



**Siemens TC35iT  
Installation & Programming  
Manual**

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# TC35iT Installation & Programming Manual

## 1) INTRODUCTION

This manual gives instructions to distributors who are purchasing a GSM module from Skye, and fitting the Siemens TC35iT module themselves.

However, if you have purchased the TC35iT from Skye we will have already installed it in its housing however it is possible that you may have to reprogram the modem for your own local GSM network.

The Siemens TC35iT modem is dual band for use with a 900 or 1800 MHz GSM cellular telephone system only. An airtime contract and SIM card must be obtained from the mobile phone network provider. This can be a standard "Voice" contract with a Data number added, or some network providers offer a "Data only" contract. You need the Data "telephone" number to dial up the MiniMet weather station. The Voice telephone number will not work.

When requesting the Data number from the network provider, please ask for:

1. Circuit Switched data number (modem type connection)
2. 9600 bps
3. 8 data bits, No Parity bits, 1 Stop Bit
4. Non-Transparency enabled (also known as error corrected or "RLP")

Connection to the remote MiniMet or DataHog logger can be made from the office PC which is fitted either with a standard modem connected to the PSTN telephone line or via a second TC35iT cellular modem and SIM card using the Skye MOD3 unit. Please see the Chapters 3.1 and 3.2 for setting up these two options.

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### **2. INSTALLING THE SIEMENS TC35iT MODEM**

This chapter refers to the remote MiniMet or DataHog GSM housing enclosure (with the green label).

Make sure no power is available to the GSM Modem Unit before proceeding.

Remove the lid from the Skye GSM Modem Unit by unscrewing the 4 corner screws.

The Siemens TC35iT is supplied with a short aerial lead and connector only. It has 2 mounting holes which can be used to fix it to the aluminium mounting plate inside the Skye GSM Modem Unit. See Figure 1.

There are 2 sockets on the TC35iT. The Skye GSM Modem Unit has a grey 9 pin D connector and a small clear connector with 6 gold contacts which match these sockets. Push the clear connector into its socket, connect the grey D connector and screw up to secure.

Before connecting the aerial remember to feed the aerial cable through the cable gland in the base of the GSM Modem Unit. See Figure 2. Screw together the 2 aerial connectors and make the excess cable tidy. Tighten the cable gland over the 'built up' portion of the aerial cable to make a waterproof seal.

To install the airtime contract SIM card, locate the small black tray marked SIM on the side of the TC35iT itself. Push the little yellow button beside it to release the tray, insert the SIM card (it will only go in one way) and replace the tray, pushing fully home.

**NOTE:** before installing the SIM card it is a good idea to insert it into a hand phone to check its functionality. You may need to switch off the PIN code request function, we would also recommend switching off all divert calls (e.g. divert to voice mail if not answered etc).

The TC35iT then requires programming before use (see below).

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## 3. PROGRAMMING THE TC35iT MODEM

It is necessary to change the factory settings of the Siemens TC35iT modem suitable for communication with the DataHog or MiniMet logger. When the TC35iT is purchased through Skye, we will have already done this initial programming for you (the default setting is described in Chapter 3.1 for use with a standard PSTN telephone line).

However in some countries we have found that one or two settings are slightly different to those used in the UK, so you may have to change these. You may need to seek advice from either a local Siemens dealer, or the GSM network provider technical department, who should be able to advise on different programming settings for your own country.

Programming the TC35iT is very easy and full instructions are given below. You will need the special 'Modem Programming' cable (see Appendix 2 for details), the Skye GSM Modem Unit, an aerial and a 12V battery or 12V power supply.

### 3.1 Using a standard PSTN telephone line at the PC end

In this case you will have just one Siemens TC35iT modem, fitted into the GSM Modem Unit housing, which will be installed on the MiniMet mast.

The office PC which will dial up the station must also have a modem connection. This must be a standard analogue fax / modem (internal or external to the PC) connected to an analogue standard PSTN telephone line. An ISDN digital telephone line will not work.

