

Osnove mikroprocesorske elektronike

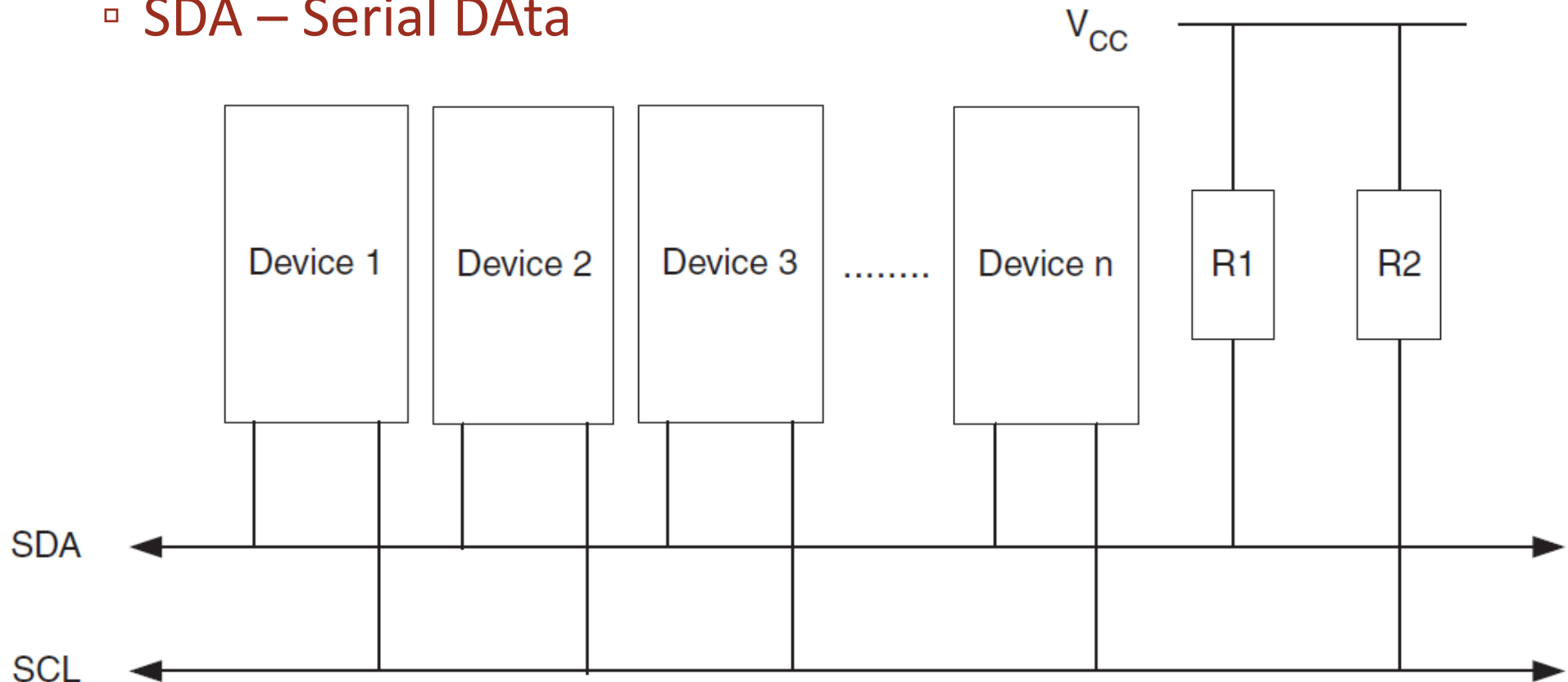
Marko Jankovec

Sinhrona komunikacijska vodila

IIC oz. I²C

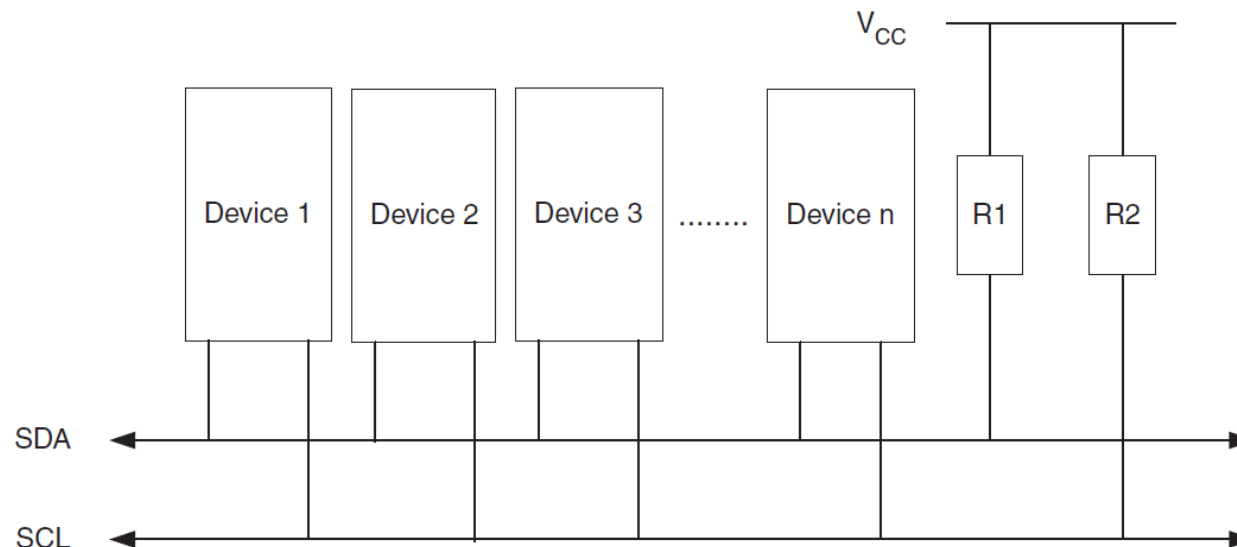
Vodilo IIC (Inter Integrated Circuit) – I²C

