



TOTALFLOW[®]

Technical Bulletin 50

Modem Communications

Totalflow Technical Bulletin

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Modem Communications

Purpose:

To provide a basic method of implementing modem communications on Totalflow flow computers, by giving a basic explanation of modem operation, and by providing a list of initialization strings (by vendor) to assist in remote communications setup.

Procedure:

All modems available today, come pre-programmed with a factory default initialization string. Most however, are not compatible with Totalflow protocols. Most software packages including Totalflow download an initialization string directly to the modem, before actually transmitting data across the modem link. With the rapid advances in technology that we are experiencing today, some modem manufacturers are moving away from the standard Hayes command set. These deviations from the "so called" industry standard are causing additional difficulties with modem setup in the Totalflow system.

When the default initialization string provided in the CCU software fails, The AT command string must be altered to accommodate communication. Programming the modem is relatively simple, if you are familiar with a few basic modem commands.

Entering Modem Command Strings:

Entering Modem AT command strings can be done one of two ways. The Totalflow CCU software allows modem strings to be entered in the modem setup section, and provides several pre-installed strings. This allows the CCU to download the command string upon connection with the modem. The alternative is to program the modem directly using a terminal emulator such as Microsoft's® Hyperterm.exe. This allows you to input and save the AT string within the modem as a stored profile. The typical command to store a profile is `&W`. (this may vary from modem to modem, refer to your user reference manual).

The actual format of the AT string is as follows: `AT E0 N1 X0..^M`. The string must always start with the letters `AT`. This puts the modem in command or "attention" mode. Next the actual commands are entered, and then the string is terminated with a `^M`, which instructs the modem to exit the command mode. The `^M` is refer to as a "caret-M", and is entered by using a shift-6 key and then the letter M.

When using AT commands, it is sometimes an advantage to place spaces in between the commands as they are entered. This makes them easier to read. The modem ignores spaces in the command string, so this is strictly a user preference. When entering AT commands, do not mix upper and lower case letters within the command string. The modem will accept either upper or lower, but will produce an error when the two are used together.



Command Format:

Modem AT commands are made up of a combination of letters and numbers. Typically, there is a letter that designates the command function, and a number that determines how that function will be used. For example, *V0* sets the modem to display result codes as number; *V1* sets it to display result codes as words. This letter-number combination has long been the standard in modem command sets, however later day modems that have expanded capabilities have been forced to use additional command designators such as the ampersand (&) the percent sign (%), and the backslash (\).

S-Registers:

In addition to the letter commands, there are a series of S-registers that also have an effect on modem operation. These can have independent functions or act as modifiers to existing letter commands. Totalflow communications requires very few changes to S-register settings. There are a few, however, that should be addressed in this document. The *S0* register controls the auto answer function, and will have to be set to a value of 1 in remote modem configurations. The *S37* register controls the baud rate the modem communicates at and should be set to the desired speed of communication.

Modem Functions:

Regardless of the brand of modem that you are using, or the command set being used, the functions involved in setting up communications for Totalflow is the same. If you are using a modem that does not use the standard Hayes command set, look in the modem documentation, and select the command that performs the equivalent function in your particular modem. The following functions are critical to communication with Totalflow products.

Flow control:

Using the *K* command sets flow control. Flow control must be turned *off* to achieve successful communications with Totalflow products, and is typically designated by the *&K0* command. This can vary in modems not using the Hayes command set.

Asynchronous Communication, Error Correction:

Synchronous\Asynchronous communication is set by using the *&Q* command. Totalflow protocol requires the modem to be setup for asynchronous communications. Newer modems, which communicate at baud rates in excess of 14.4k baud, usually have to be set to asynchronous with speed buffering. The typical settings for this command are: *&Q0* (asynchronous) and *&Q6* (asynchronous with speed buffering). The *&Q* command also sets the modem for error control. When selecting asynchronous settings, if modes that incorporate error correction do not work, a selection that disables error correction will have to be used.



Echo:

Using the E command sets the echo command. This command is usually set to one of two choices. *Echo on*, echo's characters from the keyboard back to the screen to allow them to be seen as they are typed. *Echo off*, disables this function. Echo should be turned *off*, for proper communications with Totalflow. The typical setting to do this is *E0*.

Result Codes:

When using older versions of CCU software (DOS versions) result codes should be set to display as numbers instead of words. CCU software that utilizes newer versions of WinCPC should have result codes displayed as words (verbose). The typical AT command for result codes is the V command (V0, V1, etc.).

