


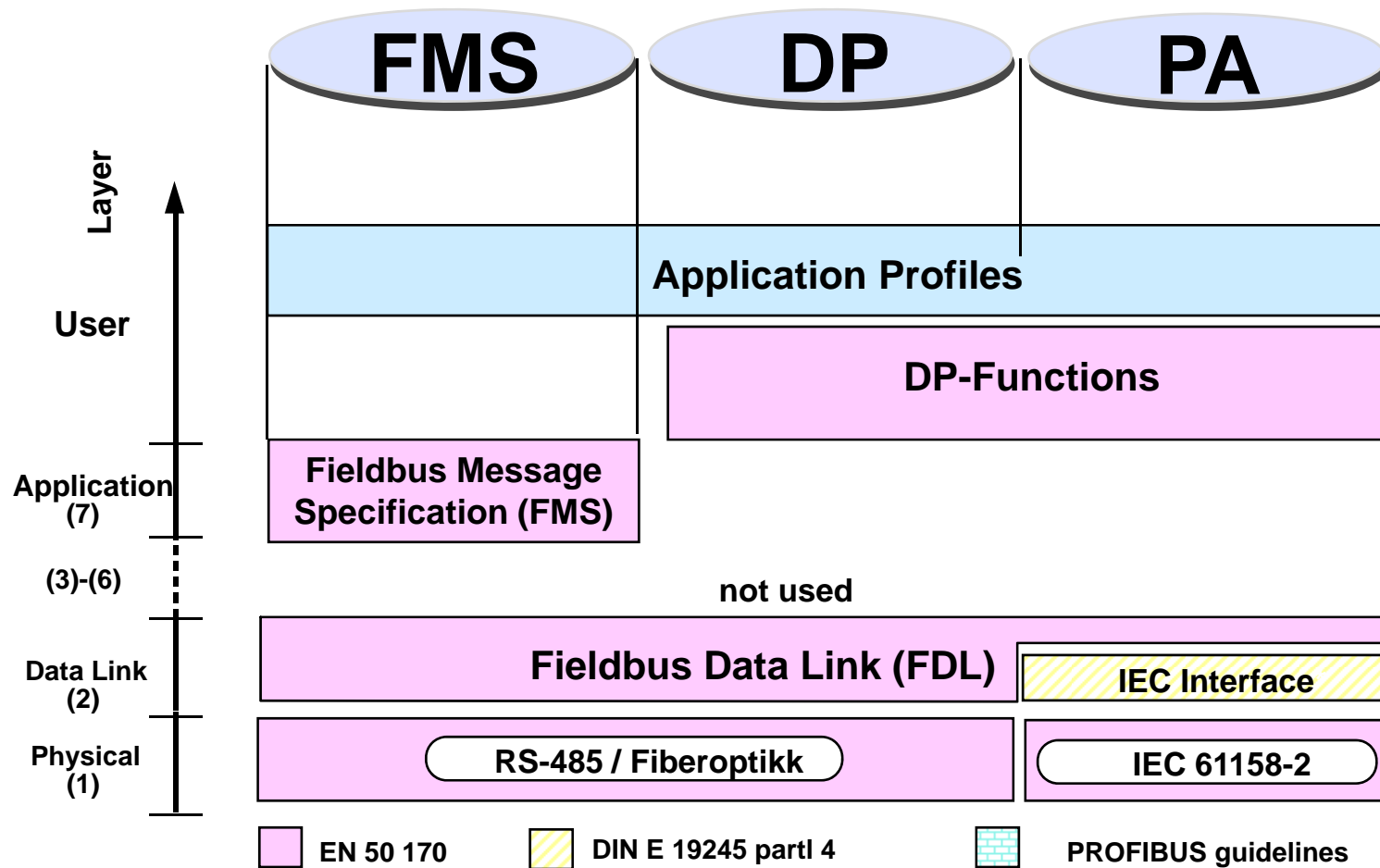


**PROFI**<sup>®</sup> technical  
PROCESS FIELD BUS  
**BUS** basics

- 
- The PROFIBUS protocols**
  - Wiring**
  - Installation, DP- and PA-nodes**
  - Data representation on the bus**
  - Exchange of data, master / slave**
  - Cycle time, DP Mono-master-system**
  - Configuration**
  - GSD : Electronic data sheet**



