



ModLink Modem Controller

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1. INTRODUCTION

The ModLink Modem Controller is designed to control a line or cellular modem for use with a Skye MiniMet weather station or DataHog datalogger.

The ModLink is mains powered allowing the modem connection link to the datalogger 24 hours a day.

There are 4 versions of ModLink:

1. MOD1 ModLink - this device controls a standard line modem, e.g. External PC fax modem, and connects directly to a MiniMet or DataHog logger. MOD1 ModLink includes a mains power transformer to continuously power the datalogger, eliminating the need to change batteries at regular intervals. Cable lengths of up to 50m can be used with the MOD1 ModLink.
2. MOD2 ModLink - this device controls a standard line modem, e.g. External PC fax modem, and connects to the MiniMet or DataHog logger via a Mains Hog or Mains Hog with Signal Boosters. It has no mains power transformer as this function is already in place in the Mains Hog unit.
3. MOD3 ModLink - this device controls a GSM cellular modem, e.g. Siemens TC35i, and connects to a PC to enable it to dial up a remote MiniMet or DataHog logger. There are low call cost advantages in using a cellular modem at both the PC and remote logger site.
4. MOD4 ModLink - this device controls a GSM cellular modem, e.g. Siemens TC35i, and connects directly to a MiniMet or DataHog logger. MOD4 ModLink includes a mains power transformer to continuously power the datalogger, eliminating the need to change batteries at regular intervals. Cable lengths of up to 50m can be used with the MOD1 ModLink.

The ModLink is easy to install and set up, and once in place will operate automatically with no or very little maintenance.

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2. INSTALLATION

The ModLink housing is not waterproof and is intended for indoor use only.

2.1 MOD1 ModLink

MOD1 ModLink should be installed indoors with a PC external fax modem, with only the power / data cable running outdoors to the DataHog2 / MiniMet2 datalogger.

There are 3 connections on the back panel, two cables permanently attached plus a small socket.

The small socket is the power supply connection. Plug the mains power supply connector into this socket.

The two permanently connected cables are carefully labeled. Connect the cable marked MODEM to the compatible socket on the back of the external modem (it may be necessary to use the 9 to 25 pin adapter supplied with the modem). The modem will also have its own mains power supply, plus the telephone lead which should be connected up to the local telephone line socket.

The cable marked LOGGER connects to the DataHog / MiniMet datalogger and is fitted with a round 8 pin plug. Fit the plug into the RS232 socket of the DataHog2 or MiniMet2 logger. If this means running a length of cable outdoors, make sure the cable is protected from chafing by movement and / or has a protective covering such as conduit to eliminate damage.

There is also a small black button at the rear of the MOD1 ModLink unit. This is the PSU RESET or Power Supply Unit Reset button for the datalogger itself. It is only necessary to depress this button momentarily if there has been a power interruption to the logger, such as a change of batteries or power cut. The PSU reset button is used to restart the system after power loss.

NOTE it is important that flat or exhausted batteries are not left inside the datalogger as flat batteries leak corrosive chemicals which cause serious and permanent damage to the logger.

2.2 MOD2 ModLink

MOD2 ModLink should be installed indoors with Mains Hog / Mains Hog with Signal Boosters and a PC external fax modem, with only the power / data cable running outdoors to the DataHog2 / MiniMet2 datalogger.

There are 3 connections on the back panel, two cables permanently attached plus a small socket.

The small socket is the power supply connection. Plug the mains power supply connector into this socket.

The two permanently connected cables are carefully labeled. Connect the cable marked MODEM to the compatible socket on the back of the external modem (it may be necessary to use the 9 to 25 pin adapter supplied with the modem). The modem will also have its own mains power supply, plus the telephone lead which should be connected up to the local telephone line socket.

The cable marked LOGGER connects to the DataHog / MiniMet datalogger and is fitted with a round 8 pin plug. Fit this plug into the RS232 socket of the Mains Hog. For use with a Mains Hog with Signal Boosters, the cable marked LOGGER is fitted with a male 9 pin D connector. Mate this to the female 9 pin D connector attached to the Mains Hog with Signal Boosters.

MOD2 ModLink does not have a PSU Reset button fitted as this is always used in conjunction with a Mains Hog or Mains Hog with Signal Boosters, which themselves have a PSU RESET button fitted.

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2.3 MOD3 ModLink

MOD3 ModLink should be installed indoors next to a PC which has a RS232 serial port. The GSM cellular modem is fitted inside the ModLink housing.

There are 3 connections on the back panel, two cables permanently attached plus a small socket.

The small socket is the power supply connection. Plug the mains power supply connector into this socket.

The two permanently connected cables are carefully labeled. The cable marked AERIAL is already attached to the GSM cellular aerial. Place the aerial in a suitable position as to receive the best network signal (e.g. use a standard handset phone using the same network provider to assess the maximum signal position).