Host Modem Command Strings:

The following is a list of command strings for modems that are known to work with Totalflow products. These may not work in all situations, but hopefully will aid you in setting up your modem to communicate with Totalflow products.

Boca 2400 V.42bis MNPS

```
AT &F &C1 &D2 Q0 V1 E0 L0 S7=45^M
```

Cardinal 28.8

```
AT E0 N1 T Q0 V0 &C1 &D2 &K0 &Q6 \G0 \N0 %C0 ^M
```

Gateway Telepath II 33.6 (Sportster 28.8) Fax/Voice

```
AT &F &H0 &I0 &R1 &M0 &K0 &C1 & D2 Q0 V1 E0 L0 S7=45 ^M
```

Generic 56.6 Internal Plug & Play

```
AT &F N0 S37=6 %C0 &K0 &C1 &D2 &Q0 V1 Q0 E0 LO S7=45^M  
(2400 Baud)
```

Hayes 1200

```
AT Q0 V0 L0 E0 S7=45 ^M
```



Hayes 2400

AT &F &C1 &D2 Q0 V0 E0 L0 S7=45 S0=0 ^M

Hayes Accura External 144 + Fax 144

AT &F N0 S37=0 &K0 &Q6 S36=3 S48=128 S46=136 &C1 &D2 V1 E0 Q0 ^M

Hayes V-series Ultra Smartmodem 9600

AT &F NO S37=0 &K0 &Q6 S36=3 S48=128 S46=136 &C1 &D2 V1 E0 Q0 ^M

Hayes Accura External 336 V.34 + Fax

AT &F &C1 &D2 Q0 V1 E0 L0 S7=45 ^M

Hayes Accura External 33.6/56.6 Fax—V.90/K56.6K Flex

AT &F N0 S37=5 &K0 &C1 &D2 &Q0 S38=0 ^M

(1200 Baud)

High Performance 14.4

AT E0 N1 Q0 V0 &C1 &D2 &K0 &Q6 %C0 \G0 \Q0 ^M

Infotel

AT E0 N1 T V0 Q0 &C1 &D2 &K0 &Q6 \G0 %C0 %E0 ^M

**CURRENTLY TOTALFLOW MEASUREMENT AND CONTROLS RECOMMENDS
FOR LAPTOPS THE MEGAHERTZ TELEPHONY PCMCIA MODEM CARD MODEL
XJ4336-CC4336 AS THE MODEM OF CHOICE**

MEGAHERTZ TELEPHONY PCMCIA XJ4336-CC4336 MODEM

AT &F &N1 &S37=0 &K0 \N0 %C0 &C1 &D2 Q0 V1 E0 L0 S7=45 ^M

Modem Master 6000

AT E0 V0 &C1 &D2 &K0 %C0 %E1 ^M

Motorola 28.8 Modem surfer Fax Modem



AT E0 N1 Q0 V0 &C1 &D2 %C0 %G0 \C1 \G0 \N0 \Q0 ^M

Motorola Montana 33.6

AT E0 N1 T Q0 V0 &C1 &D2 &K0 &M0 &S1 %C0 %G0 \C1 \G0 \N0 \Q0 ^M

Multitech MultiModem ZDX

AT E0 T Q0 #A0 &E0 &E3 &E12 &E14 &Q1 ^M

Practical Peripherals PC 144 MT

AT &F N0 S37=5 &C1 &D2 Q0 V1E0 L0 ^M

(1200 Baud)

Practical Peripherals 144 FX

AT E0 Q0 V0 N1 T &C1 &D2 &K0 &Q6 ^M

Practical Peripherals PM 56K Flex HC Internal

AT &F N1 S37=5 &K0 &Q6 S46=136 &C1 &D2 Q0 D1 E0 L0 S7=45^M

(1200 Baud Only)

Smart Comm Modem 2400E-00-2, 2400 BAUD

AT &F &C1 &D2 Q0 V1 E0 L0 S7=45^M

Toshiba Internal modem V.34 28.8 Data+Fax+Voice

AT E0 Q0 V0 N1 &C1 &D2 &K0 \N0 \Q0 \V0 %C0 ^M

U. S. Robotics Courier 2400

AT &F &H0 &I0 &R1 &M0 &K0 &C1 &D2 Q0 V1 E0 L0 S7=45^M

Note: Set WinCPC Max Modem Speed to 1200 Baud

U. S. Robotics Sportster External 14.4 PNP Fax

AT &F &H0 &I0 &R1&M0 &K0 &C1&D2 Q0 V1 E0 L0 S7=45 ^M



U. S. Robotics Sportster External 28.8, 33.6, 56.6

AT E0 F1 Q0 V1 &A0 &K0 &H0 &I0 &R1&Y0 &U0 &N0 ^M

Switch settings: 2-5,8-on, all others off

Here are some helpful hints for Sportster modems.