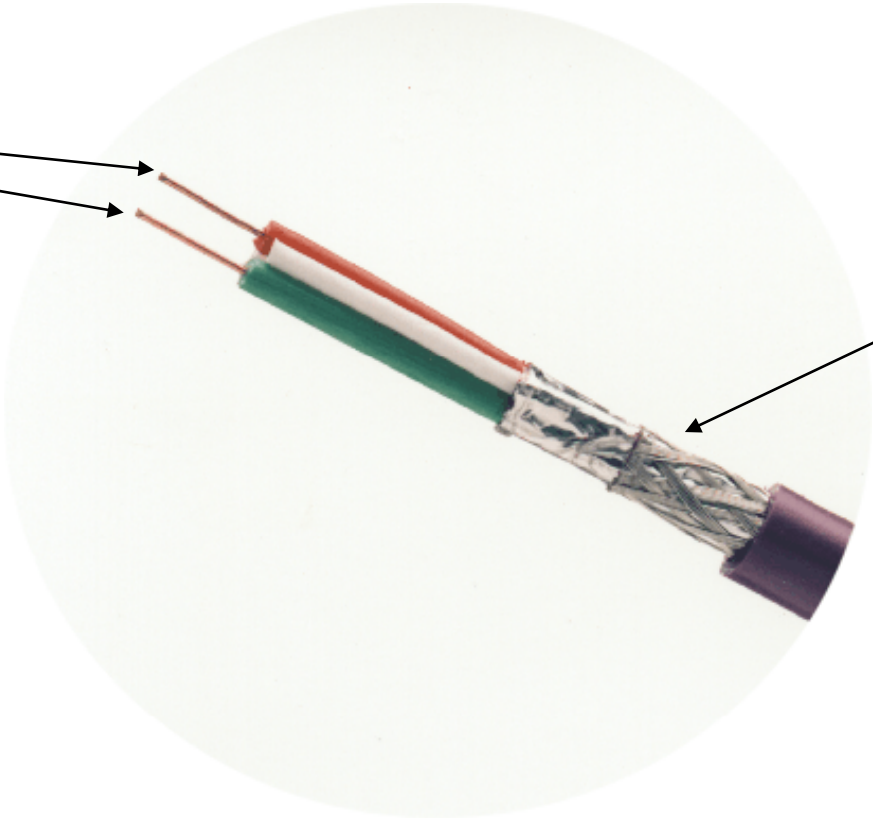
# The PROFIBUS protocols



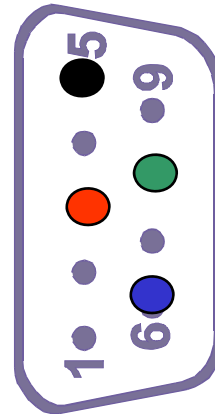
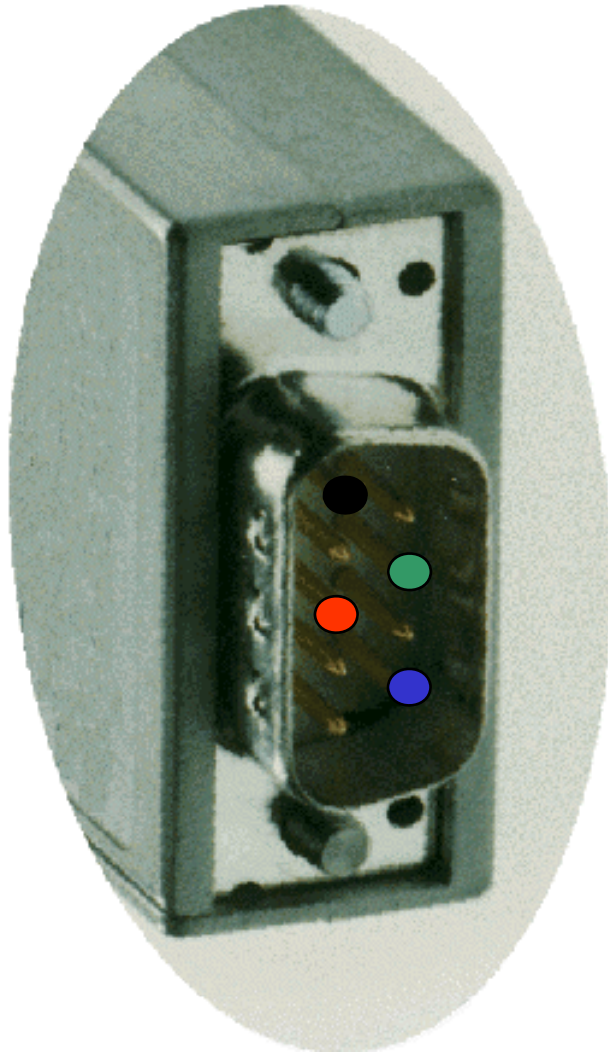
# Wiring