- Sinhrono vodilo
 - SCL – Serial CLock
 - SDA – Serial DAta

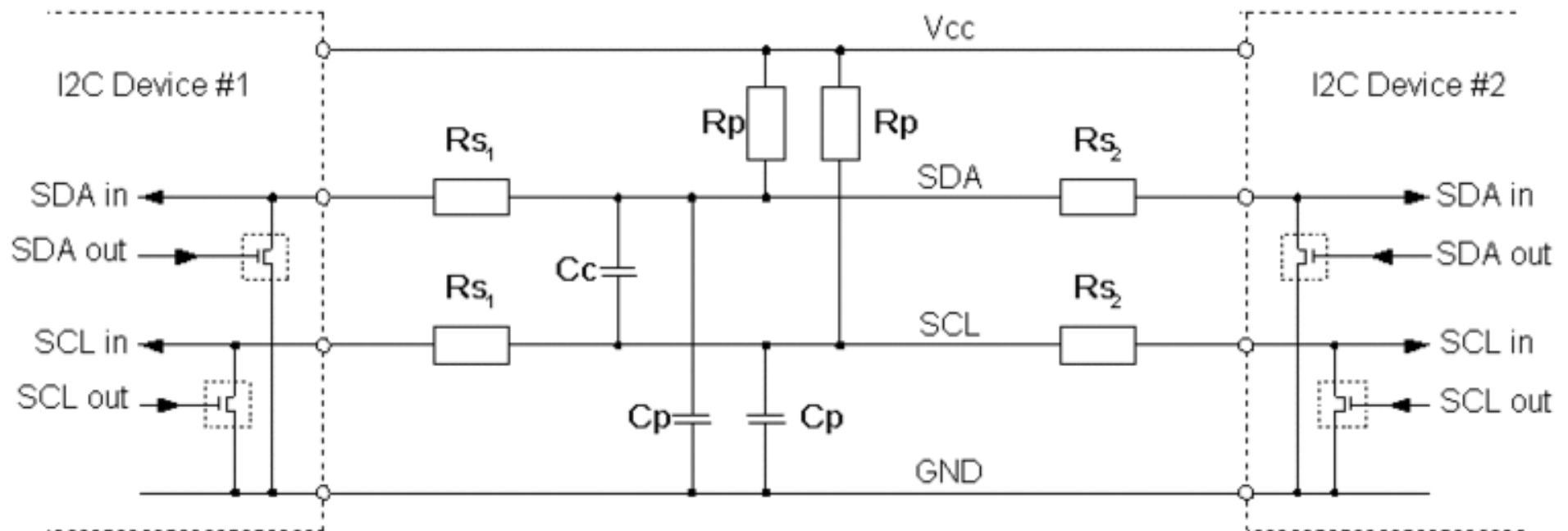


Terminologija

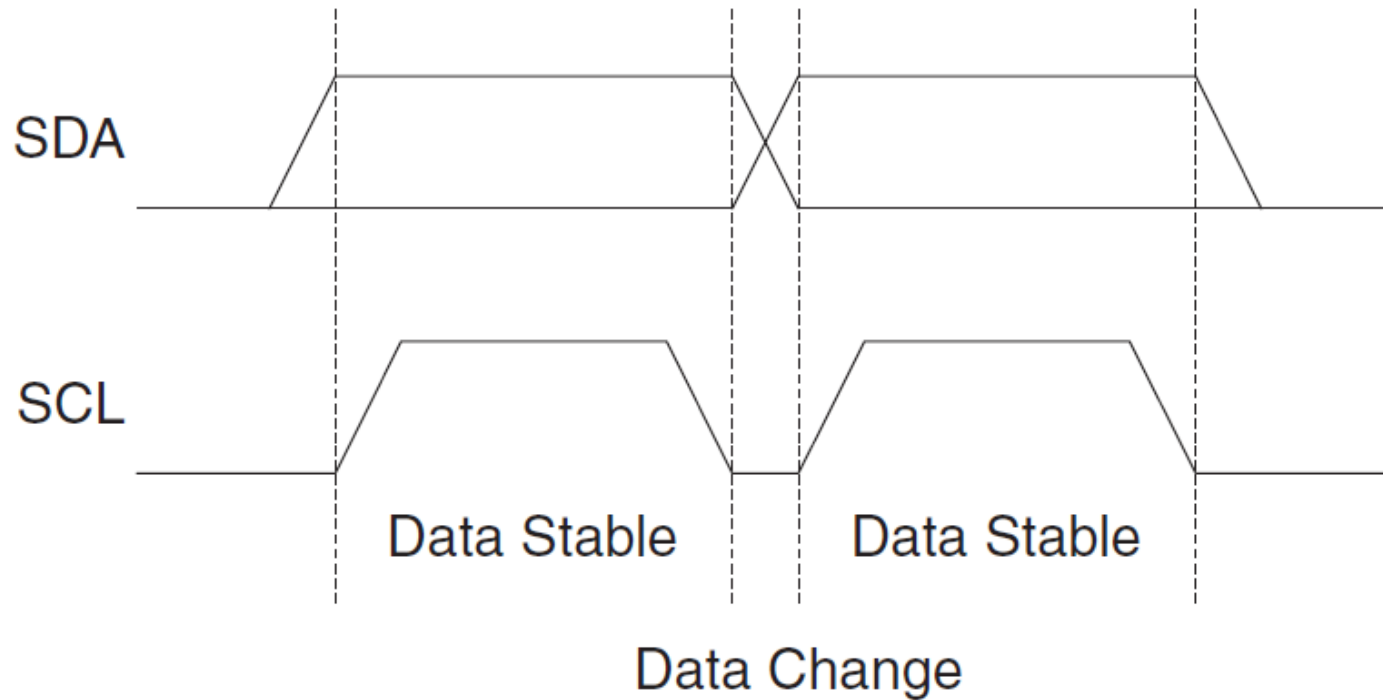
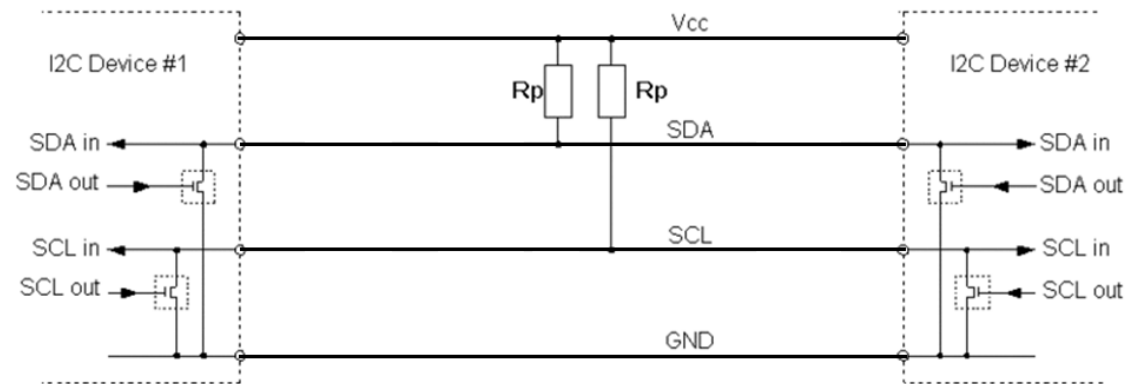
| Termin | Opis |
|------------------------|---|
| Gospodar (master) | Naprava, ki sproži oz. ustavi prenos podatkov. Generira tudi uro SCL. |
| Suženj (slave) | Naprava, ki ji naslovi gospodar. |
| Oddajnik (transmitter) | Naprava, ki daje podatke na vodilo. |
| Sprejemnik (receiver) | Naprava, ki bere podatke z vodila. |



