MANUAL

Welotech Router

Operating instructions for the interconnection of solar arrays and the Sunways-Portal

Inhaltsverzeichnis

1. Introduction

This documentation describes the interconnection of a solar inverter by a router including the opportunity of having remote access. This documentation refers to the devices of the manufacturer Welotec, in particular the types TK701U-232 as well as TK401G-232. Those types come with an Ethernet point where a solar inverter can be attached.

Please also adhere to the manual of the manufacturer. This document represents only hints for the regular configuration of the underlying product.

1.1. Product overview

The following products can be purchases via the Sunways AG :

Art. #	Name	Type	Description / content
SE167S20A	UMTS-Router	TK701U-232	Router for the usage within the UMTS standard, also possible for the usage of the GPRS standard. Including power supply, antenna and 5m of cable set.
SE168S20A	GPRS-Router	TK701G-232	Router fort he usage within the GPRS standard. Including power supply, antenna and 5m of cable set.

2. Installation remarks

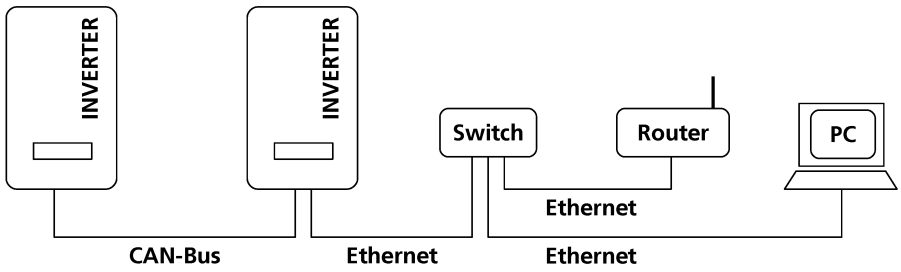
Please also adhere to the manual of the manufacturer!

Attention: The protection class of this device is confined to IP 30.

This router contains on it's backside a possibility for an interconnection with a cap rail. The voltage supply is 12-48V, an external power supply is included.

The connection of the external antenna is facilitated by the SMA-F connection on the router.

In order to facilitate both the access on the router and the solar inverter, the usage of a regular network switch device is recommended (see scheme below).

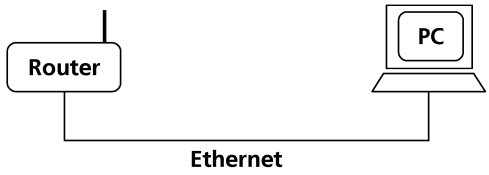


The router gets connected via „Ethernet" either on the switch or directly on the PC.

The master or slave solar inverter gets connected via "Ethernet " either on the switch or directly on the PC.

3. Operation set up

At first, the router has to be set-up via your web-browser on your computer. In order to do so, either connect your PC via Ethernet cable with your router or switch (see scheme above).



Your PC receives an IP address via DHCP automatically. In case of any issues, please check your network settings. You can reach your router by typing the address 192.168.2.1 into the address bar of your browser. The default settings are:

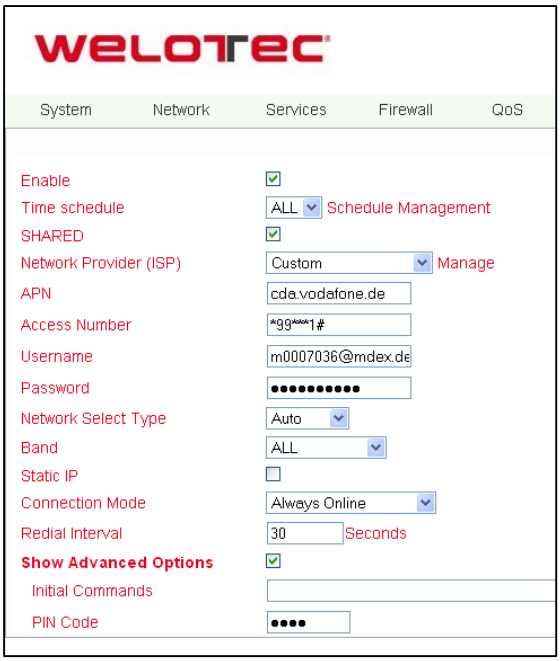
Login: **adm**
Password: **123456**

The set-up configuration of your router may require several steps, depending on your specific application. Merely for the connection to the Sunways Portal, without reaching the solar array from any other PC, please follow the steps in chapter 3.1. Anyway, if you want to access your solar array from any other PC (e.g. to reach the integrated Sunways Browser or to maintain software updates), please follow additionally the steps as described in chapter 3.3.

