established. This protocol is based on the principle that 'an instrument may not send data until it is asked for'. For that purpose, IEEE 488.2 distinguishes between commands and queries. This concept is anchored in the language construction, since commands and queries follow different syntax's.

The definition of the semantics (meaning) of program messages is *not* part of the IEEE 488.2 standard. This was left to higher level standards like **SCPI**, or to the instrument designer. However, the so called 'common commands' is the exception to this rule.

The main benefit of the **VISA**[4] concept is that it establishes a solid and rigid hard and software environment for virtual instrumentation and allows end users to port their applications among different tools. The VISA I/O drivers access the interface boards regardless their manufacturers.

Agilent **IntuiLink** is typically used for Product Design or Product Characterization:



[3] **VXI** : VMEbus Extension for Instrumentation

[4] **VISA** : **V**irtual **I**nstrumentation **S**oftware **A**rchitecture