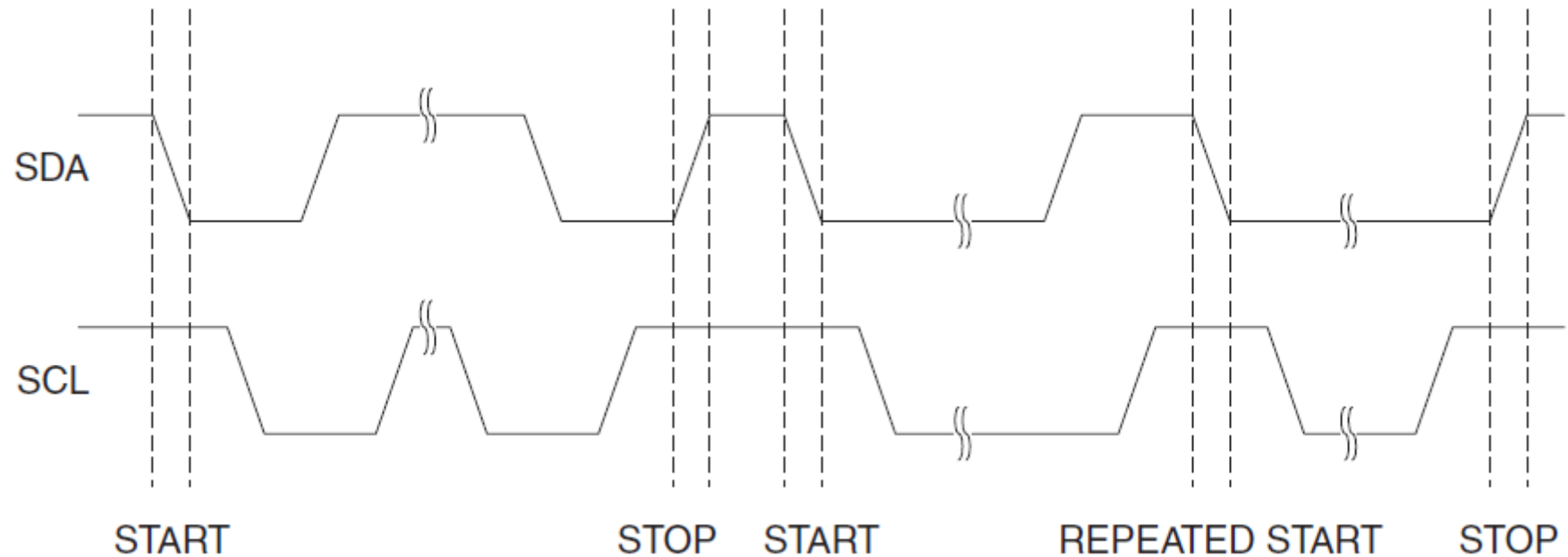
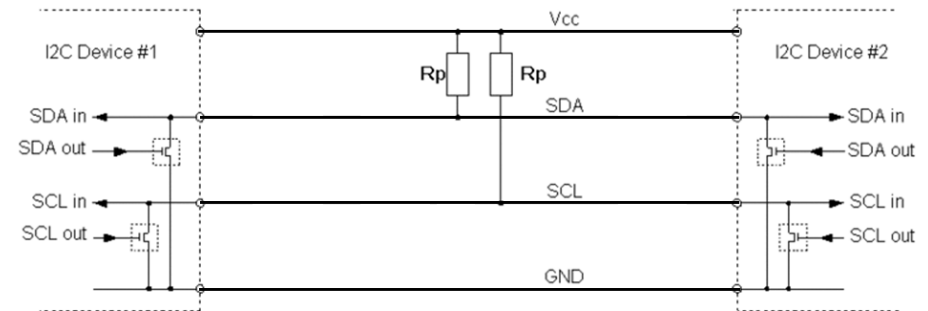
Električna shema vodila I²C



