

**HART
Protocol Monitor
of
Unsurpassed
Technical Excellence**

FrameAlyst

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HartTools 7.1

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HartTools 7.1

Borst Automation
Embedded Solutions

General

- Monitoring Hart Communication
- Protocol Analysis
- Timing Analysis
- Save and Load Monitor Sessions
- Decoding of Data
- Hart 5, 6 and 7 (e.g. Extended Commands)
- Selectable Baudrate (e.g. Multiplexers)
- Filter Functions
- Trigger Functions

Platform and Interfaces

- Windows XP, Vista, 7
- 32 Bit and 64 Bit
- COM 1-255
- USB COM Ports

Special Functions

- COM Port Re-Configurable (e.g. Parity)
- Master Emulation
- Slave Emulation
- Data Description Language for Encoding
- Frame Description Language for Decoding

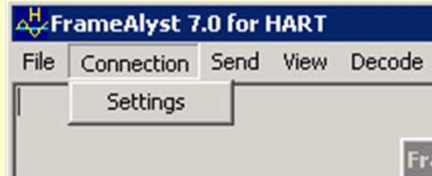
Overview

The screenshot shows the FrameAlyst 7.0 HART interface with the following callouts:

- Frame Type**: Points to the frame type field in the data stream.
- Preambles**: Points to the preamble bytes (FF FF FF FF FF) in the data stream.
- Command**: Points to the command field in the data stream.
- Response Codes**: Points to the response code field in the data stream.
- Time (ms) since previous frame ended.**: Points to the time interval between frames.
- Time of the duration of the frame.**: Points to the duration of a single frame.
- Effect at switching off the carrier. Caused by the electronics of the device or the modem.**: Points to a period of inactivity in the data stream.
- Address Field**: Points to the address field in the data stream.
- Length**: Points to the length field in the data stream.
- Data Field**: Points to the data field in the data stream.
- Caused by the electronics.**: Points to a period of inactivity in the data stream.

```
----->SSTXP|FF FF FF FF FF|02|82| |Cmd0|0|0|
00093<
00074>SACKP|FF FF FF FF FF|06|82| |Cmd0|14|0|48|FE 11 C8 05 05 02 0B 08
00223<
00054>|FF
00009 ### Frame Error: Too few preamble bytes!. ###
05058>SSTXP|FF FF FF FF FF|02|82| |Cmd0|0|80|
00093<
00074>SACKP|FF FF FF FF FF|06|82| |Cmd0|14|0|48|FE 11 C8 05 05 02 0B 08
00222<
12318>LSTXP|FF FF FF FF FF|82|91 C8 64 05 DA|Cmd1|0|61|
00130<
00075>LACKP|FF FF FF FF FF|86|91 C8 64 05 DA|Cmd1|7|0|48|20 41 A0 7B 60|F0|FF
00260<
13035>LSTXP|FF FF FF FF FF|82|91 C8 64 05 DA|Cmd13|0|6D|
00130<
00074>LACKP|FF FF FF FF FF|86|91 C8 64 05 DA|Cmd13|23|0|48|53 2C 30 82 08 20 48
00423<
```

Setting up a Connection



FrameAlyst 7.0 Functional Settings

Active Role
 None Master Slave

Com Port: COM1

Initial Master Type: Primary

Baudrate: 1200

Number of Preambles: 5

Number of Retries: 0

Retry if Busy: No

Slave Address: A_02

Tag Name: T200

Addressing Mode
 Long Short Tag Name

Hart Version
 Hart 5.x Hart 6.x Hart 7.x

Unique ID
 Hexadecimal

Apply Cancel OK

The FrameAlyst can emulate a slave or a master.

Long is normal mode.

Master will try selected version.