**PLEASE FOLLOW THESE INSTRUCTIONS IN ORDER, CAREFULLY. IF POWER IS APPLIED TO THE TC35iT UNIT BEFORE OTHER CONNECTIONS ARE MADE, THE MODEM CAN BE PERMANENTLY DAMAGED.**

1. Disconnect the grey 9 pin D connector from the GSM Modem Unit to the TC35iT. Replace this with the male end of the Skye 'TC35iT programmer' cable. Connect the female end to a serial port of a PC.
2. Make sure the aerial is fitted to the TC35iT.
3. Connect a 12V battery (or power supply) to the GSM Module Unit using the red and black 'spade' connectors fitted to the thick white cable exiting the base of the housing. At this point the red LED marked MODEM ACTIVE WHEN LIT should come on (in the bottom right hand side of the PCB).

Start Windows HyperTerminal on the PC. To begin communications, configure the appropriate Comm Port and use the settings 9600 baud rate, no handshake, no parity, 1 stop bit. If you are unfamiliar with HyperTerminal please see Appendix 1.

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Follow these instructions for the programming sequence:

1. Type **at** and press return. **OK** should come back.

(NOTE – if the TC35iT has already been programmed by Skye, you may not see the **OK** come back. In this case type **ate1** and press return. Then type **atq0** and press return. Now try typing **at** again and press return. **OK** should come back.)

2. Type **at&f** and press return. **OK** should come back.
3. Type **ats0=2** and press return.
4. Type **ats7=90** and press return.
5. Type **ats10=200** and press return.
6. Type **at&cl** and press return.
7. Type **at&d0** and press return.
8. Type **at&sl** and press return.
9. Type **at%~~d~~0** and press return.
10. Type **at+icf=3** and press return.
11. Type **at+ifc=2,2** and press return.
12. Type **at+ipr=9600** and press return.
13. Type **at+cbst=7,0,1** and press return.
14. Type **atq1** and press return.
15. Type **ate0** and press return.
16. Type **at&w0** and press return.
17. Type **at&v** and press return. The modems settings are displayed.
18. Check to see that the changes you have entered are all there. There will also be other settings which you have not changed.

To check the TC35iT is correctly set up, make a call from it through the PC (if an airtime contract barring outward calls is in place, this may not be possible). To do this type **atdt** then the telephone number, then press return. You will see the message **CONNECT 9600** on the screen if successful. Try to ring a telephone nearby so that you can hear it ring and answer it! To hang up, type **\*\*\*ath** and press enter.

**IMPORTANT** - it is important to switch off the power to the TC35iT before disconnecting any other cables, to prevent damage. When power has been removed the red LED 'Modem Active' light will go off.

Disconnect the 'TC35iT programmer' cable from the PC and TC35iT. Reconnect the grey 9 pin D connector between the GSM Modem Unit and the TC35iT.

Replace the housing's lid, taking care not to damage the rubber 'O' ring seal.

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### 3.2 Using a second TC35iT cellular modem at the PC end

In this case you will have two Siemens TC35iT modems, one fitted into the GSM Modem Unit housing which will be installed on the MiniMet mast, plus a second which will be with the non waterproof MOD3 unit next to the PC.

The programming requirements are different for each modem, please see below. Use the remote GSM Modem Unit to power and program each modem in turn, using the instructions below.

**PLEASE FOLLOW THESE INSTRUCTIONS IN ORDER, CAREFULLY. IF POWER IS APPLIED TO THE TC35iT UNIT BEFORE OTHER CONNECTIONS ARE MADE, THE MODEM CAN BE PERMANENTLY DAMAGED.**

#### 3.2.1 Programming the TC35iT for the Datalogger site

1. Disconnect the grey 9 pin D connector from the GSM Modem Unit to the TC35iT. Replace this with the male end of the Skye 'TC35iT programmer' cable. Connect the female end to a serial port of a PC.
2. Make sure the aerial is fitted to the TC35iT.
3. Connect a 12V battery (or power supply) to the GSM Module Unit using the red and black 'spade' connectors fitted to the thick white cable exiting the base of the housing. At this point the red LED marked MODEM ACTIVE WHEN LIT should come on (in the bottom right hand side of the PCB).