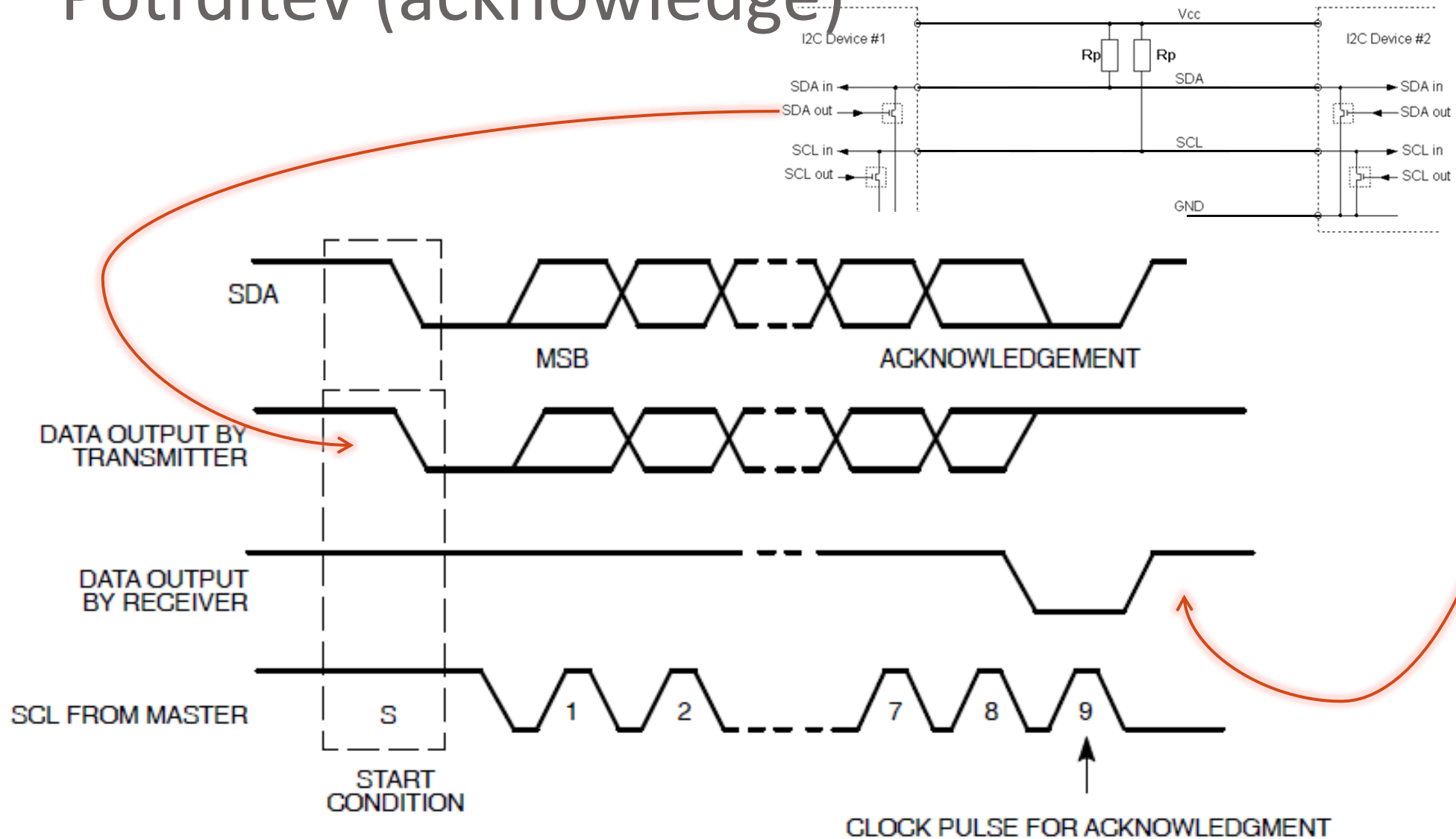
Signali vodila I²C



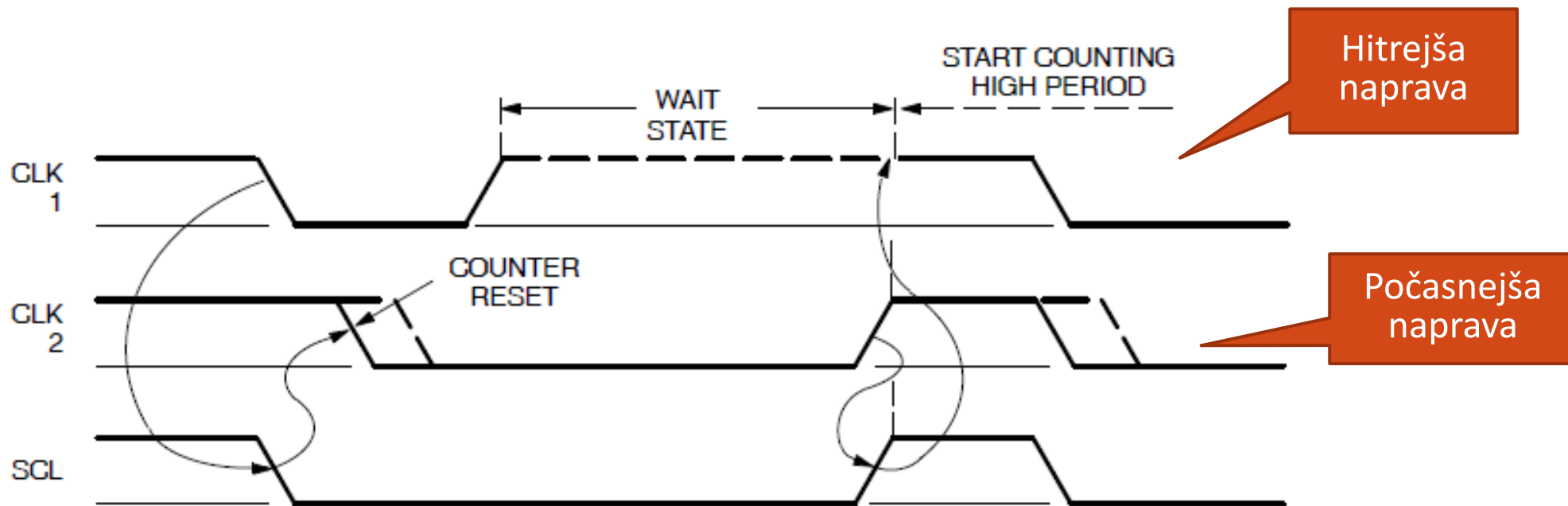
START in STOP