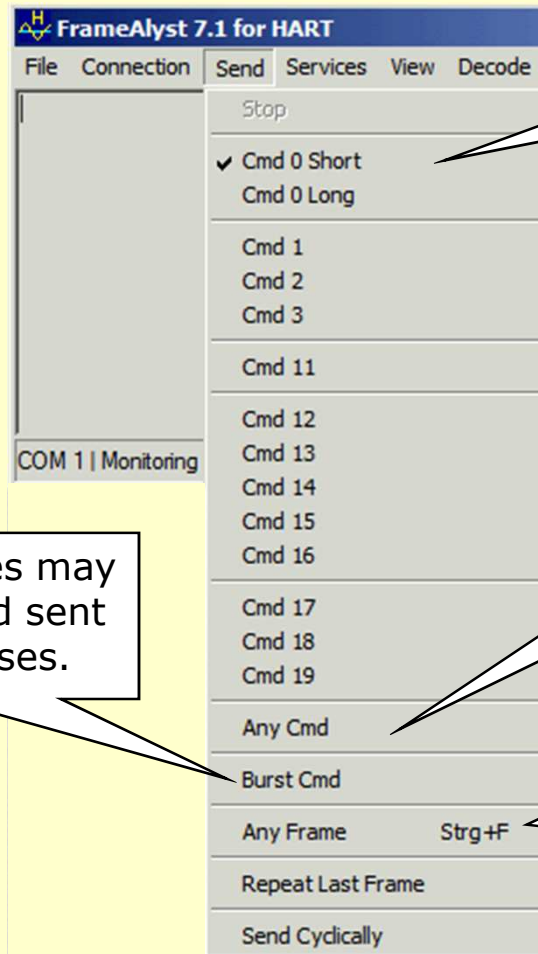
For the tests of multiplexers the unique id of a device may be preset.

Initial role in master mode.
 Note: This will automatically be switched if other master is detected.

If master receives a busy signal it will retry until a valid response was sent by the device.

If Tag Name is selected it will be the short tag in Hart 5 mode and the long tag in Hart 6 or 7.

Sending Hart Requests



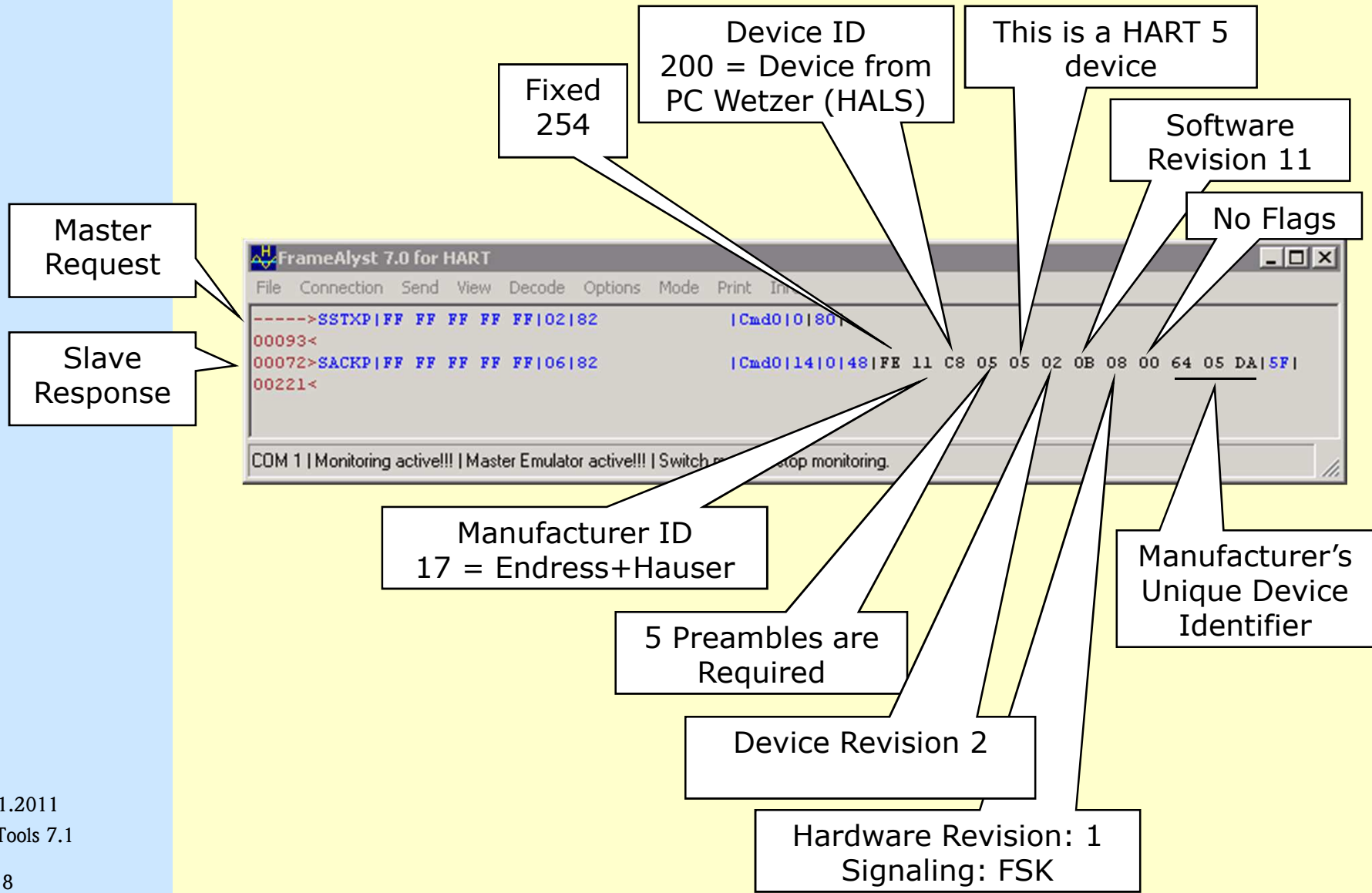
Normally command 0 is sent with short (polling) address.