On some newer U.S. Robotics Sportster 56.6 modems, there are some features that must be disabled in order to communicate with Totalflow's modems. These commands are added to the initialization string in WinCPC. They are "S32=66" to disable V.90 standard, "S32=34" to disable X2 or "S32=98" to disable both. If desiring to communicate at a connect speed of 2400 baud only, the command is "&N3".

U. S. Robotics 56K FAX Internal PNP

AT E0 F1 Q0 V1 &A0 &K0 &H0 &I0 &R1&Y0 &U0 &N0 ^M

Note: Set WinCPC Max Modem Speed to 1200 Baud

CURRENTLY TOTALFLOW MEASUREMENT AND CONTROL RECOMMENDS THE U. S. ROBOTICS COURIER V.EVERYTHING MODEL 2806 AS THE MODEM OF CHOICE.

U. S. Robotics Courier V.Everything

AT &F &H0 &I0 &R1&M0 &K0 &C1&D2 Q0 V1 E0 L0 S7=45 ^M

Dip Switch setting: 3,5,8—on; 1,2,4,6,7,9,10—off:

There are some "AT" commands that must be entered in the modem before utilization to either "enable" or "disable" certain commands. The complete command set that must be entered are as follows: AT B0 C1 E1 F1 M1 Q0 V1 X1 &A1 &B0 &C1 &D2 &G0 &H0 &I0 &K0 &L0 &M0&N0 &P0 &R1 &S0 &T5 &U0 &X0 &Y1 %N6 #CID=0 Because the previous initialization string is so long, it must be entered in the MODEM using "terminal" or "HyperTerminal" in "sections". Please note that all "0" commands are the number "ZERO" never the letter "O". First start by typing "AT". The modem should respond with "OK". Next type AT B0 C1 E1 F1 M1 Q0 V1 X1 then hit "enter".

The modem should respond with "OK". Next type AT &A1 &B0 &C1 &D2 &G0 &I0 &K0&L0 &M0 then hit "enter". The modem should respond with "OK". Next type AT &M4 &N0 &P0 &R1 &S0 &T5 &U0 &N0 &Y1 then hit "enter". The modem should respond with "OK". Next type AT %N6 #CID=0 then hit "enter". The modem should respond with "OK". Last type AT &W then hit "enter". The modem should respond with "OK". The command "&W" must be written last as it saves this initialization string to the modem memory.



Check the revision of this modem. It should be "Supervisor rev " 7.1.1 or later and "DSP rev" 2.2.7 or later. To view your modem revision, go to "Term" and type "ATi7". Also note the Clock Frequency.

To download the latest revision go the Internet and Type—<http://Totalservice.USR.com>
A U.S. Robotics "modem upgrade wizard" is also available on the Internet at---
<http://consumer.3com/modem/muw> The phone number for U. S. Robotics Technical Support is 847-262-5151. For U. S. Robotics PCMCIA modem card support, the phone number is 1-800-638-3266.

Zoom PKT 14.4

AT &F N0 S37=0 &K0 &Q6 S36=3 S48=128 \N0 S46=136 %CO &C1&D2 V1 E0 Q0 ^M

Zoom 33.6

AT E0 N1 T Q0 V1 &C1 &D2 &K0 &Q6 %C0 \G0 \N0 ^M

Remote Totalflow Modem Command Strings:

Datel 2400 Baud Modem

B1 E0 Q0 V1 Y0 &C0 &D0 &Q0 &R0 &S1 &X0

S00: 001

Datel 9600 Baud Modem

E0 Q0 V1 W0 X1 &C0 &D0 &Q0 \A3 \C0 \G0 \H0 \J1 \K0 \N5 \T000 \V0 \X0 %A000

%B14400 %C0 %E1 %M300

S00: 001