Start Windows HyperTerminal on the PC. To begin communications, configure the appropriate Comm Port and use the settings 9600 baud rate, no handshake, no parity, 1 stop bit. If you are unfamiliar with HyperTerminal please see Appendix 1.

Follow these instructions for the programming sequence:

1. Type **at** and press return. **OK** should come back.

(NOTE – if the TC35iT has already been programmed by Skye, you may not see the **OK** come back. In this case type **at+e1** and press return. Then type **atq0** and press return. Now try typing **at** again and press return. **OK** should come back.)

2. Type **at+f** and press return. **OK** should come back.
3. Type **ats0=2** and press return.
4. Type **ats7=90** and press return.
5. Type **ats10=200** and press return.
6. Type **at+c1** and press return.
7. Type **at+d0** and press return.

8. Type **at&sl** and press return.

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9. Type **at%d0** and press return.
10. Type **at+icf=3** and press return.
11. Type **at+ifc=2,2** and press return.
12. Type **at+ipr=9600** and press return.
13. Type **at+cbst=71,0,1** and press return.
14. Type **atq1** and press return.
15. Type **ate0** and press return.
16. Type **at&w0** and press return.
17. Type **at&v** and press return. The modems settings are displayed.
18. Check to see that the changes you have entered are all there. There will also be other settings which you have not changed.

To check the TC35iT is correctly set up, make a call from it through the PC (if an airtime contract barring outward calls is in place, this may not be possible). To do this type **atdt** then the telephone number, then press return. You will see the message **CONNECT 9600** on the screen if successful. Try to ring a telephone nearby so that you can hear it ring and answer it! To hang up, type **\*\*\*ath** and press enter.

**IMPORTANT** - it is important to switch off the power to the TC35iT before disconnecting any other cables, to prevent damage. When power has been removed the red LED 'Modem Active' light will go off.

Disconnect the 'TC35iT programmer' cable from the PC and TC35iT.

To reinstall the modem in the GSM Modem Unit remote housing, reconnect the internal grey 9 pin D connector. Replace the housing's lid, taking care not to damage the rubber 'O' ring seal.

To reinstall the modem in the MOD3 unit, remove from the GSM Modem Unit remote housing, install in the MOD3 housing and reconnect the internal grey 9 pin D connector.

### 3.2.2 Programming the TC35iT for the PC

1. Just for the purpose of programming, connect the TC35iT which is to be used with the PC to the GSM Modem Unit as in 3.2.1 above.
2. Connect the male end of the Skye 'TC35iT programmer' cable to the TC35iT. Connect the female end to a serial port of a PC.
3. Make sure the aerial is fitted to the TC35iT.
4. Connect a 12V battery (or power supply) to the GSM Module Unit using the red and black 'spade' connectors fitted to the thick white cable exiting the base of the housing. At this point the red LED marked **MODEM ACTIVE WHEN LIT** should come on (in the bottom right hand side of the PCB).

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Start Windows HyperTerminal on the PC. To begin communications, configure the appropriate Comm Port and use the settings 9600 baud rate, no handshake, no parity, 1 stop bit. If you are unfamiliar with HyperTerminal please see Appendix 1.

Follow these instructions for the programming sequence:

1. Type **at** and press return. **OK** should come back.

(NOTE – if the TC35iT has already been programmed by Skye, you may not see the **OK** come back. In this case type **ate1** and press return. Then type **atq0** and press return. Now try typing **at** again and press return. **OK** should come back.)

2. Type **at&f** and press return. **OK** should come back.
3. Type **at+cbst=71,0,1** and press return.
4. Type **at&w0** and press return.
5. Type **at&v** and press return. The modems settings are displayed.
6. Check to see that the changes you have entered are all there. There will also be other settings which you have not changed.