Any Cmd is used to encode any device specific command.

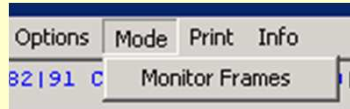
Also burst frames may be compiled and sent for test purposes.

Any Frame allows to compile any byte stream to be sent. This function is used to test the protocol stack.

Example: Command 0, Identify Device

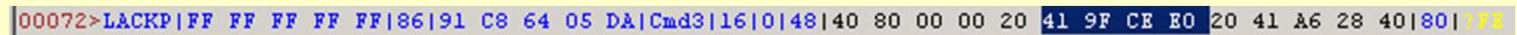


Decoding Float Data

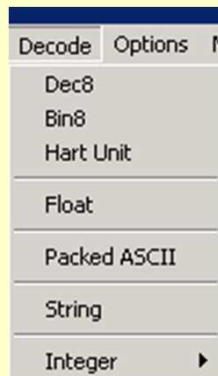


1. Monitoring Frames has to be disabled

2. The data to be decoded has to be selected.



3. Click ,Float` in the Menu ,Decode`



4. The decoded value is displayed



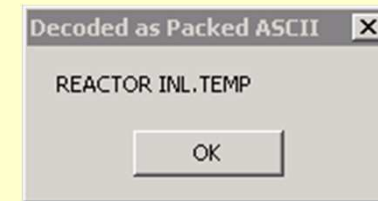
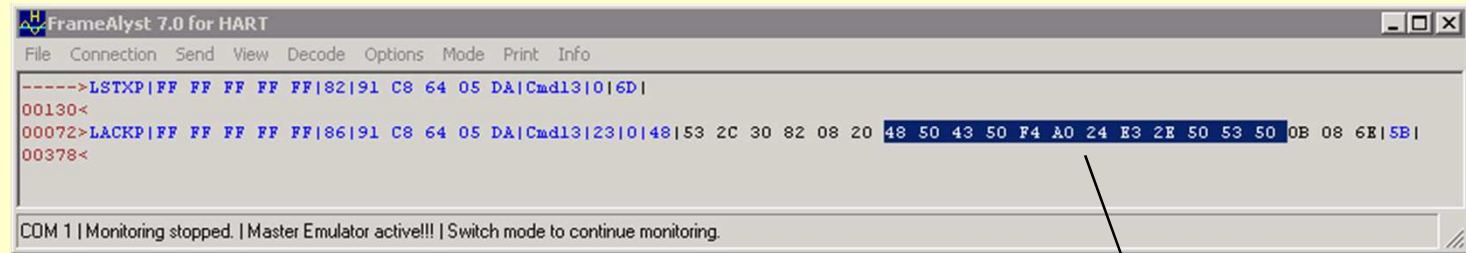
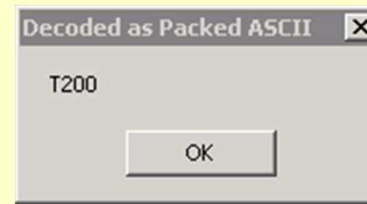
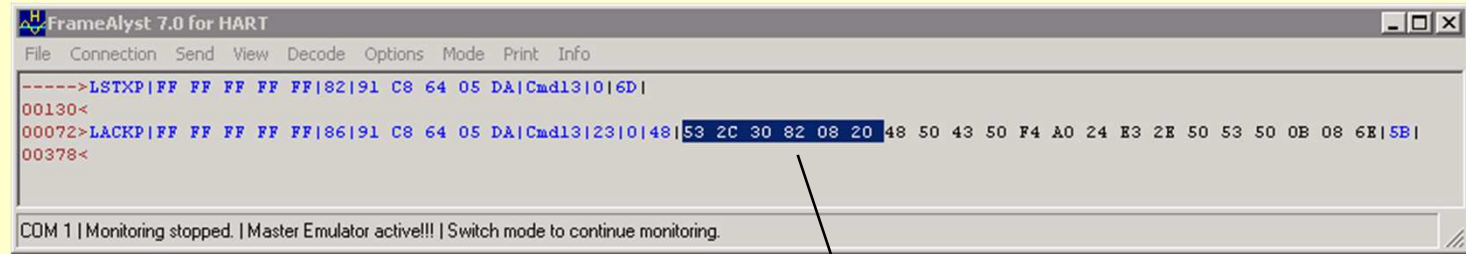
For displaying the unit



Select the byte containing the unit code and click ,Hart Unit` in the Menu ,Decode`.