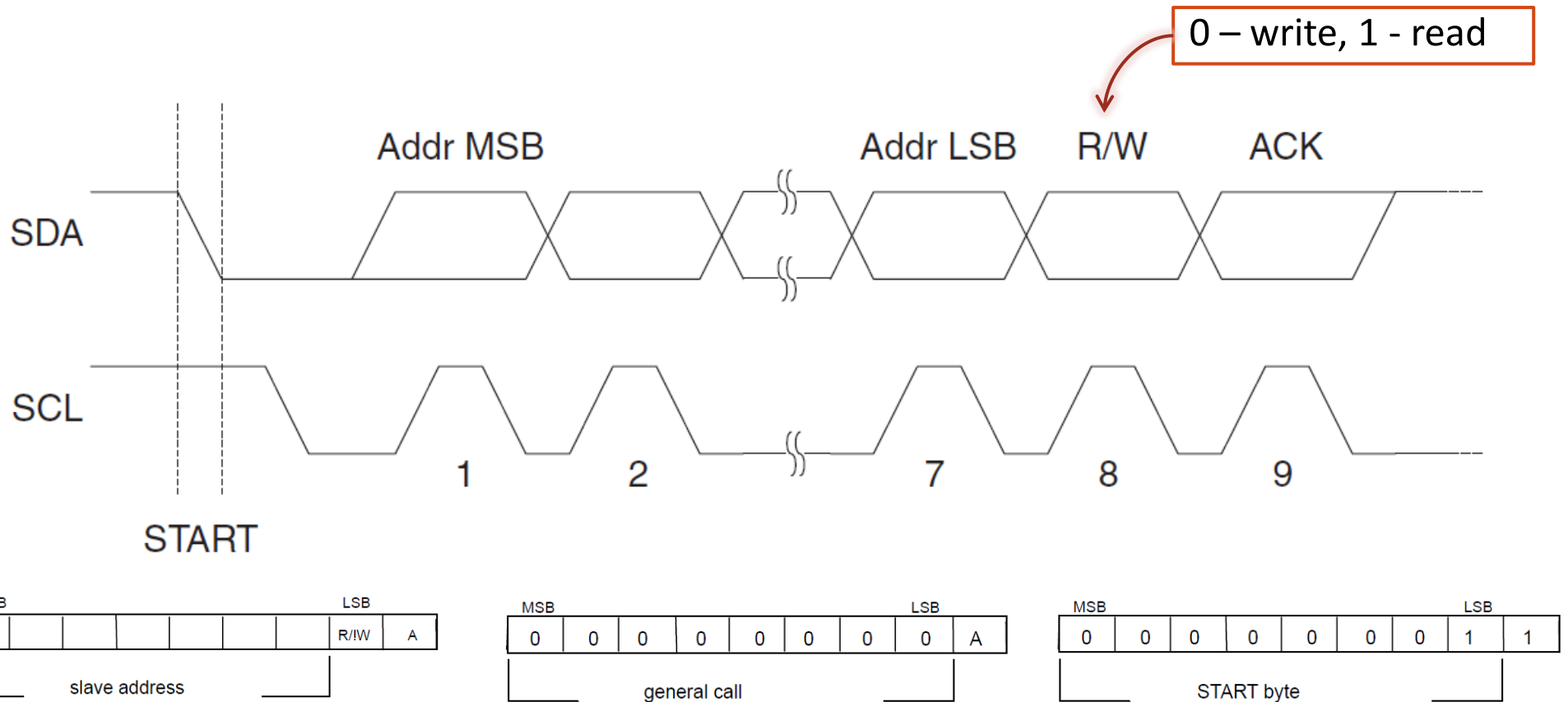
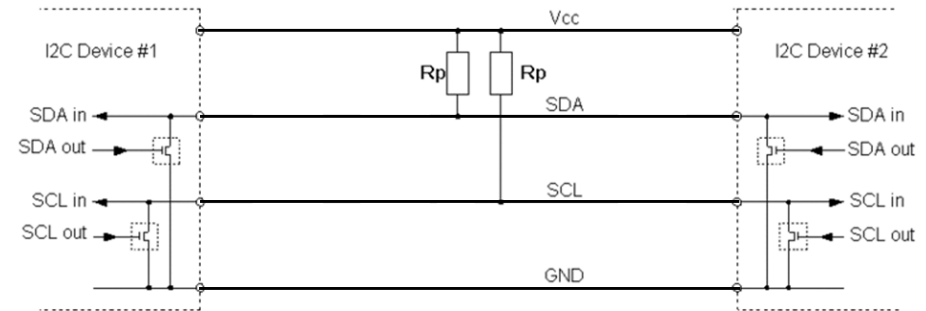
Potrđitev (acknowledge)



