# Device Monitor

The solution is to create a class whose instance monitors the input port. Since the messages are supposed to come from different devices, it is assumed it will be on a TCP/IP channel.

Single devices send messages in a specified format to the input port. The instance reads messages from the port, parses them (device, measured value) and stores them in a collection.

The instance provides information -

* Count of received messages from individual devices
* Total number of received messages

Instance allows –

* The start of the receiving messages
* The stop of the receiving messages

## Communication protocol (received messages)

|  |  |  |  |
| --- | --- | --- | --- |
| Message index | Device ID (little endian) | Measured value (litle endian) | End of message |
| 1 byte | 4 bytes | 4 bytes | 7 bytes |

**Index zprávy** – used to distinguish whether it is a new message or a repetition of the message when the ACK is lost. If the index is the same as the index of the previous message, it is a repetition of the message.

**Device ID** – device identifier in little endian format.

**Measured value** – measured value in little endian format.

**End of message** - a group of seven bytes that indicate the end of a message. (converted to string: "<|EOM|>")

**ACK** – confirmation of message receipt has 12 bytes (Message index + Device ID + ACK). ACK is represented by seven characters (converted to string: "<|ACK|>").

|  |  |  |
| --- | --- | --- |
| Message index | Device ID (little endian) | ACK |
| 1 byte | 4 bytes | 7 bytes |

NOTE

In fact, the protocol is given by the device protocol. In certain cases, devices may use different protocols. This is not considered in this case.

## Control

### Creating an instance - constructors

There are 4 constructors. They set IP address and port from which the data will be received.

### Starting loading

Loading is started by the StartDataReceiving() method. Previously received data is deleted before starting.

### Finish loading

The StopDataReceiving() method is used to stop loading.

### Getting results

1. Total number of measurements: The ReceivedDataCount() method returns the total number of measurements from all devices.
2. Counts of measurements on individual devices: The CountOfReceivedMessagesGroupedByDevicess() method returns an xml document in the following format:

<devices>

<device>

<device\_id>1</device\_id>

<count>3</count>

</device>

<device>

<device\_id>2</device\_id>

<count>3</count>

</device>

<device>

<device\_id>3</device\_id>

<count>2</count>

</device>

. . .

</devices>