Decoding Packed ASCII



Data Description Syntax

Command 18 to be sent

Note: Small characters will be converted to capital characters before encoding to packed ASCII.

All items are separated by a ; character

Default data type is integer 8 decimal

6 byte of packed ascii

Text to be packed 'harttest'

12 byte of packed ascii

Text to be packed 'FrameAlyst 7.1'

3 byte for the date 30.1.2011

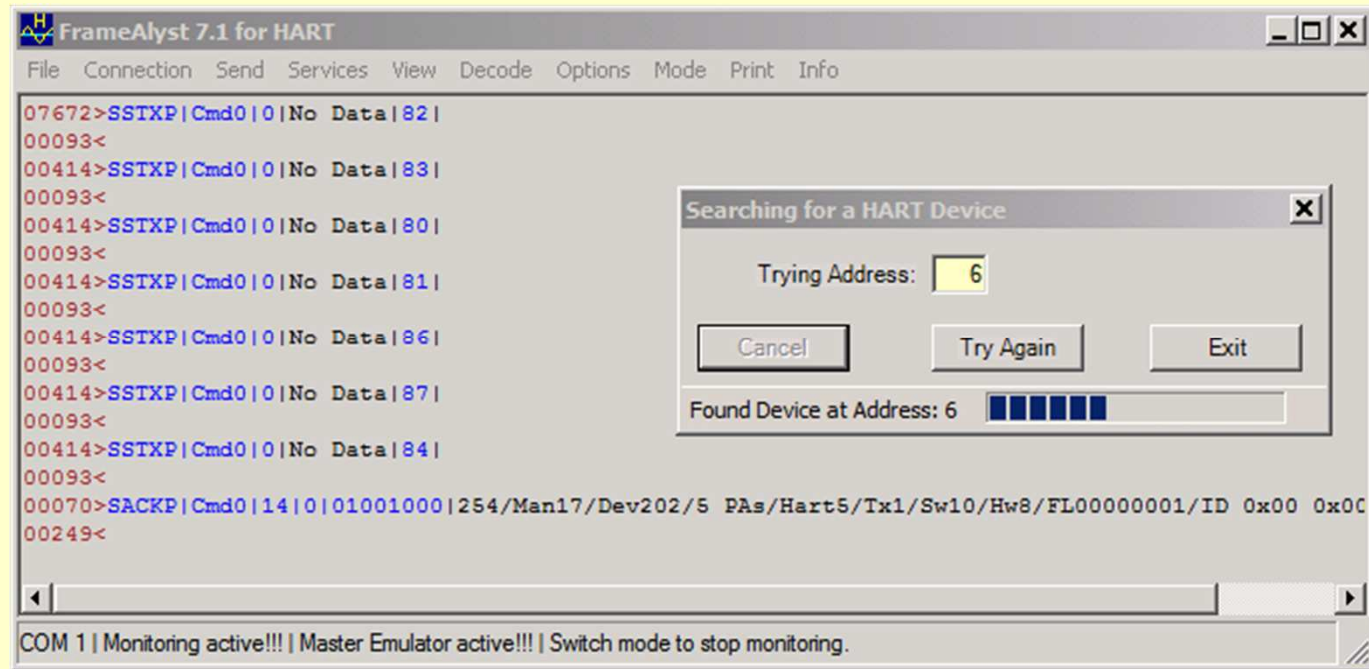
Send an Individually Specified Command

Command: 18

Data: pca6;harttest;pca12;'FrameAlyst 7.1 '";30;1;101

Cancel OK

New: Search Devices



New: Reading Device Data

The screenshot shows the FrameAlyst 7.1 for HART software interface. The main window displays a terminal log with HART protocol commands and responses. A 'Read Device Information' dialog box is open, displaying the following fields:

- Manufacturer ID: 17
- Device Type: 202
- Preambles Required: 5
- HART Revision: 5
- Device Revision: 1
- Software Revision: 10
- Hardware Revision: 1
- Range: 0 to 400 °C
- Primary Variable: 122,2824 °C
- Secondary Variable: 25,27606 °C
- Tertiary Variable: 122,2824 °C
- Quarternary Variable: Not Used -/-
- 4 mA
- 30,57197 %