The second cable marked PC is fitted with a 9 pin D connector. Connect and screw up to a RS232 serial port of the PC.

2.4 MOD4 ModLink

MOD1 ModLink should be installed indoors, with only the power / data cable running outdoors to the DataHog2 / MiniMet2 datalogger. The GSM cellular modem is fitted inside the ModLink housing.

There are 3 connections on the back panel, two cables permanently attached plus a small socket.

The small socket is the power supply connection. Plug the mains power supply connector into this socket.

The two permanently connected cables are carefully labeled. The cable marked AERIAL is already attached to the GSM cellular aerial. Place the aerial in a suitable position as to receive the best network signal (e.g. use a standard handset phone using the same network provider to assess the maximum signal position).

The cable marked LOGGER connects to the DataHog / MiniMet datalogger and is fitted with a round 8 pin plug. Fit the plug into the RS232 socket of the DataHog2 or MiniMet2 logger. If this means running a length of cable outdoors, make sure the cable is protected from chafing by movement and / or has a protective covering such as conduit to eliminate damage.

There is also a small black button at the rear of the MOD1 ModLink unit. This is the PSU RESET or Power Supply Unit Reset button for the datalogger itself. It is only necessary to depress this button momentarily if there has been a power interruption to the logger, such as a change of batteries or power cut. The PSU reset button is used to restart the system after power loss.

NOTE it is important that flat or exhausted batteries are not left inside the datalogger as flat batteries leak corrosive chemicals which cause serious and permanent damage to the logger.

3. INITIAL SET UP

3.1 MOD1 ModLink

Connect the external modem, the ModLink unit and DataHog2 or MiniMet2 datalogger together as described in Chapter 2.

Connect and switch on the mains power supply to the ModLink. The red LED on the front panel will light to indicate power on.

Switch on the mains power supply to the external modem. If present, move the ON/OFF switch on the modem to the ON position. It is important to note that most modems require the power switch to be used in power up, to initiate the correct internal reset sequence for the modem. Connect to your phone line.

Inside the datalogger battery housing, press the PSU Reset button to initiate power to the datalogger. The system is now operational and ready to be accessed remotely at any time.

If possible, test and get used to the system while you are at the remote end (i.e. the end with the datalogger and ModLink unit!) This way it will save time and trouble. Even using a non-data mobile phone or landline handset will show that your new modem is answering even though a connection for data is not possible.

When a successful connection is made, the green light on the front of the ModLink will light. The green light will go out when the call is disconnected.

3.2 MOD2 ModLink

Connect the external modem, the ModLink unit and the Mains Hog or Mains Hog with Signal Boosters power supply as described in Chapter 2.

Connect and switch on the mains power supply to the ModLink. The red LED on the front panel will light to indicate power on.

Switch on the mains power supply to the external modem. If present, move the ON/OFF switch on the modem to the ON position. It is important to note that most modems require the power switch to be used in power up, to initiate the correct internal reset sequence for the modem. Connect to your phone line.

Ensure mains power to Mains Hog / Mains Hog with Signal Boosters is switched on.

Press the PSU Reset button on Mains Hog or Mains Hog with Signal Boosters.

The system is now operational and ready to access remotely at any time.

If possible, test and get used to the system while you are at the remote end (i.e. the end with the datalogger and ModLink unit!) This way it will save time and trouble. Even using a non-data mobile phone or landline handset will show that your new modem is answering even though a connection for data is not possible.

When a successful connection is made, the green light on the front of the ModLink will light. The green light will go out when the call is disconnected.

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3.3 MOD3 ModLink

The MOD3 ModLink contains a GSM cellular modem. If purchased from Skye then a Siemens TC35i modem will have already been installed inside the MOD3.

The GSM cellular modem requires a SIM card with a DATA airtime contact to a local network supplier to operate. If arranged by Skye, the SIM card will have already been installed inside the Siemens mode m.

If you have arranged your own SIM card, it is advisable to first put this card in a standard mobilephone and switch off all options to enter PIN and PUK numbers, and cancel all “divert call” options.

On the ModLink, ensure that the power is off and unscrew the 2 screws from the base which hold together the two halves of the case. Separate the two halves of the case and lift out the back plate.

The Siemens TC35I cellular modem is a black box near the back of the ModLink. There is a small section marked SIM and a yellow dot on the side of the black box nearest the back of the ModLink. Press the yellow dot with a ballpoint pen and the section marked SIM will pop out to reveal a tray. Place the SIM card in this tray - it will only go in one way - and push to close.

Replace the back plate into the base of the ModLink case, place the two halves together and screw up.

Connect the ModLink to the PC and position the aerial as described in Chapter 2.