To check the TC35iT is correctly set up, make a call from it through the PC (if an airtime contract barring outward calls is in place, this may not be possible). To do this type **atdt** then the telephone number, then press return. You will see the message **CONNECT 9600** on the screen if successful. Try to ring a telephone nearby so that you can hear it ring and answer it! To hang up, type **\*\*\*ath** and press enter.

**IMPORTANT** - it is important to switch off the power to the TC35iT before disconnecting any other cables, to prevent damage. When power has been removed the red LED 'Modem Active' light will go off.

Disconnect the 'TC35iT programmer' cable from the PC and TC35iT. Connect this TC35iT to the PC as required. Replace the datalogger site TC35iT in the GSM Housing Unit as described in 3.2.1.

### 3.3 Notes on TC35iT modem programming

The above settings have been tested on UK networks only.

There is only one difference between the datalogger modem programme in Chapters 3.1 and 3.2, that is instruction 13. The command **at+cbst** defines the type of modem connection as follows:

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**at+cbst=0,0,1 autobauding**

**(for connecting an analogue modem or a TC35iT at PC end to the TC35iT modem at the MiniMet end)**

**at+cbst=7,0,1 instructs a V32 analogue modem connection @ 9600 baud**

**(for connecting an analogue modem at PC end to the TC35iT modem at the MiniMet end)**

**at+cbst=71,0,1 instructs a V110 digital modem connection @ 9600 baud**

**(for connecting a TC35iT modem at PC end to the TC35iT modem at the MiniMet end)**

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### **4. MODES OF OPERATION**

The standard mode for operation of the GSM Modem Unit is for the modem to be powered and on 'standby' to receive a call 24 hours a day.

There are some 'jumpers' on the electronics board which can change this mode of operation, normally they will not need to be changed but it would be good to be aware of them.

See Figure 1 and Figure 3 showing the layout of the inside of the GSM Modem Unit. Just above the red LED light which indicates whether the modem is active, there are a pair of jumpers marked L12 and L13.

If there is a small black connector across the two pins of L13, then the system will operate in standard mode and will power the modem 24 hours a day.

If there is a small black connector across the two pins of L12, then the system will never power up the modem, this is a permanently OFF position, used for servicing etc.

If there is no connector across either L12 or L13 then the 'telephone pager activator' function is in operation. The buttons in the centre of the electronics board, blue to Start and red to Cancel, will activate the modem for the time period set by the 'Pager 'on' / Test period link settings' – see Figure 1, Figure 3 and also the GSM TC35iT Modem Unit manual.