Checkboxes on the right side of the dialog:

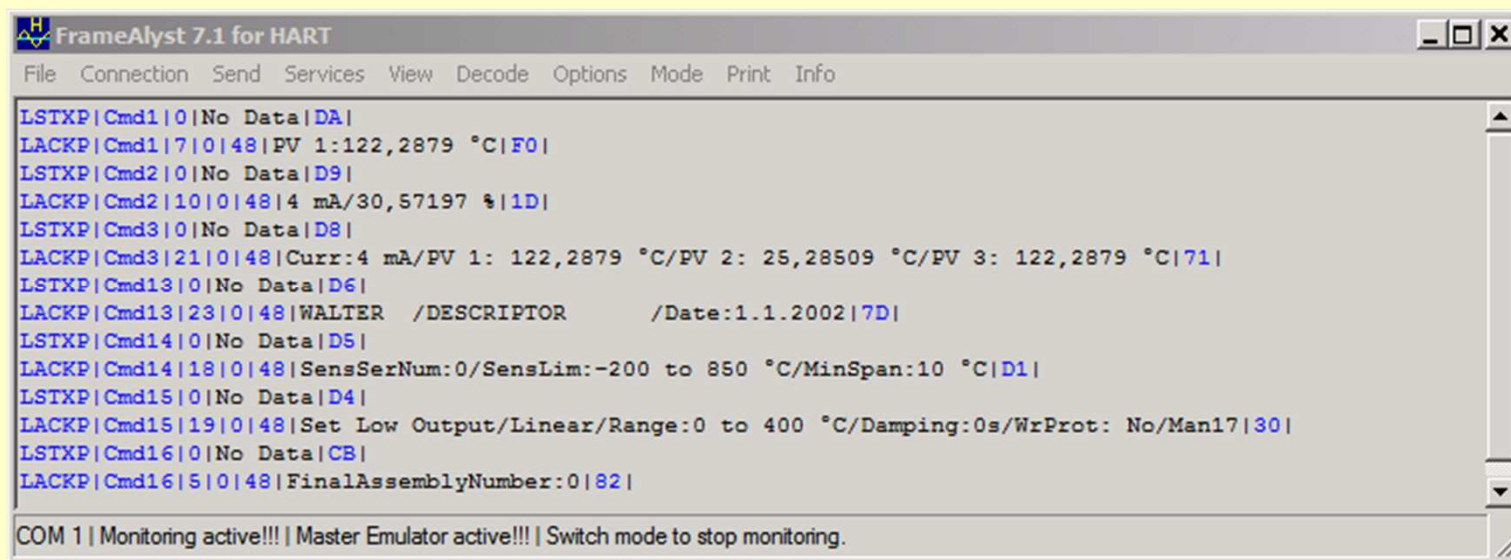
- Primary Variable Out Lim
- Other Variable Out Limits
- Loop Current Saturated
- Loop Current Fixed
- More Status Available
- Cold Start
- Configuration Changed

Buttons at the bottom: Cancel, Read, Exit.

Status bar: Reading Data Completed. [Progress bar]