2 wires

shield



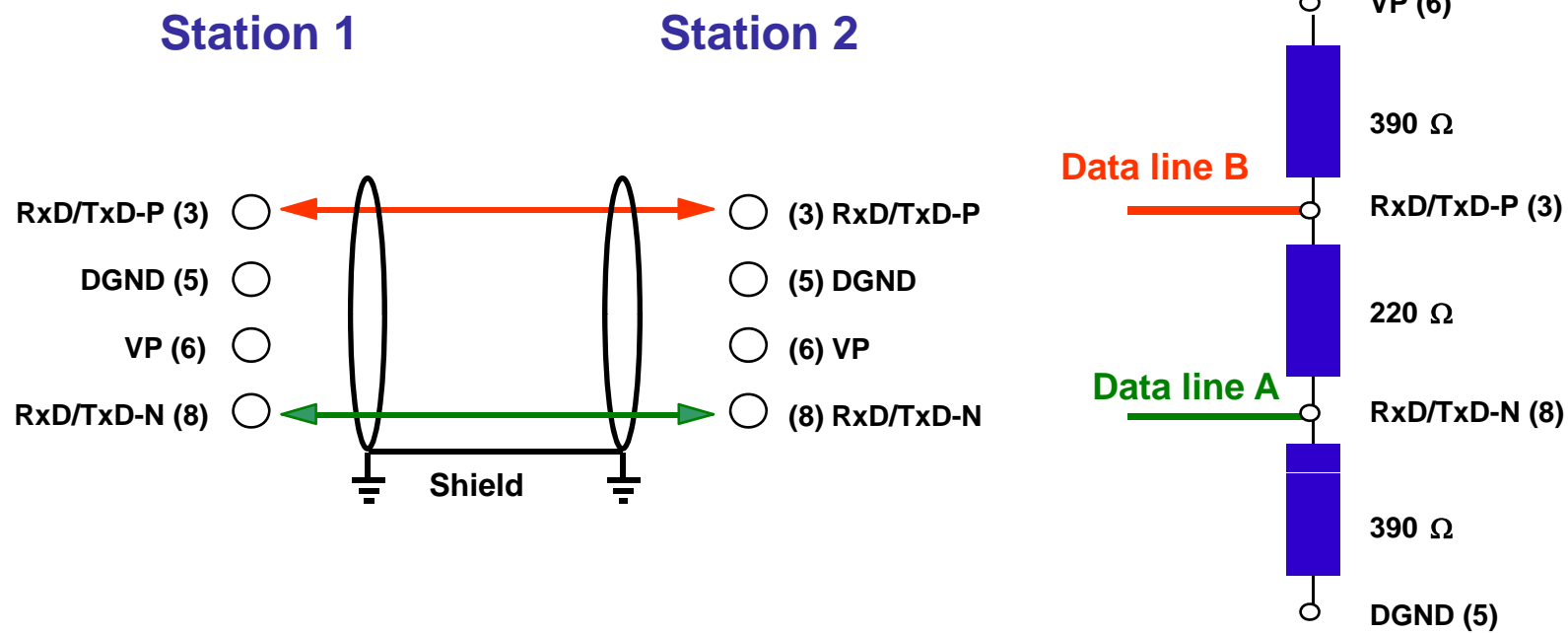
# Pin assignment



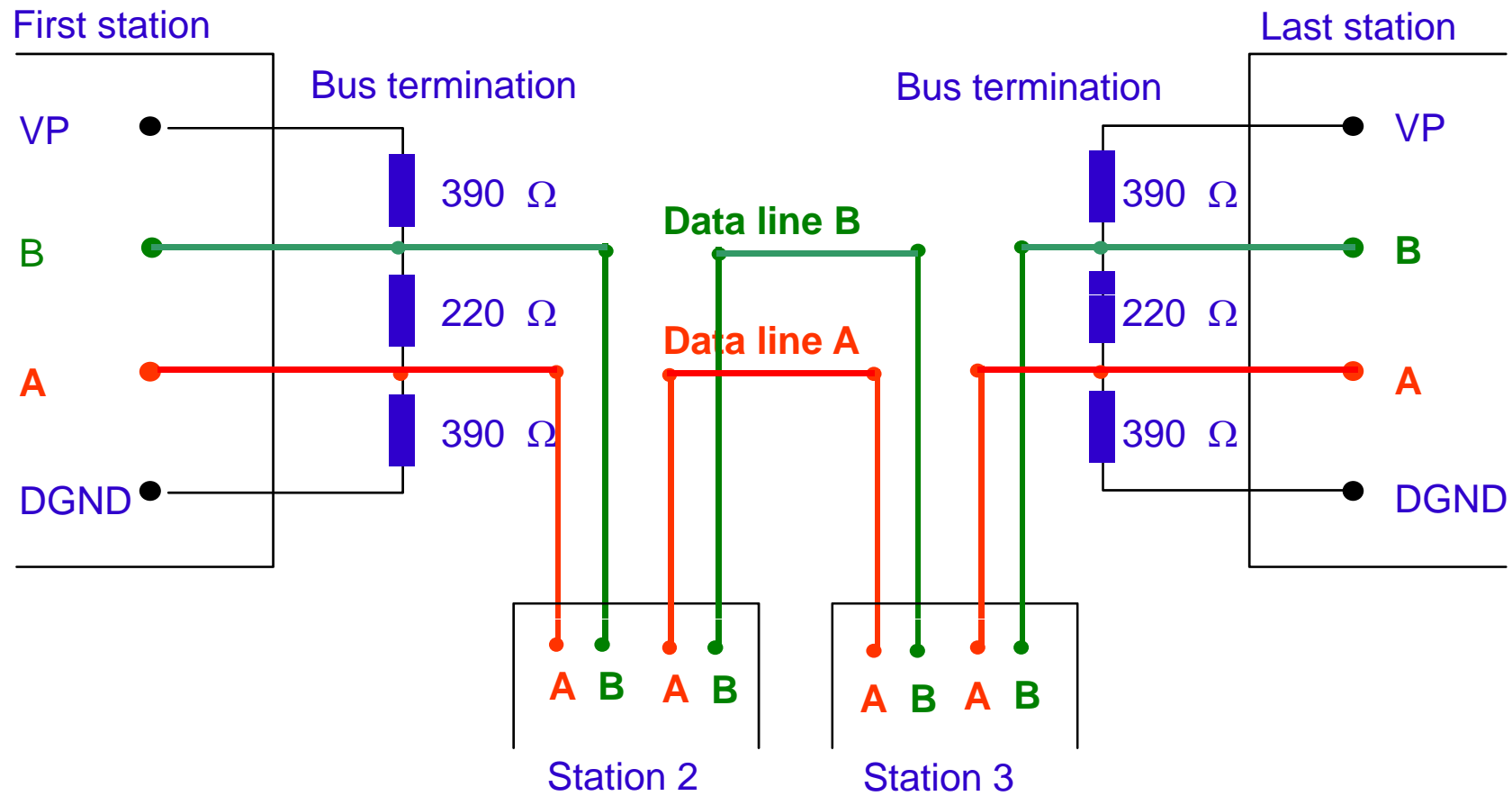
Pin no	Signal	Description
● 3	RxD/TxD-P	Data line B + (red wire)
● 5	DGND	Signal Ground
● 6	VP	Power for termination (P5V)
● 8	RxD/TxD-N	Data line A - (green wire)



