**Data Transmission scheme on the same pipe line**

* Transmission from: 1🡪2,3 | 2🡪 1,3 | 3 🡪 1,2

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Node | **1**– 1 = 0 | **# of nodes – 1=** 2 | |  | **# of nodes – 1=** 2 | |  | **# of nodes – 1=** 2 | |
| **1** | S | R | R | S | R | R | S | R | R |
|  | **2** – 1 = 1 |  | **# of nodes – 1=** 2 | |  | **# of nodes – 1=** 2 | |  |  |
| **2** | R | S | R | R | S | R | R | S | R |
|  | **3** – 1 = 2 | |  | **# of nodes – 1=** 2 | |  | **# of nodes – 1=** 2 | |  |
| **3** | R | R | S | R | R | S | R | R | S |

* Transmission from: 1🡪2,3,4 | 2🡪 1,3,4 | 3 🡪 1,2,4 | 4 🡪 1,2,3

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Node | **1**– 1 = 0 | **# of nodes – 1=** 3 | | |  | **# of nodes – 1=** 3 | | |  |
| **1** | S | R | R | R | S | R | R | R | S |
|  | **2** – 1 = 1 |  | **# of nodes – 1=** 3 | | |  | **# of nodes – 1=** 3 | | |
| **2** | R | S | R | R | R | S | R | R | R |
|  | **3** – 1 = 2 | |  | **# of nodes – 1=** 3 | | |  | **# of nodes – 1=** 3 | |
| **3** | R | R | S | R | R | R | S | R | R |
|  | **4** – 1 = 3 | | |  | **# of nodes – 1=** 3 | | |  |  |
| **4** | R | R | R | S | R | R | R | S | R |

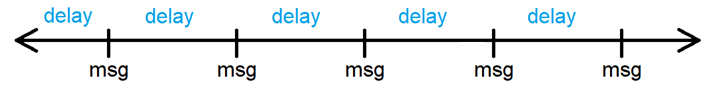
From the above tables we can deduct that for any running node n (where n is the no./address of the node) communication will be as follows:

1. First time: each node will receive **n – 1** times.
2. After receiving for the first time, each node will send once.
3. After Sending for the rest of times each node will receive **# of nodes – 1** times.

N.B: The leader node follows the same algorithm, however n – 1 = 1 – 1 = 0, therefore it won’t receive the first time.

Important notes:

* For the data to be fully sent a delay must be selected between each the sending or receiving of each message (especially if you are sending a large amount of data such as struct)
* This delay must be adjusted for each different message data type and for the different number of communicating nodes.
* One pipeline/address can be maximum used to receive from six modules. ([Source](•%09https:/howtomechatronics.com/tutorials/arduino/how-to-build-an-arduino-wireless-network-with-multiple-nrf24l01-modules/): [Img](https://howtomechatronics.com/wp-content/uploads/2018/07/NRF24L01-can-listen-up-to-6-other-modules-at-the-same-time.png))
* A sending cycle **S** or a receiving cycle **R** can be as follows:



During **S:** msg corresponds to a message being sent.

During **R:** msg corresponds to a message being received.