3.1. Set-up of the router

3.1.1. Set-up of the dial up parameters

This page can be found by selecting „Network – Dialup“.



Note: Please at first adjust the following parameters and then put in the SIM card and restart the router.
In the drop down list of the network provider (ISP) there are several default providers available. If your provider is available, the rest of the settings are confined to the entry of the PIN code of the SIM card. Therefore select „Show Advanced Options“.

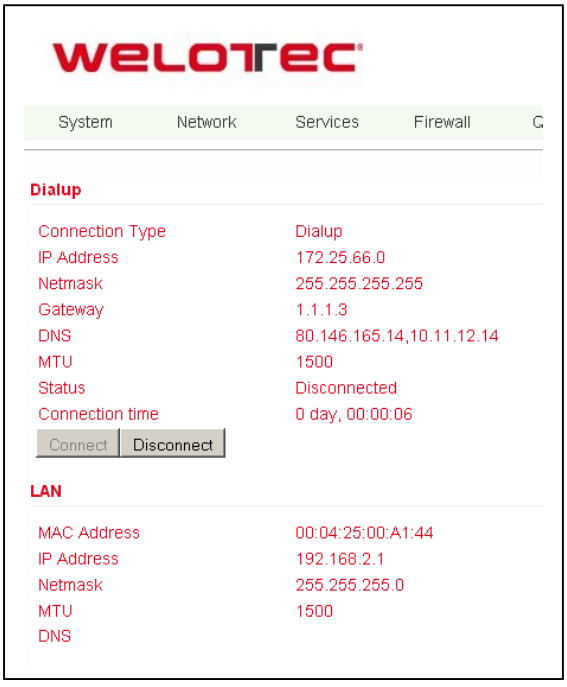
If your provider is not in the list or if you use MDEX, the configuration has to be executed manually. Therefore fill in the required data of the following areas:

- APN
- Access Number
- Login
- Password
- PIN Code of the SIM card

At last, the „connection mode“ has to be approved. If data package dependent connections of volume dependent tariffs are involved, the router can be set to the „always online“ mode. Thereby the router can be reached always from remote areas (if a power supply is connected). Now, the router can be restarted.

3.1.2. Starting up the connection

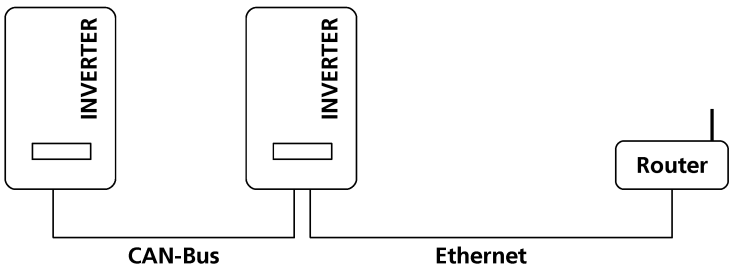
This page can be found by selecting „Status – Network Connections“.



By pressing the buttons „connect“ or „disconnect“ a connection to the ISP can be established or be broken up.

3.2. Set-up of the solar inverter

Via the display on the solar inverter, DHCP has to be activated. Therefore please log yourself in as administrator and use the standard password. Now select "Network – Ethernet". The solar inverter receives automatically it's network address and no further adjustments are necessary.



3.3. MDEX set-up of the router

If the connection to the MDEX service is preferred, the following settings are required.

Configuration of the Admin settings

This page can be found by selecting „System – Admin Access".

When the MDEX service is used, it is wise to displace the web-interface on another port for security matters. In the example, the web-server is configured via port #8080. In this case, a port forwarding to port #80 of the solar inverter is recommended. Thereby the website is shown if a user is connecting to the MDEX service.