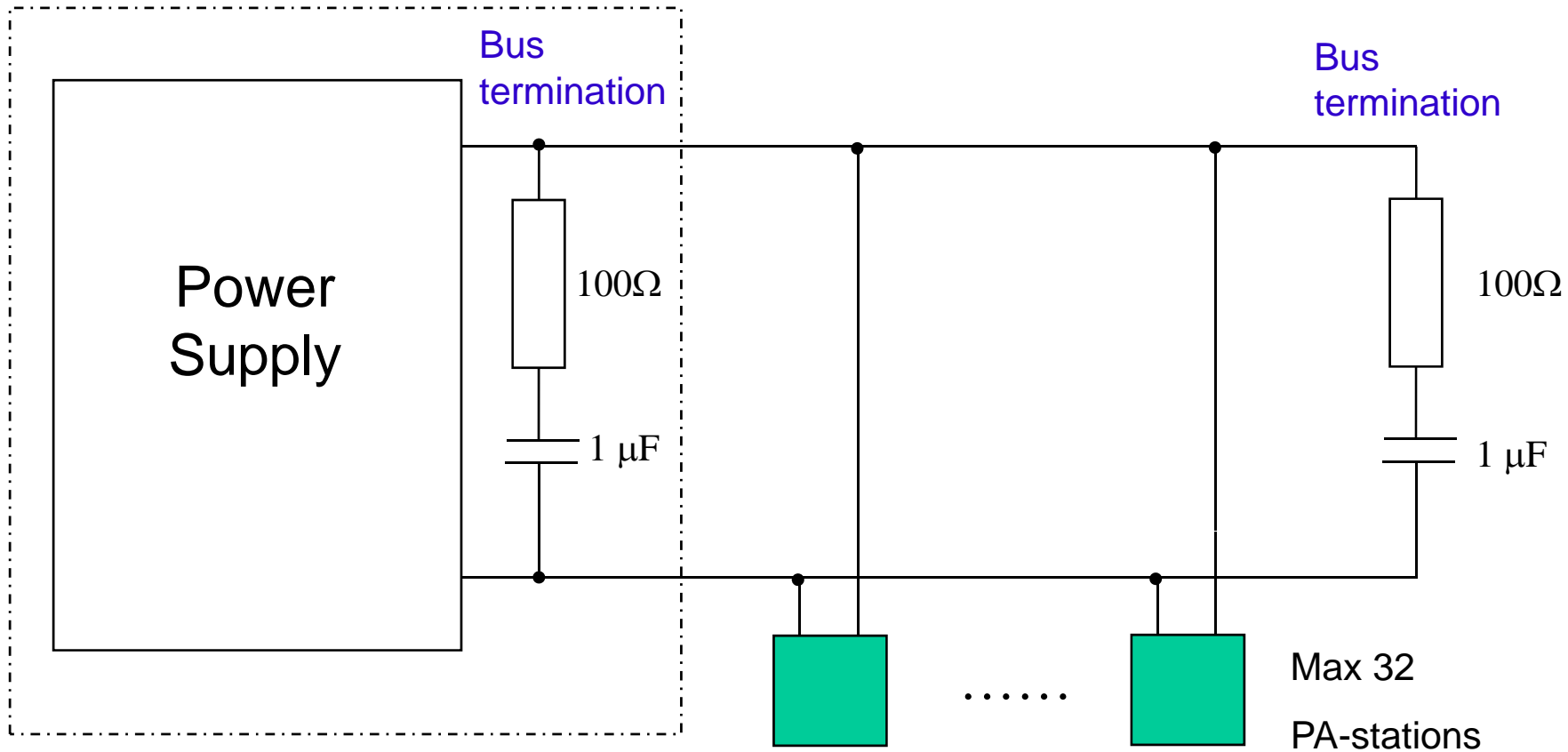
# Termination, RS485

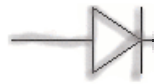


# Installation, DP-nodes



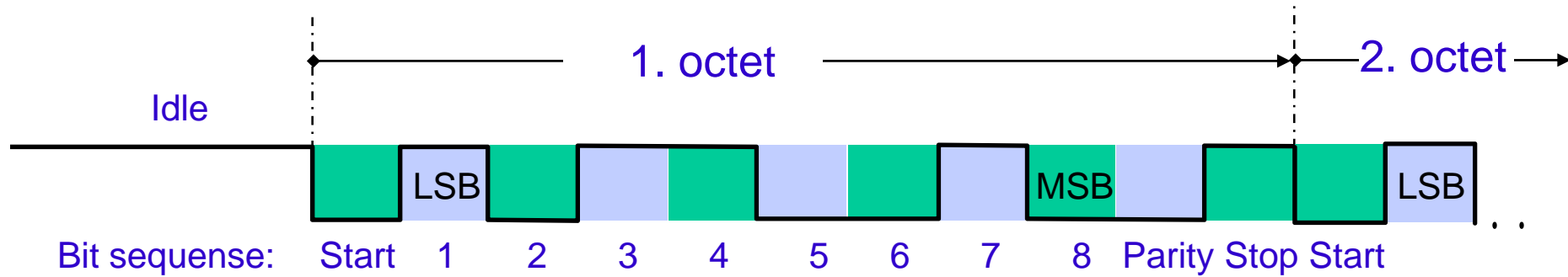
# Installation, PA-nodes





# The smallest data package

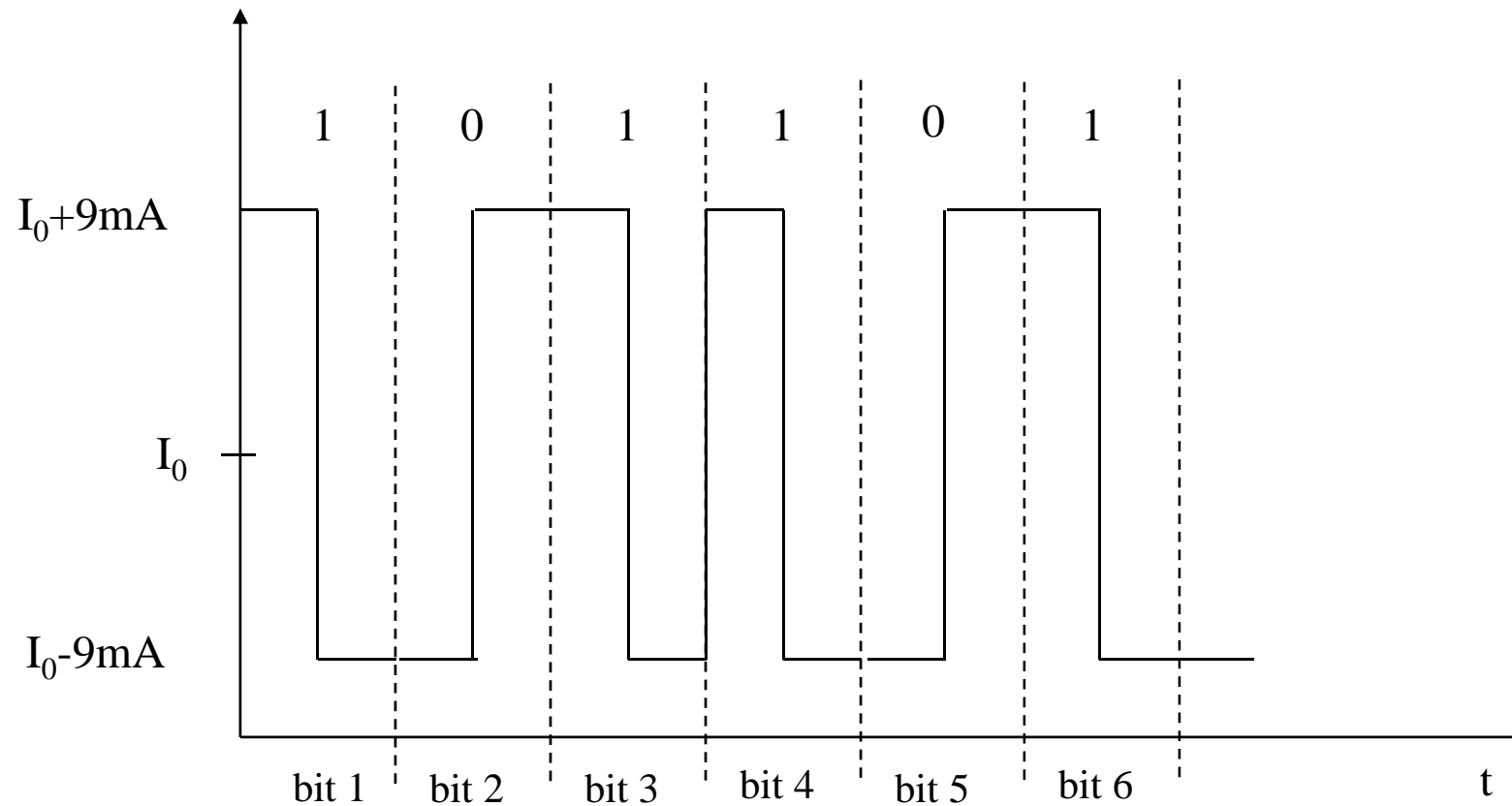