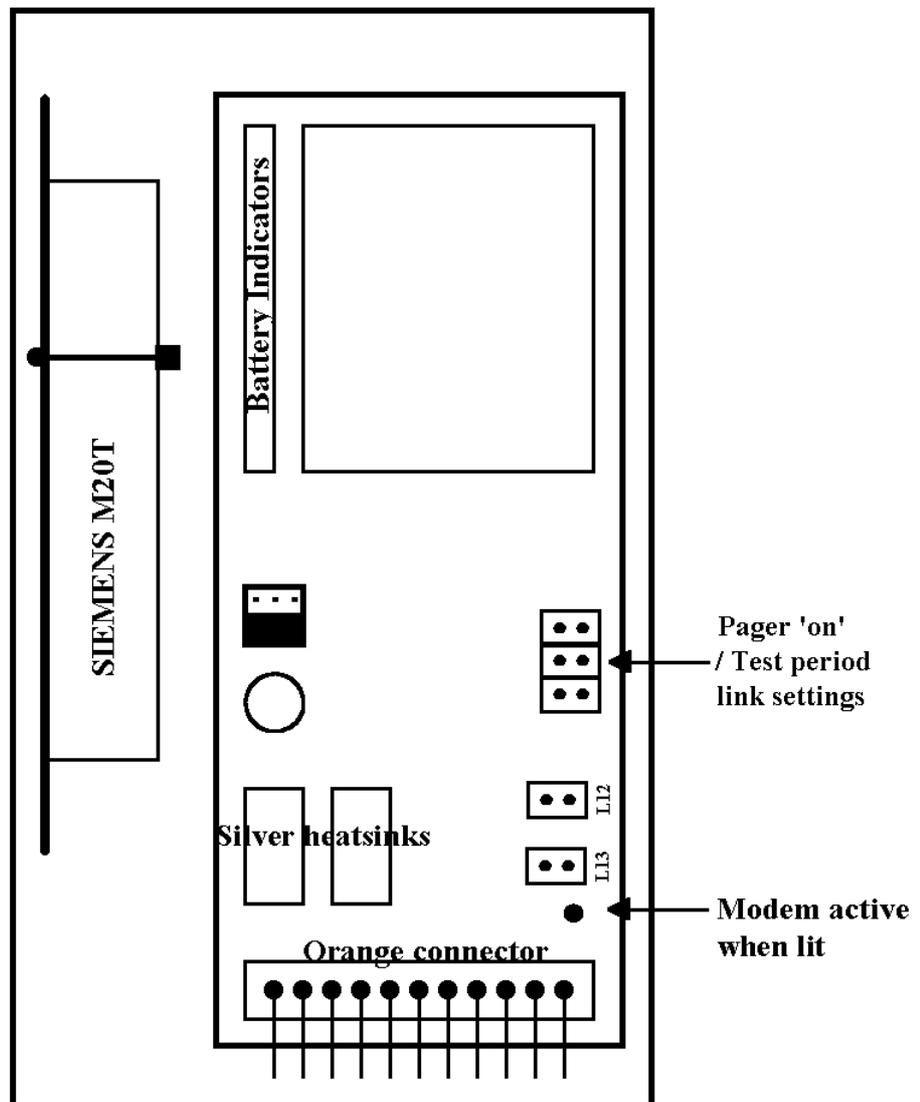
The 'telephone pager activator' option is only available in the UK at the moment. If you are able to locally source a standard numeric telephone pager, which is powered by a single 1.5V battery, then it may be possible to use this option in your own country. Please contact Skye for details.

When the red LED 'modem active' is lit, then power is being applied to the TC35iT modem and the green LED on the modem itself should flash slowly, about 1 flash per second. When a call is being connected to the modem, this green LED will flash much faster. It will return to the slow flash as soon as the call is finished.