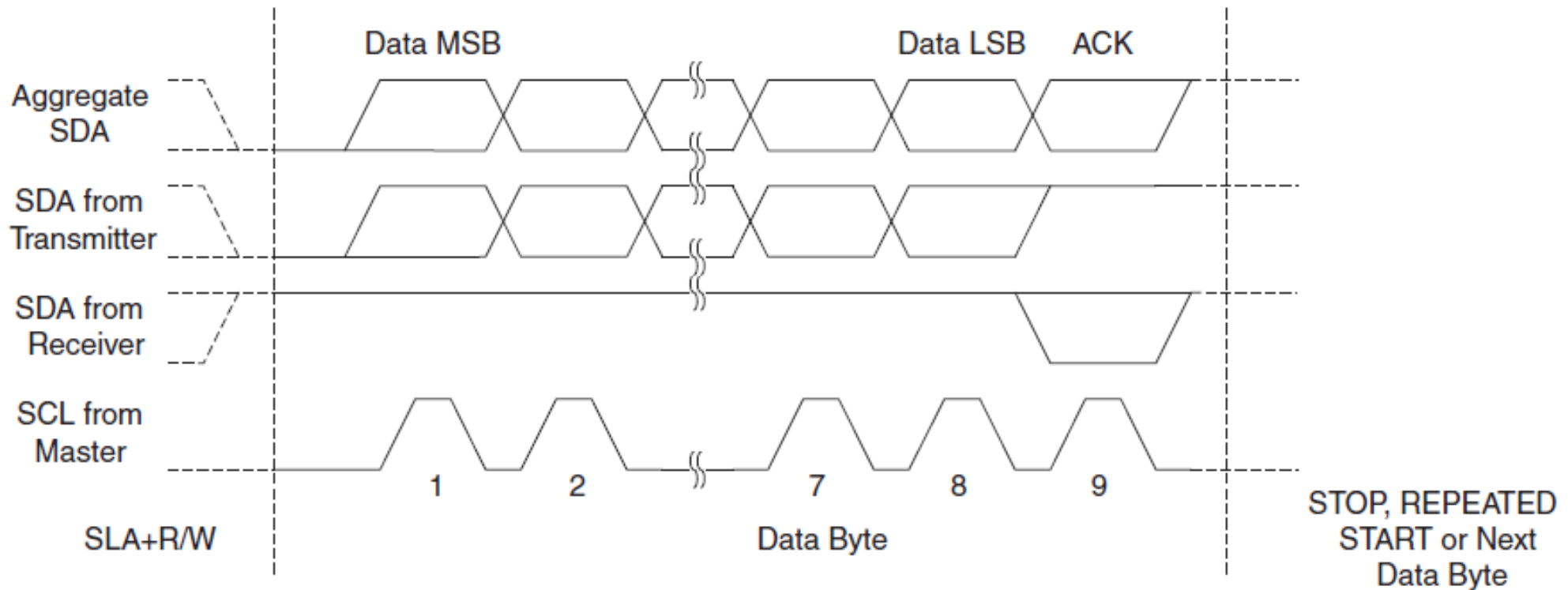
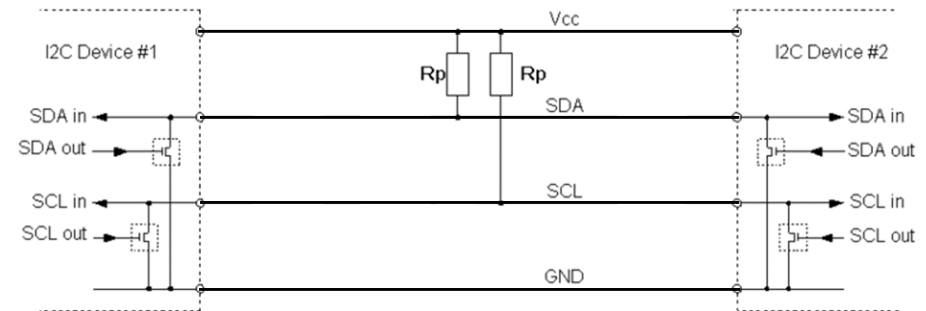
Sinhronizacija ure