Connect and switch on the mains power supply to the ModLink. The red LED on the front panel will light to indicate power on.

It is advisable to make a simple test before trying a connection to the datalogger.. See Appendix 2 for instructions to test via Windows HyperTerminal. Type the number of a telephone nearby which you will be able to hear ringing.

When the connection is made and you hear the telephone ring, the green light on the front of the ModLink will light. The green light will go out when the call is disconnected.

The system is now operational and ready to access the remote datalogger at any time.

3.4 MOD4 ModLink

The MOD4 ModLink contains a GSM cellular modem. If purchased from Skye then a Siemens TC35i modem will have already been installed inside the MOD4.

The GSM cellular modem requires a SIM card with a DATA airtime contact to a local network supplier to operate. If arranged by Skye, the SIM card will have already been installed inside the Siemens mode m.

If you have arranged your own SIM card, it is advisable to first put this card in a standard mobilephone and switch off all options to enter PIN and PUK numbers, and cancel all “divert call” options.

On the ModLink, ensure that the power is off and unscrew the 2 screws from the base which hold together the two halves of the case. Separate the two halves of the case and lift out the back plate.

The Siemens TC35I cellular modem is a black box near the back of the ModLink. There is a small section marked SIM and a yellow dot on the side of the black box nearest the back of the ModLink. Press the yellow dot with a ballpoint pen and the section marked SIM will pop out to reveal a tray. Place the SIM card in this tray - it will only go in one way - and push to close.

Replace the back plate into the base of the ModLink case, place the two halves together and screw up.

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Connect the ModLink unit and DataHog2 or MiniMet2 datalogger together as described in Chapter 2.

Connect and switch on the mains power supply to the ModLink. The red LED on the front panel will light to indicate power on.

(The very first time power is switched on, the green light on the front panel will come on and stay on. After the modem has made a call the green light will go out when the call is disconnected. Afterwards the green light will only come on when a call is being made.)

Inside the datalogger battery housing, press the PSU Reset button to initiate power to the datalogger. The system is now operational and ready to be accessed remotely at any time.

If possible, test and get used to the system while you are at the remote end (i.e. the end with the datalogger and ModLink unit!) This way it will save time and trouble. Even using a non-data mobile phone or landline handset will show that your new modem is answering even though a connection for data is not possible.

When a successful connection is made, the green light on the front of the ModLink will light. The green light will go out when the call is disconnected.

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4. OPERATION

If not using MOD3 ModLink, the PC which will be remotely accessing the DataHog2 or MiniMet2 logger should be installed with a good quality, hardware modem - NOT a budget software modem as these can be unreliable for error free data transmission and regular connections.

The PC should also have a communications software installed, this may be SkyeLynx Deluxe, SkyeLynx Auto, WizzCom, Windows HyperTerminal or your own software.

Program the telephone number of the datalogger site into the communications software. Please follow the program's individual instructions.

Dial the location and listen carefully to the modem sounds, ideally you will hear the beeps and whistles similar to a fax machine or connecting to the internet.

When a remote connection is made, the green LED on the front panel of the ModLink housing will light.

The ModLink unit is designed to negotiate an error correcting link between its modem and the PC modem, to ensure trouble free transfer of data. Such a link is not always possible especially if the network is busy and occasionally an error message such as NO CARRIER, NO CONNECTION or similar may appear. In this case simply try again and as soon as the correct protocol is agreed by the modems you should have no further problem in making a connection.

If purchased directly from Skye, the modem supplied with the ModLink is programmed to make only an error corrected connection or none at all.

When a successful connection has been made, you should see a regular message appearing in the main screen of your communications software

ANY KEY TO PROCEED.....

or

ANY NUMERIC KEY TO WAKE-UP (!0 TO 9!)
(TIME) (DATE) (DATA)

This message is coming from the logger itself. Once this message appears regularly, you may proceed to download data, view live data etc. as you wish. Please see your program's individual instructions for details.

5. TROUBLESHOOTING

If you have problems obtaining a logger connection, please check the following points.

A. MODEM CONNECTION MADE BUT NO RESPONSE FROM DATALOGGER:

1. Check power to the DataHog2 or MiniMet2 datalogger - this may be internal batteries, solar power or mains power as appropriate.
2. Momentarily depress the small black button PSU RESET on the back panel of the MOD 1 ModLink, or the red PSU RESET button on the Mains Hog or Mains Hog with Signal Boosters.