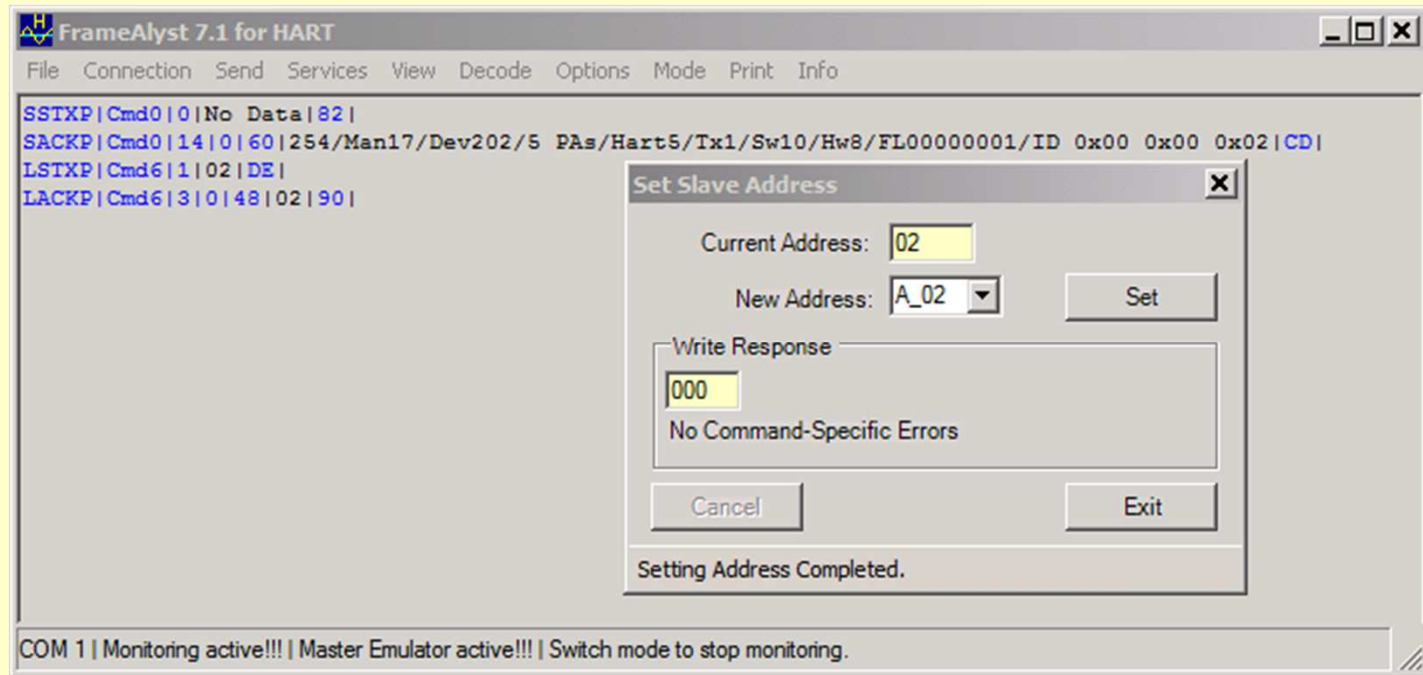
Bottom status bar: COM 1 | Monitoring active!!! | Master Emulator active!!! | Switch mode to stop monitoring.

Decode Data in known Frames

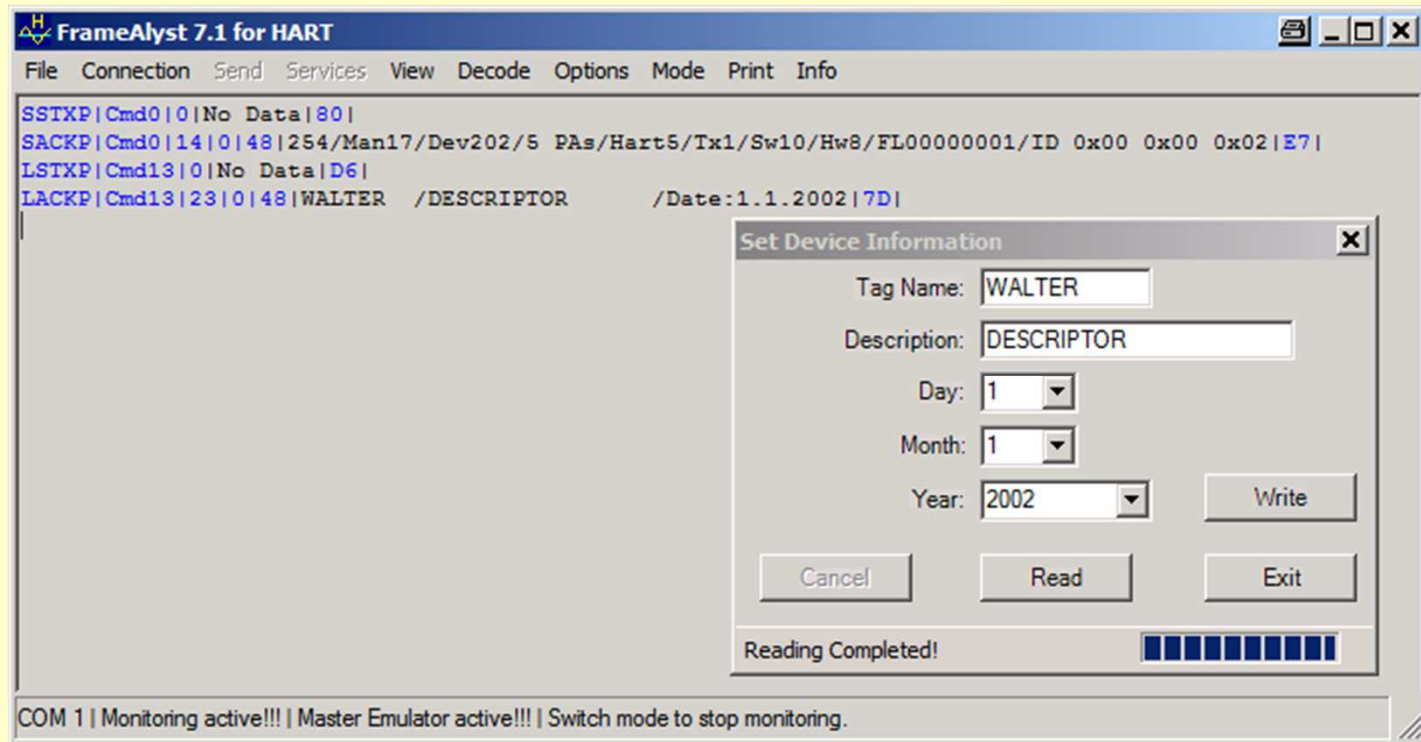


```
FrameAlyst 7.1 for HART
File Connection Send Services View Decode Options Mode Print Info
LSTXP|Cmd1|0|No Data|DA|
LACKP|Cmd1|7|0|48|PV 1:122,2879 °C|F0|
LSTXP|Cmd2|0|No Data|D9|
LACKP|Cmd2|10|0|48|4 mA/30,57197 %|1D|
LSTXP|Cmd3|0|No Data|D8|
LACKP|Cmd3|21|0|48|Curr:4 mA/PV 1: 122,2879 °C/PV 2: 25,28509 °C/PV 3: 122,2879 °C|71|
LSTXP|Cmd13|0|No Data|D6|
LACKP|Cmd13|23|0|48|WALTER /DESCRIPTOR /Date:1.1.2002|7D|
LSTXP|Cmd14|0|No Data|D5|
LACKP|Cmd14|18|0|48|SensSerNum:0/SensLim:-200 to 850 °C/MinSpan:10 °C|D1|
LSTXP|Cmd15|0|No Data|D4|
LACKP|Cmd15|19|0|48|Set Low Output/Linear/Range:0 to 400 °C/Damping:0s/WrProt: No/Man17|30|
LSTXP|Cmd16|0|No Data|CB|
LACKP|Cmd16|5|0|48|FinalAssemblyNumber:0|82|
COM 1 | Monitoring active!!! | Master Emulator active!!! | Switch mode to stop monitoring.
```

