

# **T+A**

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## **Protocol Description**

# **RS 232 - RLINK Adapter**

**- V1.1.0 -**

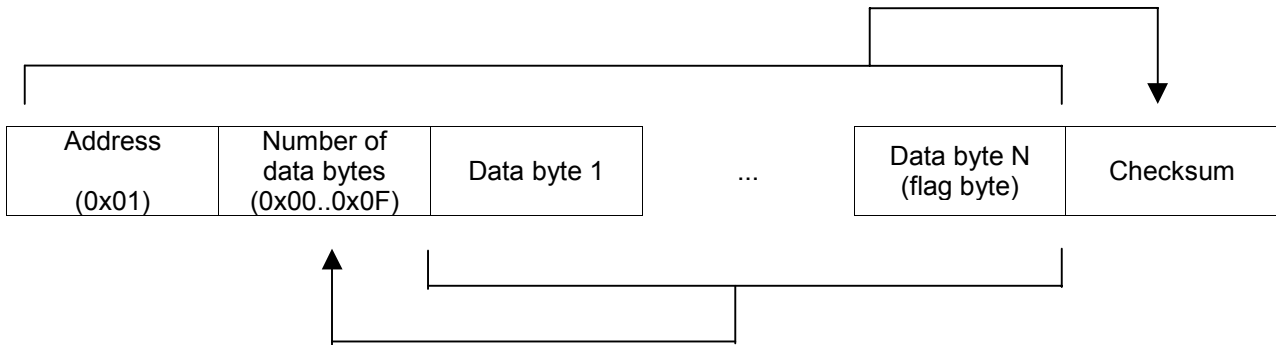
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# 1 General RS 232 communications protocol

The basic structure of a command between an RS232 device and the **T+A** RS232 adapter is as follows:



- Address: The **T+A** RS232 adapter has the fixed address 0x01
- No. of data bytes: Number of subsequent data bytes (max. 16) (including the flag byte)
- Flag byte: Last data byte for use with a Crestron device: 02 (hex)
- Checksum: The lowest-value byte (low byte) of the sum of all preceding bytes ("address", "No. of data bytes", "flag byte" and data bytes)

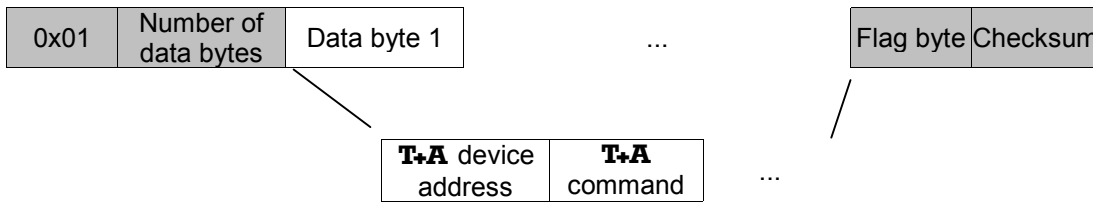
If a valid command is received from the adapter (i.e. the received and calculated checksums agree), an Acknowledge signal is sent back to the control unit as confirmation. This Acknowledge has the following format:

Address (0x01)	Checksum
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Checksum: the checksum of the received command is used as the checksum!

## 2 Transmission of commands to **T+A** devices using the general protocol

The actual control command of a **T+A** device is implemented as data bytes in the general structure:



Device address: (C8 hex) This is a **T+A** specific device address which permits the transmission of control commands

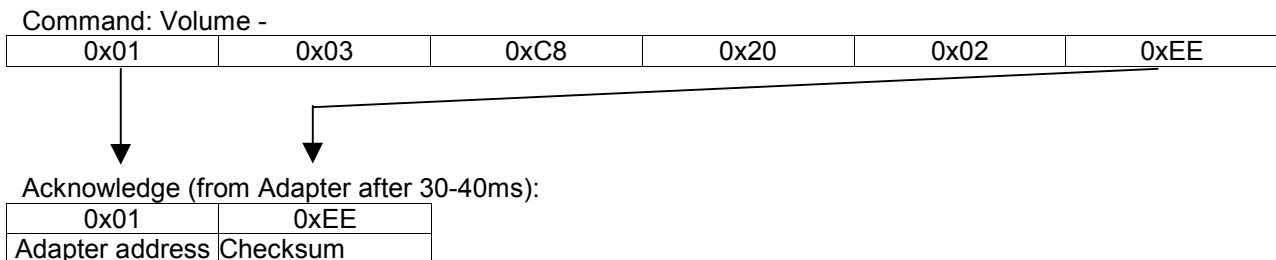
Command: Control command (see Section 5.1)

Here is an example:

*Transmission to **T+A** K6*  
Command: Volume -

0x01	0x03	0xC8	0x20	0x02	0xEE
Adapter address	Length	<b>T+A</b> device address C8 (hex)	<b>T+A</b> command (Volume-)	Flag byte	Checksum

As already described in Section 2, the adapter sends back an Acknowledge sequence if a valid command is transmitted; the complete transmission therefore takes the following form:



If the command cannot be fed to the addressed device, a 'Not Acknowledge' sequence will be sent back by the adapter. There are two possible replies:

NACK (from Adapter after 30-40ms):

0x01	0xED
adapter addr.	checksum <b>-1</b>

The R-Link Bus cannot be serviced by the adapter  
*possible reasons:* the R-Link cable is not connected, master device is not powered up

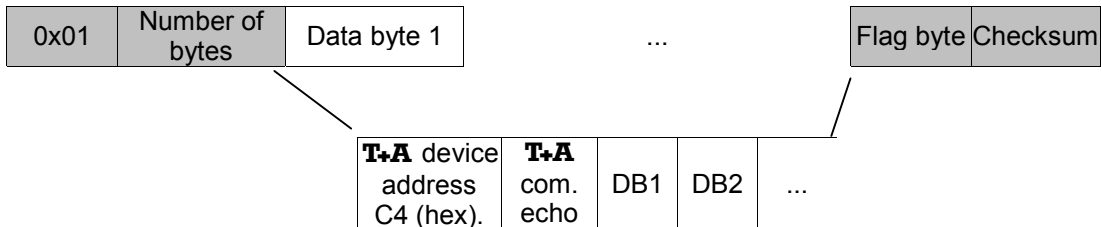
0x01	0xEC
adapter addr.	checksum <b>-2</b>

The adapter can communicate with the master device, but the addressed device doesn't answer.  
*possible reason:* the addressed device is busy

### 3 Return transmission from **T+A** devices (status transmission)

Commands are available which cause a device status signal to be sent back in order to receive information about the current status of a **T+A** device.

This transmission also occurs within the framework of the general communications protocol, although the data byte usage differs slightly from the transmission protocol.



Device address: (C4 hex) This is a **T+A**-specific device address which grants access to the status register!

Command echo: The query command is repeated at this point

DB1, DB2, ... : Current status information (varies according to queried status)

*Example:*

Command: query amplifier status

0x01	0x03	0xC4	0x64	0x02	0x2E
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Acknowledge (from Adapter):

0x01	0x2E
Adapter address	Checksum

Answer (via Adapter):

0x01	0x05	0xC4	0x64	DB1	DB2	DB3	0x...
		Address echo	Command echo	Status bytes			Checksum

Required acknowledge:

0x01	0x...
Adapter address	Checksum

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