B. NO CONNECTION TO MODEM

1. Is your PC able to make other modem connections, e.g. to the internet or emails?
2. Check power to the ModLink- is the red LED lit?
3. Check the power supply to the external modem (connected to the ModLink), is the modem switched on?
4. Try switching off power to the ModLink and its external modem. Also switch off the ON/OFF button on the modem if present. Then again turn on mains power to the ModLink. Turn on mains power to the modem. Turn on ON/OFF switch on modem itself. TURNING ON IN THIS ORDER IS IMPORTANT ON SOME MAKES OF EXTERNAL MODEMS.
5. If you can ring the ModLink/modem with a mobile phone/BT handset and it will answer, then perhaps the problem lies with the modem in your PC. It must be able to make an error corrected link (default settings on most modems will enable this), but some 'soft modems', USB modems etc. have difficulty with this sort of call. (they are optimised for internet connections). If possible, try a different modem and/or PC to make the connection to your ModLink/modem.
6. Test the modem as described in Appendix 2.

APPENDIX 1 - Programming a Modem

If you have purchased the ModLink plus modem directly from Skye, then we will have already programmed the modem ready for use.

If you have purchased the modem yourself, please follow these guidelines for programming it to ensure correct operation. The examples shown are for programming a US Robotics 56K modem, however it is important that you check your own modem manual for the precise settings as they may not be exactly the same.

1. Program the modem to auto answer a call
e.g. Set the S register to a value greater than 0, such as `ATS0=2`
2. The modem **MUST** have a serial port baud rate of 9600 at all times when communicating with the DataHog logger. In some modems the serial rate is tied to the line rate, but not in all models. Ideally it can be fixed to a stated rate.
e.g. `atbx` (where x is a number, usually 0,1,2 etc)

N.B. Some modems may adjust this serial port rate automatically, occasionally this facility may fail resulting in a lost connection.

3. The line speed should be equal to or greater than the serial port baud rate. Some modems require the line rate and serial rate to be equal. i.e. it should be 9600 or more.
4. Local echo must be switched off.
e.g. `ate0`
5. Messages and error codes must be switched off
e.g. `atqx` (where x is a number 0,1,2 etc)
6. Regarding the control lines from the modem RS232 port.
DTR must be overridden i.e. must not be used for control
DCD use normal operation according to connection state
DCR use normal operation according to connection state

Your modem should have an 'AT' command for controlling the activities of each of these lines.

7. The modem must be forced into an error corrected mode. If possible use a compressed mode also.
e.g. `at+mx` (where x is a number 0,1,2 etc)

The calling modem should be set to connect only with error correction and this is usually sufficient. However it is wise to set both modems for error corrected links only.

NON ERROR CORRECTED LINKS MUST NOT BE ALLOWED TO CONNECT, ELSE CORRUPTION OF DATA WILL OCCUR

8. The modem must switch on and automatically initialise the above settings. These settings must be stored in the modem's non-volatile memory and automatically load these settings at start up. Typically the modem will have a non volatile store usually referred to as Y0, sometimes two stores, Y0 and Y1. Be sure that one of these stores is programmed as outlined above and set to be loaded at power up of the modem.

9. Beware, some modems we have seen require the power switch on the modem to be used to power up the unit. Simply leaving this switch on and plugging in the mains 'wall cube' or switching on the wall socket does not initialise the modem correctly.

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Example of modem settings for a US Robotics 56K modem

U.S. Robotics 56K FAX EXT NVRAM Settings...

Template Y0

DIAL=TONE B0 E1 F1 L2 M1 Q1 V1 X4
SPEED=9600 PARITY=N WORDLEN=8

&A1 &B1 &C1 &D0 &H0 &I0 &K1 &M5 &N0
&P0 &R1 &S1 &T5 &U0 &Y0

S00=002 S02=043 S03=013 S04=010 S05=008 S06=004 S07=060
S08=002 S09=006 S10=014 S11=072 S12=050 S13=000 S15=000
S19=000 S21=010 S22=017 S23=019 S25=005 S27=001 S28=008
S29=020 S30=000 S31=128 S32=002 S33=000 S34=000 S35=000
S36=014 S38=000 S39=012 S40=000 S41=004 S42=000

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APPENDIX 2 - TESTING A MODEM CONNECTION

In Microsoft Windows, click on START, PROGRAM, ACCESSORIES, COMMUNICATIONS, HYPERTERMINAL.

Firstly, you need to set up an icon to use in future, so enter an icon name in the box, e.g. ModLink. Choose an icon you wish to use from those displayed by clicking on it and click OK

On the screen headed "Connect to", in the "Connect Using" box choose COM1 (or whichever serial port your ModLink is connected to). Click OK.

On the next screen enter the following values:

Bits per second	9600
Data bits	8
Parity	None
Stop bits	1
Flow Control	Xon / Xoff

Click OK.

In the main white terminal screen, type "at" and press Enter. A reply of "OK" should come up.

Now type "atdt" plus the telephone number you wish to test and press enter.

To disconnect the call, type "+++", wait 1 second then type "ath" and press Enter.