

AmICA node protocol 1.0 description

This document describes the AmICA node protocol V. 1.0. Chapter 1 gives a first overview of the protocol, while chapter 2 describes it in detail.



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1 Overview

The AmICA node protocol ensures basic communication functionality between the nodes and the node network and a computer (sink). It supports up to 256 different networks with each up to 255 users and one broadcast address per network. The header consists of seven bytes and a packet can contain up to 255 bytes payload. While a CRC mechanism is integrated, carrier sensing, synchronization, hopping/routing and acknowledgement mechanisms are not implemented yet. The AmICA node protocol is a stateless protocol.

1.1 Overall frame structure

Every packet, which is sent via the radio module, has to start with three dummy bytes (0xAA = 0b10101010) enabling the receiver to adapt to the exact frequency of the incoming packet. These bytes are followed by two synchronization bytes (0x2D = 0b00101101 and 0xD4 = 0b11010100). Afterwards, the actual AmICA frame is sent. After the AmICA frame, another three dummy bytes (0xAA = 0b10101010) have to be sent. Fig. 1 gives an overview of the overall frame structure.

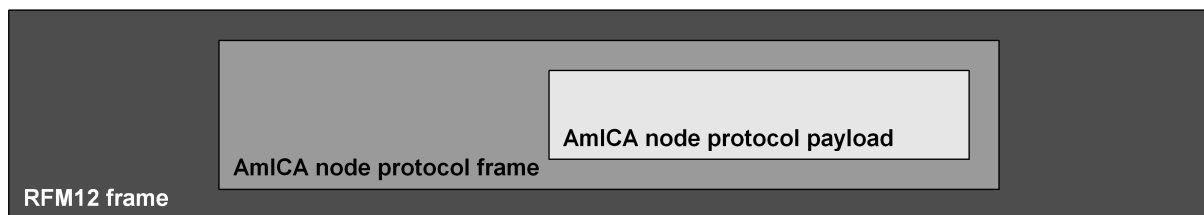


Fig. 1 Overall frame structure

2 AmICA node protocol 1.0

Each packet of the AmICA node protocol 1.0 consists of seven header bytes followed by the payload with a length between 0 and 255 bytes. The nodes are identified with a unique combination of the “node ID” and the “netgroup”. The node ID 255 is used as broadcast address. Node ID 250 is often used for the debugger node in combination with the AmICA debugger toolkit AmICA_Node_Control. Tab. 1 gives an overview in textual form, Fig. 1 in graphical form of the AmICA node protocol.

Byte	Name	Length	Explanation
0	Header byte	1 byte	0b1100VVMM (VV: version; 00 = V. 1.0, 01 = RESERVED 10 = RESERVED 11 = RESERVED) (MM: mode: 00 = normal mode, 01 = RESERVED 10 = RESERVED 11 = debug mode)
1	Source address	1 byte	Node ID of sender
2	Destination address	1 byte	Node ID of receiver
3	Netgroup	1 byte	Netgroup of sender and receiver
4	Sequence number	1 byte	USAGE OPTIONAL: can be used individually; used for example in the wireless re-programming
5	Checksum	1 byte	All bytes (including header byte, source address, destination address, netgroup, sequence number, checksum, payload length and all payload bytes) have to be in sum 0xFF
6	Payload length	1 byte	Length of the payload (between 0 and 255 bytes)
7..261	Payload	0..255 byte(s)	Payload data

Tab. 1 Packet description of the AmICA node protocol

It has to be considered, that the probability of one or more bit errors raises with the length of the packet.

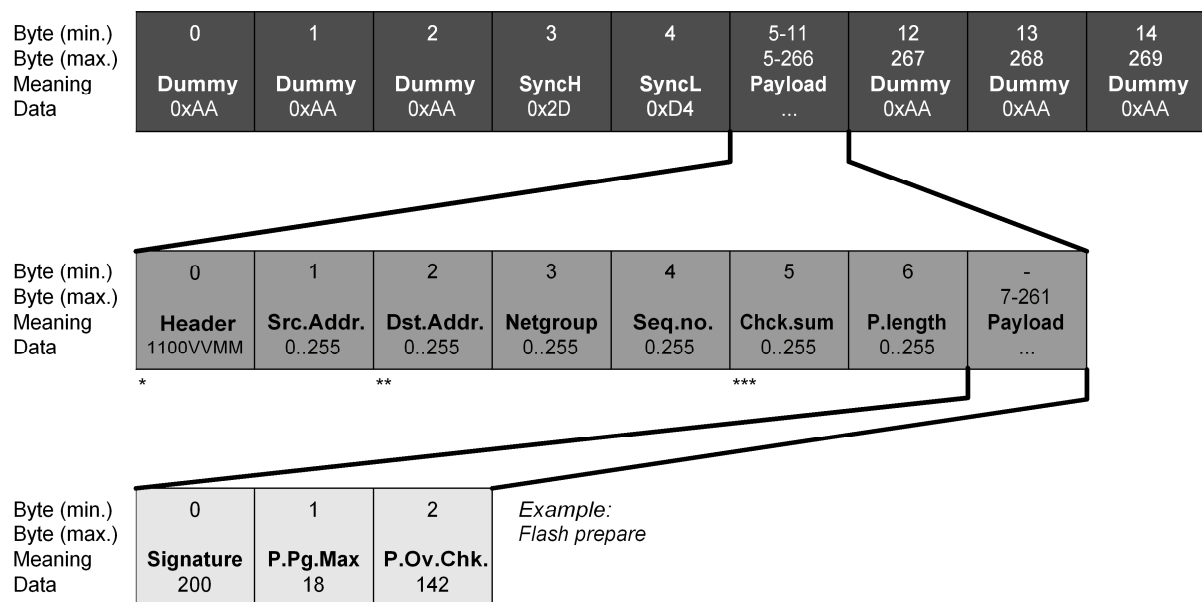


Fig. 2 Packet description of the AmICA node protocol embedded in the RFM12 frame

3 Document version history

Version	Date	Comment
1.0	2011-05-30	First version.

4 Copyright

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<http://amica-system.com/>