

Communication Protocol for 371X Electronic Load

A. Default Serial Communications Port Settings

- 1) Baud Rate: 9600
- 2) Data Bits: 8
- 3) Stop Bits: 1
- 4) Handshake: None

B. Frame Format(applies to both transmitted and received data)

The frame length is 26 bytes with the following format:

AAh	Address	Command	Relative information of Bit 4 - 25	Checksum
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Description of frame bytes:

1. The first byte of the frame is always AAh.
2. The second byte is the instrument address(00h-FEh as set using front panel menu).
3. The third byte is the instrument control Command(90h-A0h).
These are the possible commands:
 - 1)90h-----Set max current, max power and set-value.
 - 2)91h-----Read current, voltage, power and instrument's state.
 - 3)92h-----To control the ON/OFF state of the load
 - 4)93h-----Programmed test sequesnce,define odd step1-5
 - 5)94h-----Programmed test sequesnce,define odd step 6-10
 - 6)95h-----Start prograded test sequence
 - 7)96h-----Stop prograded test sequence
4. Byte 4 to byte 25 are the instrument data being sent or received .
5. Byte 26 is the Checksum obtained by adding the values of the previous 25 bytes.
For example,this is the command you would use to query the state of the instrument...
AA 01 91 00 3C
6. The voltage range of 0-360V is represented by an integer in the range of 0-360000.
7. The current range of 0-30A is represented by an integer in the range of 0-30000.
8. The power range of 0-200W can be expressed as an integer in the range of 0-2000.
9. The resistance range of 0-500Ω,can be expressed as an integer in the range of 0-50000.

C. Command Descriptions

1) 90h, Set load operating parameters and maximum limits

Byte 1	Frame start(AAh)
Byte 2	Address (00h-FEh)
Byte 3	Command (90h)
Byte 4	Low byte of the maximum current
Byte 5	High byte of the maximum current
Byte 6	Low byte of the maximum power
Byte 7	High byte of the maximum power
Byte 8	New address of the Load(change address)
Byte 9	Type of set-value: 01h=current, 02h=power, 03h=resistance
Byte 10	Low byte of set-value
Byte 11	High byte of set-value
Byte 12 - 25	System Reserved
Byte 26	Checksum

The set-values for current, power and resistance are all expressed by two bytes. The low byte is sent first.

For example, the set-value 3589H is specified by the following sequence:

89h	35h
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2) 91h, Read current, voltage, power and resistance of the instrument

Byte 1	Frame start (AAh)
Byte 2	Address (00h-FEh)
Byte 3	Command (91h)
Byte 4	Low byte of the current
Byte 5	High byte of the current
Byte 6	Low byte of the low character of the voltage
Byte 7	High byte of the low character of the voltage
Byte 8	Low byte of the high character of the voltage
Byte 9	High byte of the high character of the voltage
Byte 10	Low byte of the power
Byte 11	High byte of the power
Byte 12	Low byte of the max current
Byte 13	High byte of the max current
Byte 14	Low byte of the max power
Byte 15	High byte of the max power
Byte 16	Low byte of the resistance value
Byte 17	High byte of the resistance value
Byte 18	Output state of the electronic load
Byte 19 - 25	System reserved
Byte 26	Checksum

The output state of the load is revealed by the individual bits of byte18:

From High to Low

b7	b6	b5	b4	b3	b2	b1	b0
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b0: 0= local (front panel)control; 1=remote (PC) control.

b1: 0=load OFF; 1= load ON.

b2: 0= correct polarity detected; 1= wrong polarity detected

b3: 0=temperature in acceptable range; 1=excessive temperature.

b4: 0= voltage acceptable; 1= excessive voltage.

b5: 0= power acceptable; 1= excessive power

Note: values of bytes 4 through 18 in command string will be ignored by instrument(suggest setting these to 00h); reply from instrument will have valid data in bytes 4 through 18.

3)92h, Activate or deactivate load and set local/remote control

Byte 1	Frame start (AAh)
Byte 2	Address (00h-FEh)
Byte 3	Command (92h)
Byte 4	State of the electronic load
Byte 5- 25	System Reserved
Byte 26	Checksum

The desired state of the load is specified by the individual bit of byte4:

From High to Low

b7	b6	b5	b4	b3	b2	b1	b0
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b0: 0= load OFF ;1=load ON.

b1: 0=go to local mode(front panel control);1=go to remote control(PC control).

4) 93h, Define programmed test sequence, steps 1-5

Byte 1	Frame start (AAh)
Byte 2	Address (00h-FEh)
Byte 3	Command (93h)
Byte 4	Type of setting;01h=current,02h=power,03h=resistance
Byte 5	Total number of program steps (1-10)
Byte 6	Low byte of step 1 setting
Byte 7	High byte of step 1 setting
Byte 8	Low byte of step 1 duration(seconds)
Byte 9	High byte of step 1 duration
Byte 10	Low byte of step 2 setting
Byte 11	High byte of step 2 setting
Byte 12	Low byte of step 2 duration
Byte 13	High byte of step 2 duration
Byte 14	Low byte of step 3 setting
Byte 15	High byte of step 3 setting
Byte 16	Low byte of step 3 duration
Byte 17	High byte of step 3 duration
Byte 18	Low byte of step 4 setting
Byte 19	High byte of step 4 setting
Byte 20	Low byte of step 4 duration
Byte 21	High byte of step 4 duration
Byte 22	Low byte of step 5 setting
Byte 23	High byte of step 5 setting
Byte 24	Low byte of step 5 duration
Byte 25	High byte of step 5 duration
Byte 26	Checksum

5) 94h, Define programmed test sequence, Steps 6-10

Byte 1	Frame start (AAh)
Byte 2	Address (00h-FEh)
Byte 3	Command (94h)
Byte 4	Low byte of step 6 setting
Byte 5	High byte of step 6 setting
Byte 6	Low byte of step 6 duration
Byte 7	High byte of step 6 duration
Byte 8	Low byte of step 7 setting
Byte 9	High byte of step 7 setting
Byte 10	Low byte of step 7 duration
Byte 11	High byte of step 7 duration
Byte 12	Low byte of step 8 setting
Byte 13	High byte of step 8 setting
Byte 14	Low byte of step 8 duration
Byte 15	High byte of step 8 duration
Byte 16	Low byte of step 9 setting
Byte 17	High byte of step 9 setting
Byte 18	Low byte of step 9 duration
Byte 19	High byte of step 9 duration
Byte 20	Low byte of step 10 setting
Byte 21	High byte of step 10 setting
Byte 22	Low byte of step 10 duration
Byte 23	High byte of step 10 duration
Byte 24	Program mode (00h=run once;01h=repeat)
Byte 25	System Reserved
Byte 26	Checksum

6) 95h, Start programmed test sequence

Byte 1	Frame start (AAh)
Byte 2	Address (00h-FEh)
Byte 3	Command (95h)
Byte 4 - 25	System Reserved
Byte 26	Checksum

7) 96h, Stop programmed test sequence

Byte 1	Frame start (AAh)
Byte 2	Address (00h-FEh)
Byte 3	Command (96h)
Byte 4 - 25	System Reserved
Byte 26	Checksum