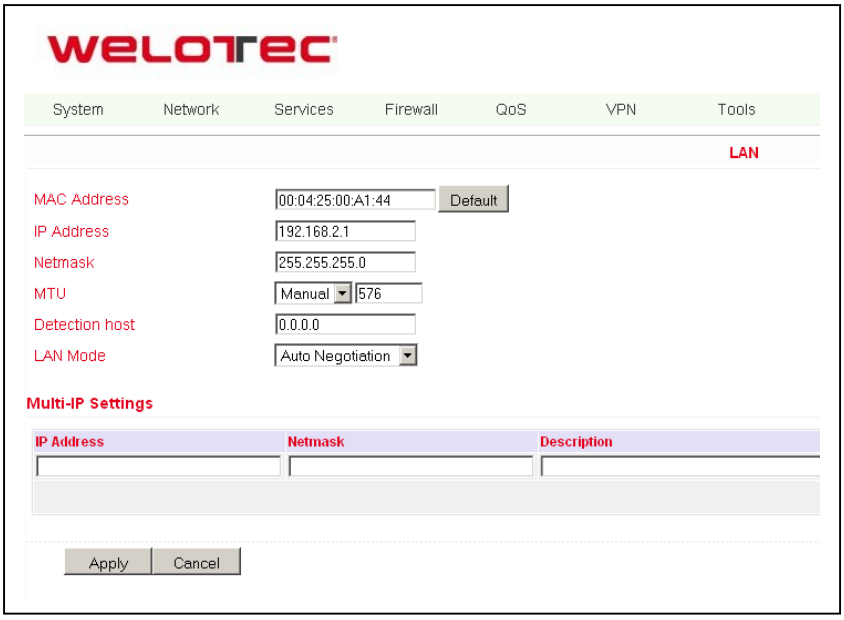
Note: For a later access to the web-interface of the router, the IP address 192.168.2.1:8080 has to be typed into the address bar of your browser.

This page can be found by selecting „Network – LAN".

It is also recommended to set-up the „Login Timeout" much higher. Thereby a frequently new login can be avoided.

3.3.1. Set-up of the LAN settings

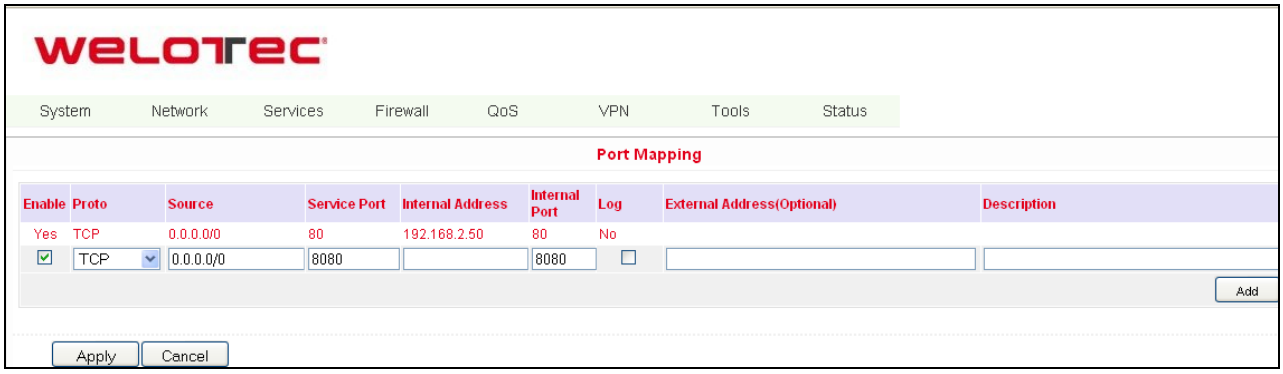
This page can be found by selecting „Network - LAN“.



For getting access to remote monitoring, the MTU default settings have to be adjusted manually to the value of **576**. Now, pressing the apply button saves all those parameters.

3.3.2. Configuration of the port forwarding

This page can be founf by selecting „Firewall – Port Mapping“.

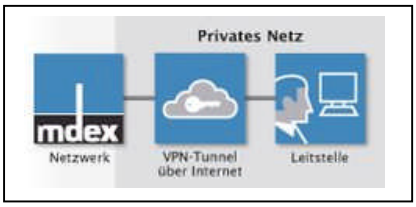


Port forwarding facilitates a remote access to the web server of the solar inverter via Internet. By accessing port #80 (usually port #80 is exclusively for the HTTP accesses to a web server) this access gets put through directly to the web server of the solar inverter. Therefore a particular inverter IP address (e.g. 192.168.2.50) has to be entered into the port mapping spreadsheet, like shown in the example above in line one.