## The OCTET



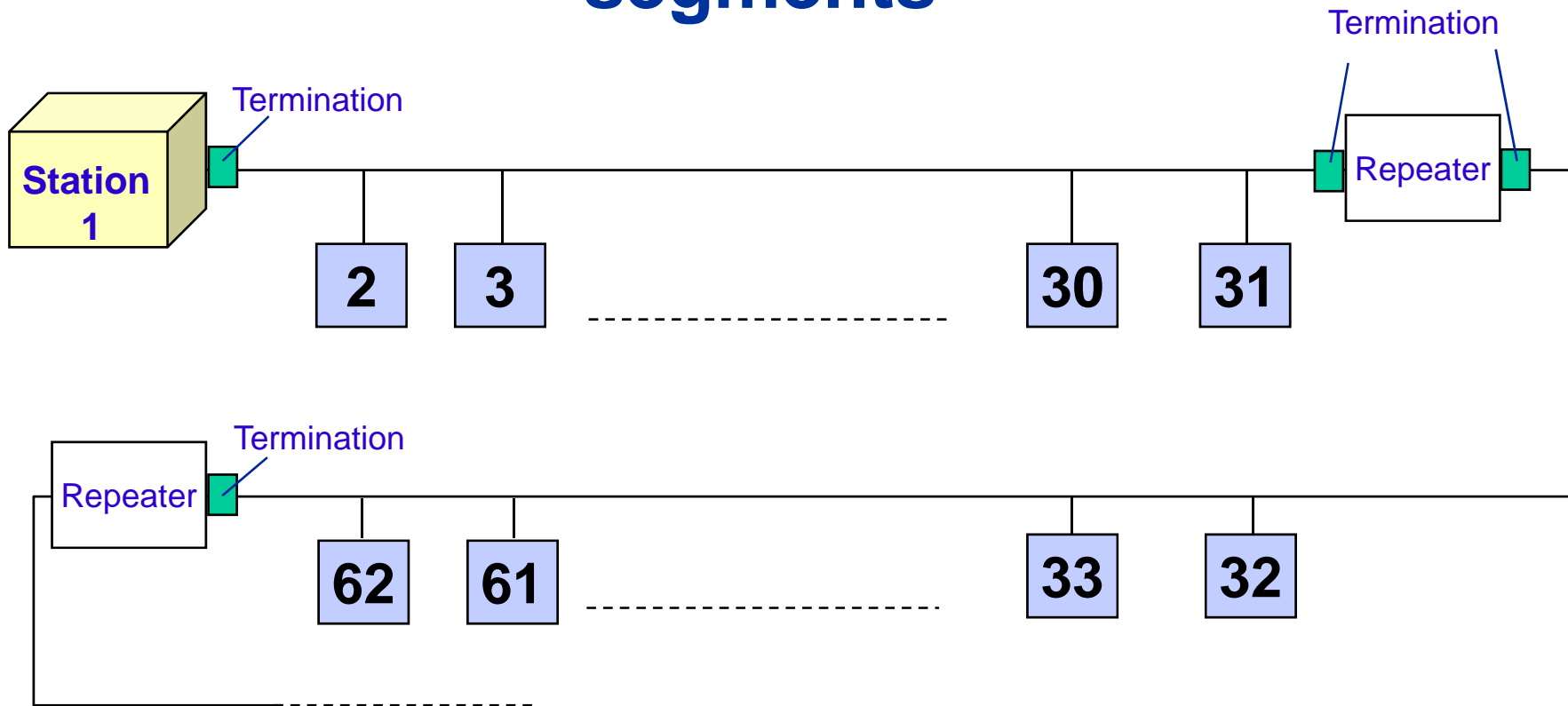




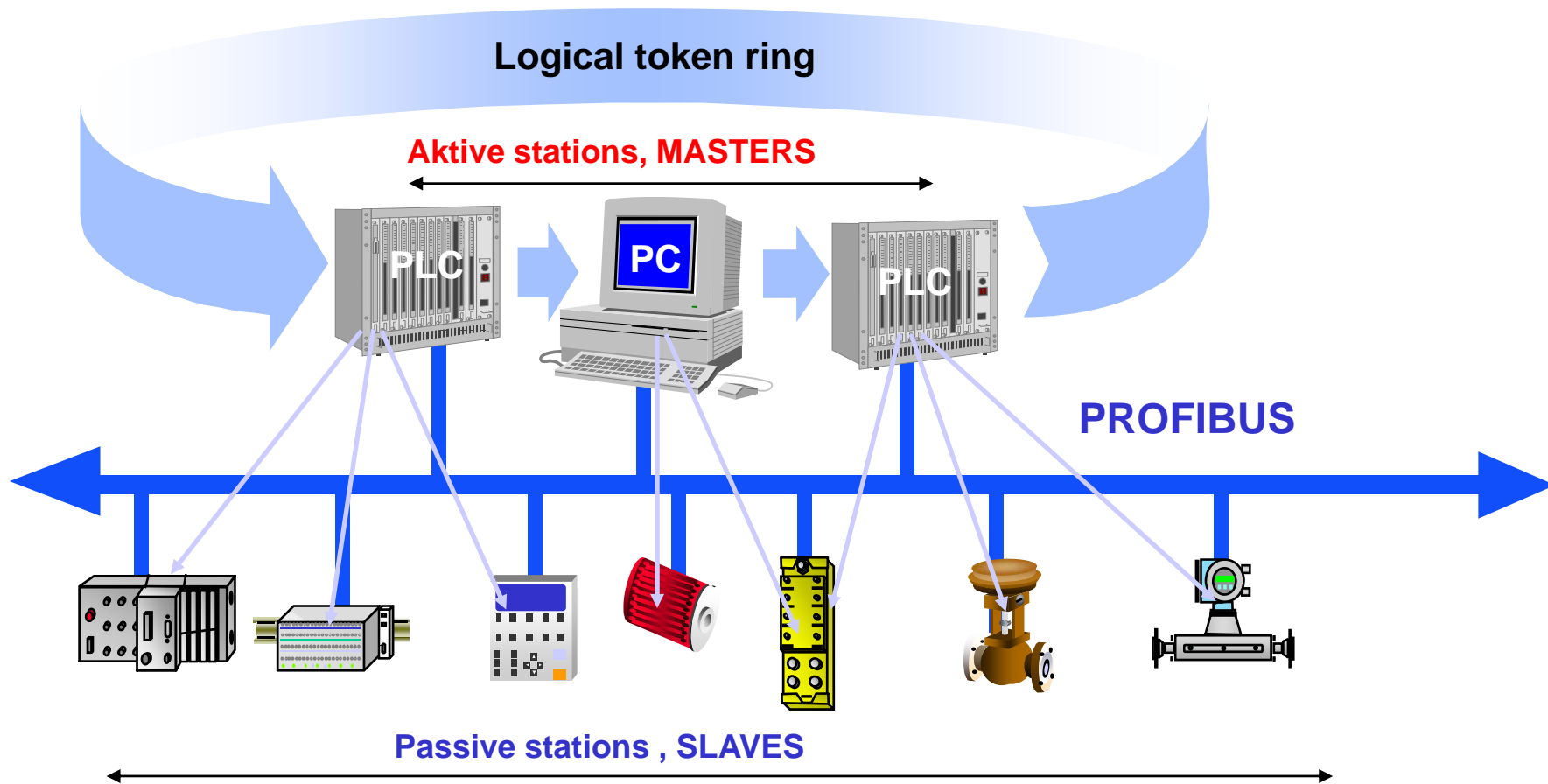
# Data representation IEC – 6 1158-2



# Stations, repeaters and segments



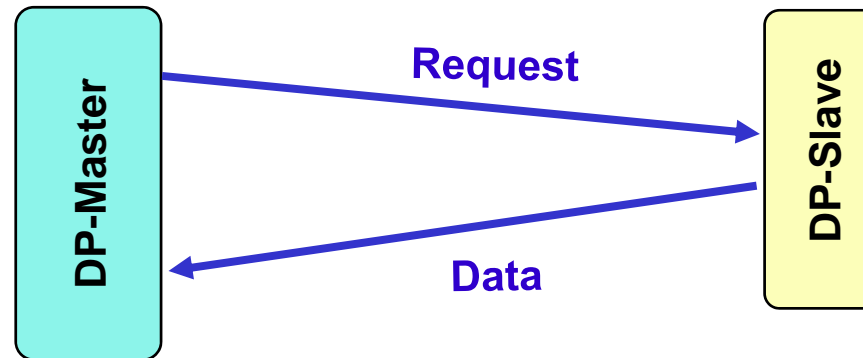
# Token ring



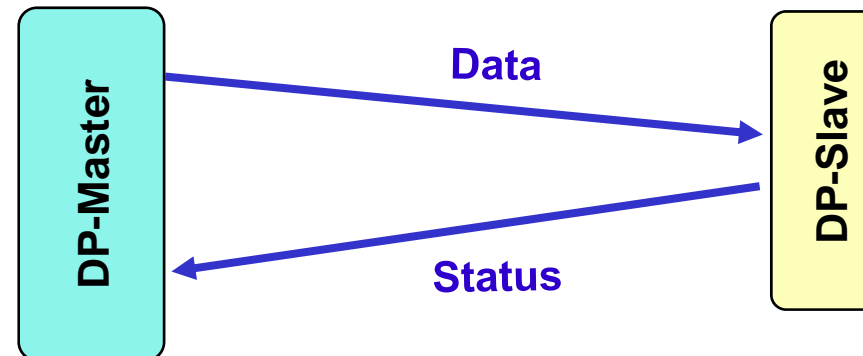
# Exchange of data, master/slave



**Slave → Master**



**Master → Slave**



# The 3 most common PROFIBUS telegrams

## 1.) Token Passing



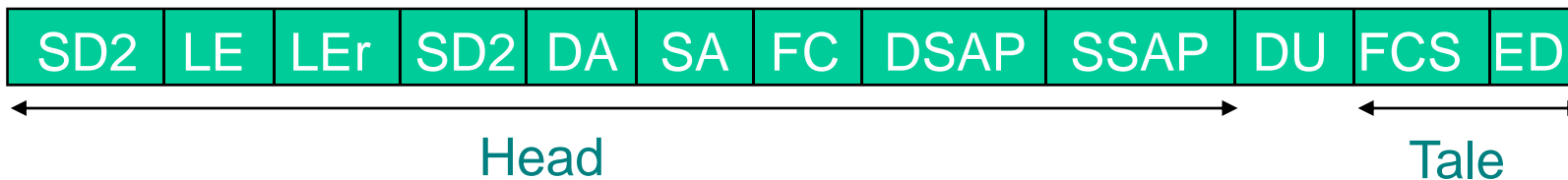
**SDx** = Start Delimiter x  
**DA** = Destination Address  
**SA** = Source Address

