Background

CAREL decide some times ago that the Modbus become the standard to communicate with device.  
Modbus have, like other protocols, some timeouts, for example due to a missing response, when a client send a request and the server device don’t respond.  
The upgrade of the FW of a device is performed with Modbus through the file transfer command (MFT).

The problem

Some device that implements the MFT to upgrade itself use a technique that write the FW in Flash on the fly (A), and send the acknowledge of the command at the end of the write.  
This is an interesting optimization but potentially a the trouble could be rise, this operation take some time and this time exceed the maximum timeout time that a client wait before “declare” that the device not respond.  
This also generate another “mistake” if you take a look to the traffic with an oscilloscope, you will see some response from the server in wrong position and this generate some confusion, in our case this happened immediately after the retry.

The solution  
Just to be clear the right solution does not exist, because this type of server device implement the FW in a way that is out of Modbus specification (A).  
The only way to resolve is to increment the timeout period.  
The suggestion, if possible, is to change the timeout only for the MFT command, this limit the impact on the rest of implementation.

Points to remember

The main reason of this Lesson Learned is regarding the fact that is possible that in the future some OEM decide to integrate the upgrade feature our self in their infrastructure, in the case it use a standard Modbus implementation, in some cases, the upgrade procedure could be fail.

Another point is that for the new devices a measure of the FW upgrade writing speed is requested, this to understand in advance if a such type of problem could be happen.

Details

The problem was found with the FW upgrade feature implemented through a cloud gate mini connected to a cpCO.