4. Setting up the MDEX service

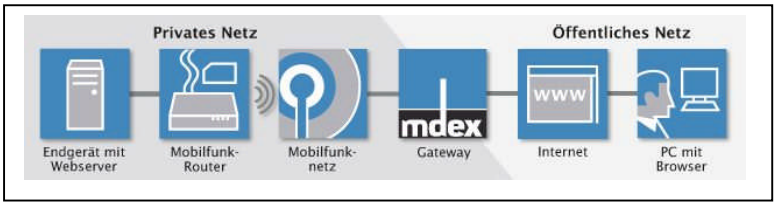
The service mdexfixed.IP facilitates via GPRS based mobile technologies (EDGE, UMTS, HSPA) to access remote devices like e.g. this router and therefore to access the connected solar inverters in the field. Such devices get a standard IP address to finally enable their access from any other PC or server, independent of their location. Their communication is taking place in a secure private IP network. Thereby an encrypted data transmission, either SSL (mdexweb.direct) or OpenVPN is possible.

4.1. Open VPN



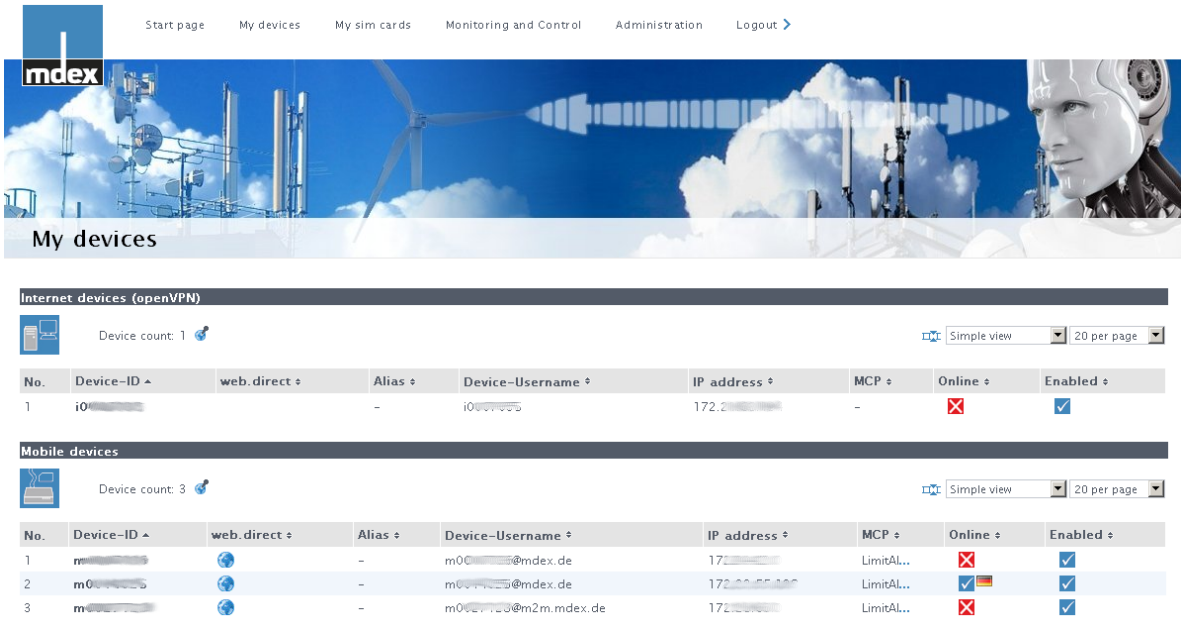
For the access from the control center, a secure VPN tunnel via the Internet is established. For this purpose, you get an OpenVPN client (software) for the installation on your PC or server. This modified mdexfixed.IP OpenVPN client serves as a virtual network connection via which all devices can be directly addressed with fixed IP addresses separately.

4.2. Mdexweb.direct



Likewise well known DynDNS services for conventional telephone networks, MDEX facilitates to reach m2m devices in mobile networks. The data service mdexweb.direct is a particular browser based access method for mobile devices which get connected via mdexfixed.IP with the MDEX net. mdexweb.direct enables a worldwide, secure and easy HTTP access to a mobile web-server via each and every internet access point via the web browser. By having individual direct links, either a router can be reached (e.g. for their set-up) or a network of other devices with integrated web servers can be accessed. It is not even necessary to install other additional software on the user computer.

MDEX provides a password secured user area on their web page. After the login, the user itself can set-up an own accesses for visualization purposes. Moreover, online devices can be detected easily.



By selecting links containing alias names a connection to the router on port #80 is opened. If other ports are requested, this can be executed (extended overview – Hostname) as follows: https://m0xxxxxx-p8080.webdirect.mdex.de whereby the extension -p8080 means access on port 8080. All required information for setting-up the Welotech router for a remote access via the MDEX service can be seen by pressing the button extended overview.