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**FIGURE 1**

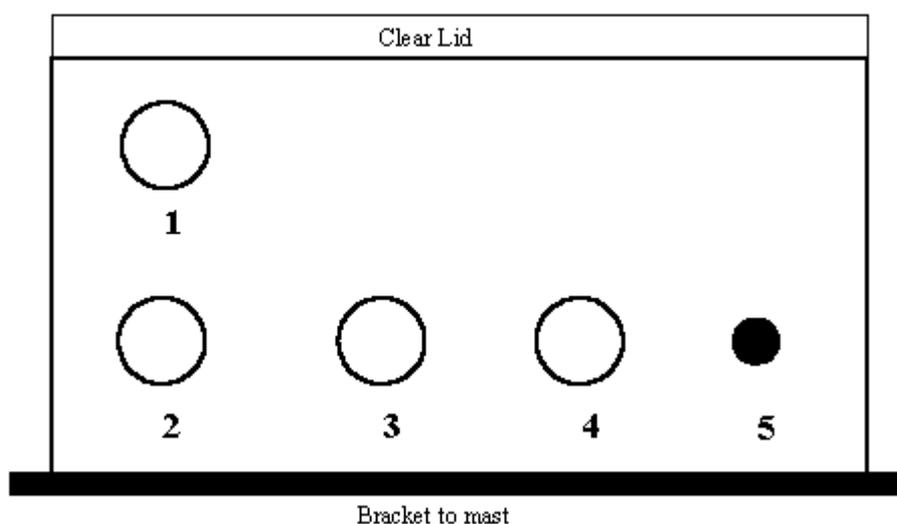
**Inside the GSM Modem Unit**



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**FIGURE 2**

### **Cable Entries on base of GSM Modem Unit**



**Port 1 – aerial cable**

**Port 2 – RS232 cable to DataHog**

**Port 3 – solar panel cable (where not used, this will be fitted with a blanking plug)**

**Port 4 – battery cable**

**Button 5 – push button for 12V battery test**

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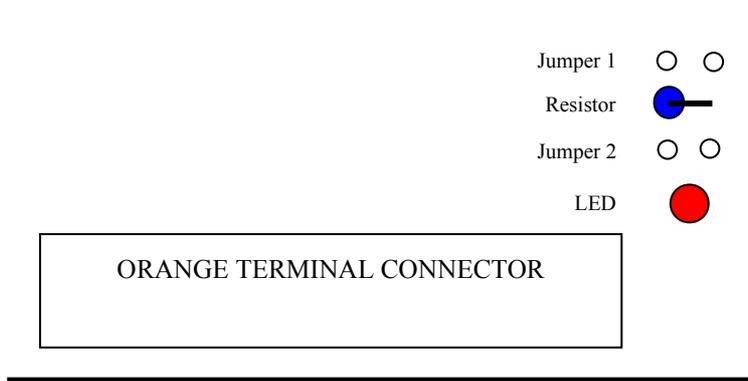
**FIGURE 3**

**Modem Power Control**

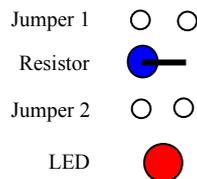
The GSM Housing box encloses the GSM modem itself, plus electronics for controlling the modem, the power supply and solar power regulator.

There are 'power on' options for timed operation, permanently on or permanently off. These 3 options are controlled by a set of jumper pins on the PCB as shown below.

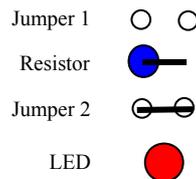
First locate the 2 sets of jumper pins just above the LED marked 'modem on when lit' in the bottom right hand corner of the box, next to the large orange terminal connector. There is a black jumper provided to enable a short across the jumper pins as required.



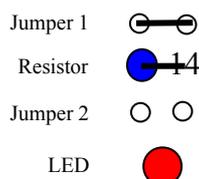
1. Power to the GSM modem is in **TIMER MODE** (available only when a pager or clock is fitted) when Jumper 1 or 2 are **NOT** shorted:



2. Power to the GSM modem is permanently **ON** when Jumper 2 is shorted:



3. Power to the GSM modem is permanently **OFF** when Jumper 1 is shorted:



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### APPENDIX 1 - Using Windows HyperTerminal

1. Click on **START, PROGRAM, ACCESSORIES, HYPERTERMINAL**
2. Double click on **HYPERTERMINAL.EXE**
3. Firstly, you need to set up an icon to use in future, so enter an icon name in the box, e.g. **TC35iT**
4. Choose an icon you wish to use from those displayed by clicking on it and click **OK**
5. A series of empty boxes are shown, ignore the first 3 boxes. In the box named **CONNECT USING**, click on the **DOWN** arrow to reveal a number of options. Choose **DIRECT TO COM1** (or **Direct to Com2** if using **ComPort2**). Click **OK**
6. In the next series of boxes, choose:

Bits per second **9600**  
Data bits           **8**  
Parity               **None**  
Stop bits            **1**  
Flow Control      **No handshake**

Click **OK**.

7. Click on **FILE** and **EXIT**. Click **YES** and **YES** again to save the settings you have chosen. Wait a few moments and you should see your chosen icon appear called **TC35iT**.

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## APPENDIX 2 - Wiring Details for Modem Programming Cable

2 metres of 2 core screened cable  
Attach grey wires to cable screen either end