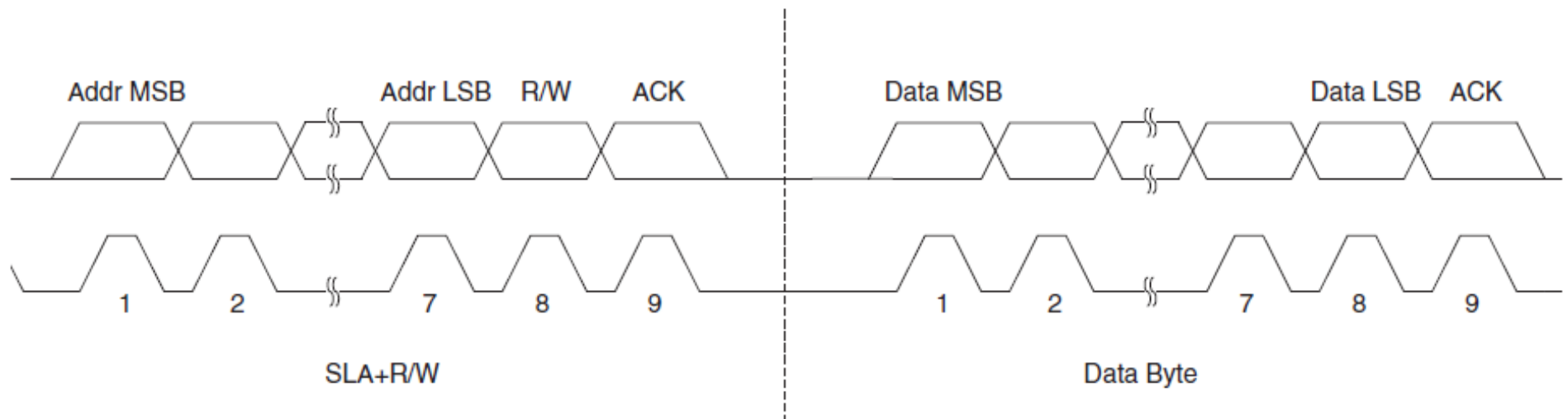
Format prenosa naslova naprave



Format prenosa podatka napravi

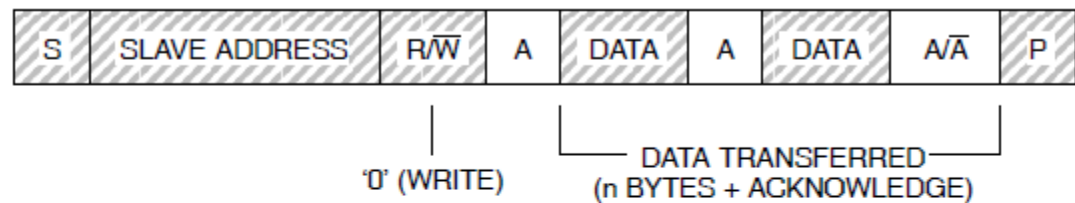


Tipičen prenos podatka naslovljeni napravi



Pisanje/branje na/iz I²C kot gospodar

- Master transmitter

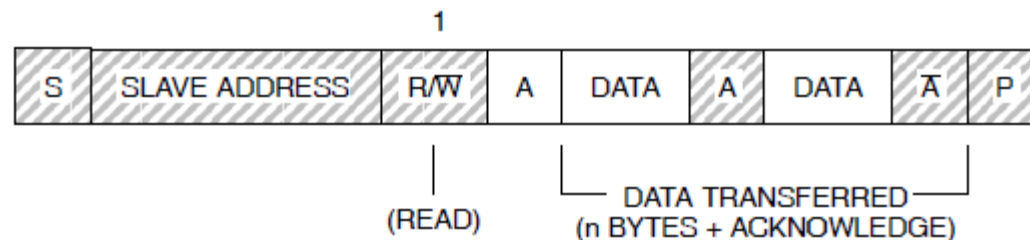


FROM MASTER TO SLAVE

FROM SLAVE TO MASTER

A = ACKNOWLEDGE (SDA LOW)
Ā = NOT ACKNOWLEDGE (SDA HIGH)
S = START CONDITION
P = STOP CONDITION

- Master read



Lastnosti komunikacije I²C

- Hitrosti
 - Standard
 - do 100 kbit/s
 - Fast mode
 - 400 kbit/s
 - Fast mode plus
 - do 1 Mbit/s
 - High speed
 - 3.4 mbit/s
- Določanje naslova naprave
 - Fiksen naslov
 - Določen digitalno z nekaj zunanjimi pini
 - Določen z zunanjim uporovnim delilnikom (noter AD pretvornik)
- Število naprav oz. dolžina vodila
 - maksimalna kapacitivnost kabla 400 pF za Fast mode
- Logični nivoji
 - Visok nivo: (min 3V ali $0,7 V_{DD}$)
 - Nizek nivo: (maks 1.5 V ali $0,3 V_{DD}$)