## 2.) FDL Status Request Telegram



**FC** = Function Code  
**FCS** = Frame Check Sequence  
**ED** = End Delimiter

## 3.) Data Telegram



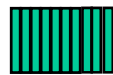
**LE** = Length  
**LEr** = Repeated Length  
**DSAP** = Destination Service Access Point  
**SSAP** = Source Service Access Point  
**DU** = Data Unit



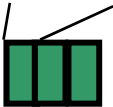
## Data transmission at 1.5 MBaud



Tbit = transmission time, 1 bit =  $0.6667\mu\text{s}$



OCTET : 11 Tbit =  $7.3\mu\text{s}$



**Token Passing** : 33 Tbit = 22  $\mu\text{s}$



**Status / Request** : 66 Tbit = 44  $\mu\text{s}$



**Data** : Head (9 octets) + Tale (2 octets) + Data (n octets)

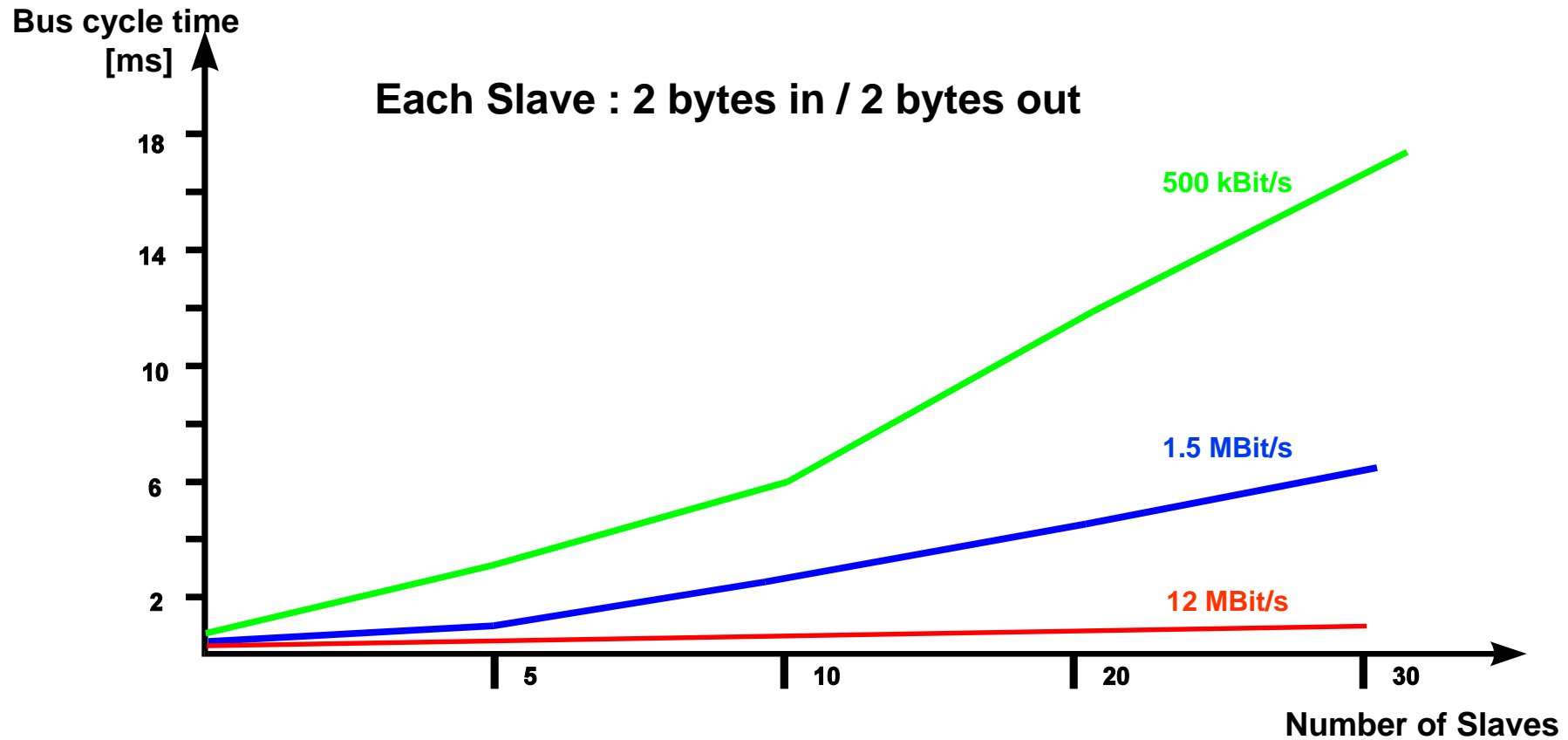
2 bytes of data :  $13 \times 11 \text{ Tbit} = \underline{143 \text{ Tbit} = 95.3\mu\text{s}}$

- ✦ "Idle time" for master : typical 75 Tbit = 50  $\mu\text{s}$
- ✦ "Station delay time" for slave : typical 11 Tbit = 7.3  $\mu\text{s}$