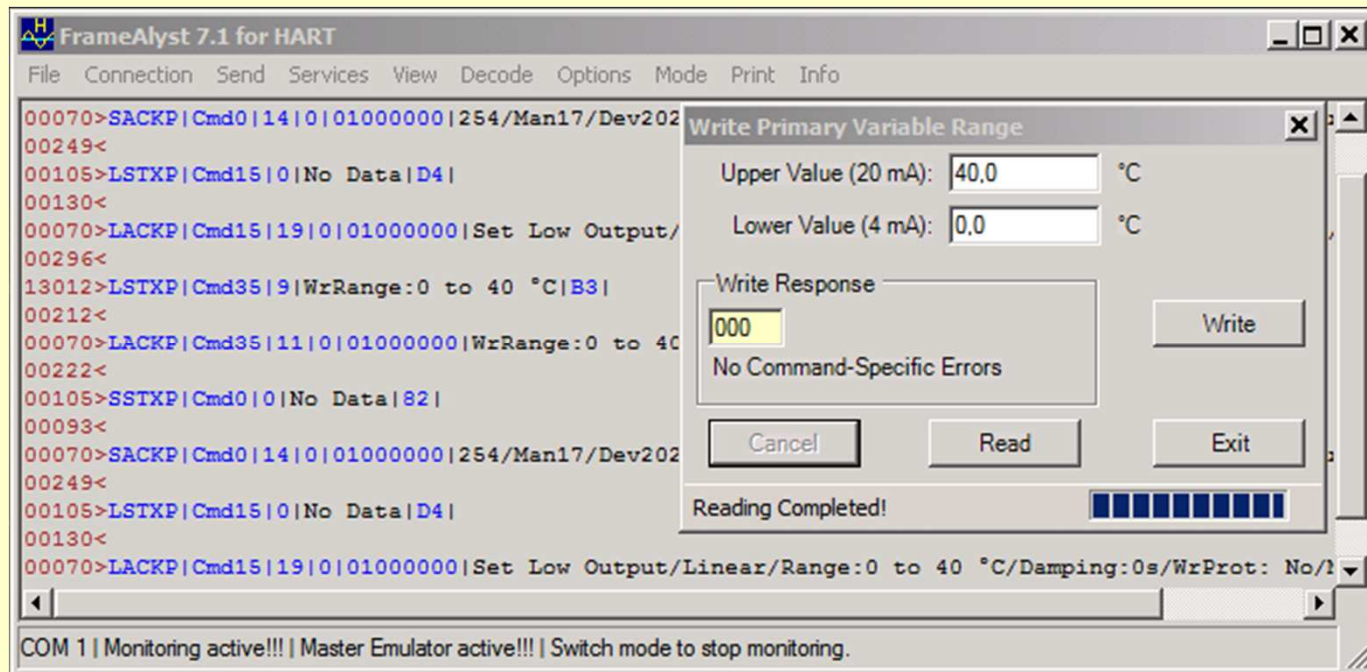
Set Device Address



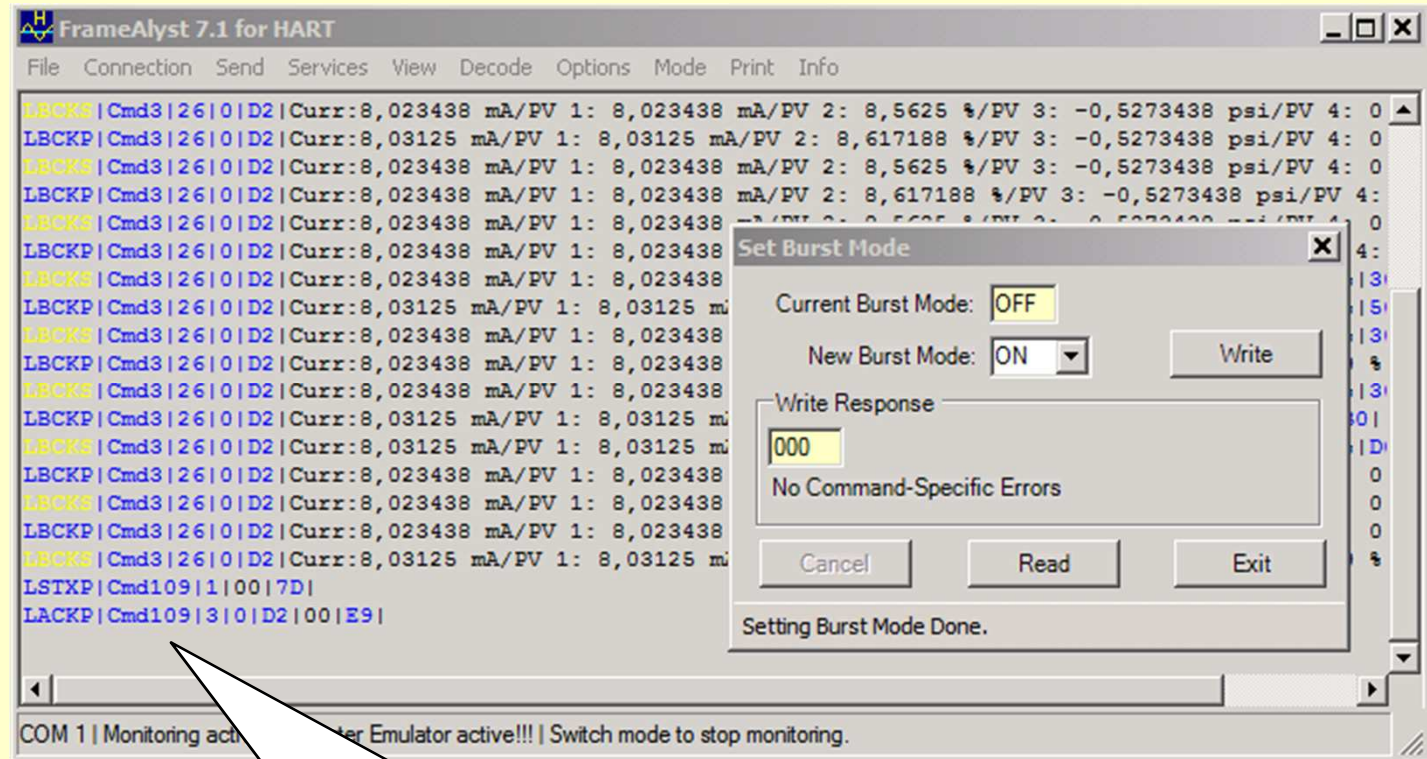
Set Tag, Descriptor, Date



Set Range



Set Burst Mode



Command 109 is used to switch the burst mode on and off.