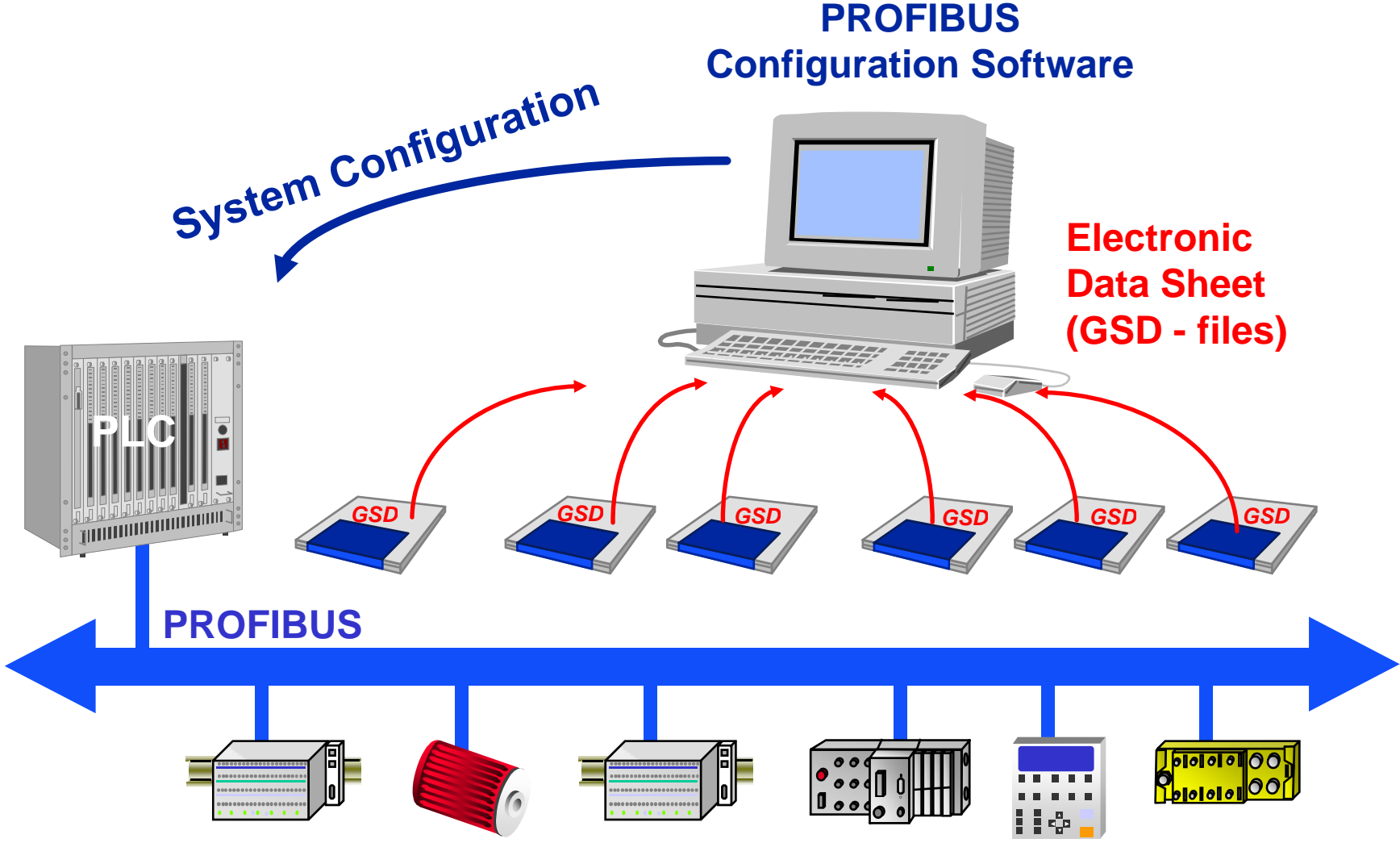
➔ **Total, 2 bytes of data** :  $(33+66+143+75+11)\text{Tbit} = \underline{0.219 \text{ ms}}$



# Cycle time, DP Mono-master-system



# Configuration







# GSD-file (WINblock station)



```
; WIWB0250.GSD
; Geraetestammdatei fuer PROFIBUS DP WINbloc 8 DI P
; Art.No. 827516
; Weidmueller GmbH + Co, Postfach 2807, 33058Paderborn
; Serviceline 05252 960-555, Fax 05252 960116
; Mailbox GSD, Siemens Typdateien: 05231 141555
; Name:Gast kein Password ;
; Version: 1.6      Stand: 10.6.97 Km
;=====
;
#Profibus_DP
GSD_Revision      = 1
Vendor_Name       = "Weidmueller Interface"
Model_Name        = "WINbloc 8DI"
Revision          = "V1.6"
Ident_Number      = 0x250
;
```





## GSD-file cont.

```
Protocol_Ident      = 0
Station_Type       - 0
FMS_supp           = 0
Hardware_Release   = "Ver.4"
Software_Release   = "00"
;
9.6_supp           = 1
19.2_supp          = 1
O.s.v
12M_supp           = 1
;
MaxTsdr_9.6        = 60
MaxTsdr_19.2       = 60
O.s.v
MaxTsdr_12M        = 800
;
Redundancy          = 0
Repeater_Ctrl_Sig  = 2
24V_Pins            = 0
;
Implementation_Type = "LSPM2"
Bitmap_Device       = "winblocln"
Bitmap_Diag         = "winblocls"
;
```





## GSD-file cont.



```
; Slavespezifische Werte
;
OrderNumber      = "827516"
Periphery        = "WINbloc"
Freeze_Mode_supp = 1
Sync_Mode_supp   = 1
Auto_Baud_supp   = 1
Set_Slave_Add_supp = 0
Min_Slave_Intervall = 1
Modular_Station  = 0
Modul_Offset     = 0
Fail_Safe        = 0
Slave_Family     = 3@TdF@WINbloc
;
Max_Diag_Data_Len = 13
User_Prm_Data_Len = 0x05
User_Prm_Data     = 0x00,0x00,0x00,0x00,0x00
Module           = "DP-Kompaktgeraet 8 I" 0x00,0x10
EndModule
```