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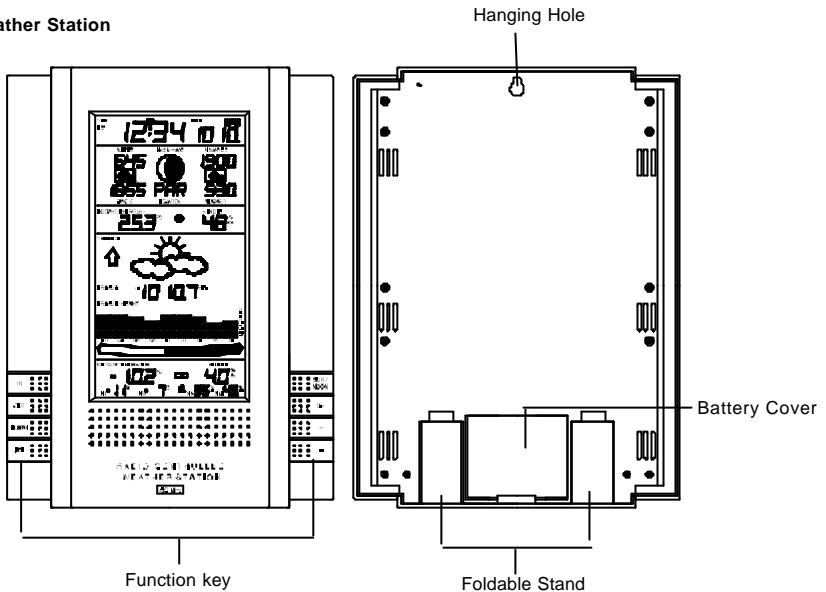
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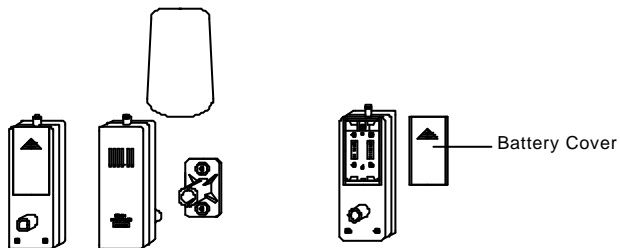
## 1. Introduction

Congratulations on purchasing this state-of-the-art Weather Station as an example of superior design and engineering. Providing radio controlled time, current temperature, humidity, moon phase, sunrise/set, moonrise/set, storm warning and air pressure display, this unit will never keep you guessing on current and future weather conditions. Operation of this product is simple and straightforward. By reading this operating manual, the user will however receive a better understanding of the Weather Station together with the optimum benefit of all its features.

### 1.1 Weather Station



### 1.2 Thermo Hygro Sensor



## 2 Features

### 2.1 Weather Station

- DCF-77 Radio controlled time display with manual settings option
- 12/24 time display
- Time zone selectable
- Calendar display
- Alarm setting with snooze function
- World cities location display
- Sunrise, sunset, sunlight duration display of selected world cities

- 12 Moon phases display throughout the month
- Moonrise and Moonset display of selected world cities
- Temperature display in degrees Celsius or Fahrenheit
- Display of current indoor temperature with MIN/MAX recordings
- Display of current indoor relative humidity with MIN/MAX recordings
- “☺” Smiling or “☹” sad face icon display for comfort level reading
- Three weather icons for weather forecasting
- Weather tendency indicators
- Storm warning
- Storm alarm
- Outdoor temperature alarm
- Graphic display of air pressure history for the past 30 hours
- Display of Absolute/Relative air pressure in hPa
- Air pressure tendency for the last 2 hours
- Display of current outdoor temperature with MIN/MAX recordings
- Display of current outdoor relative humidity with MIN/MAX recordings
- LCD contrast changeable to 16 different tones
- Can take up to three Thermo-hygro transmitters
- Low battery indicator
- Wall mounting or table standing

## 2.2 Thermo Hygro Sensor

- 868MHz remote transmission of outdoor temperature and humidity to the Weather Station
- Transmission of temperature and humidity changes
- Rain proof casing
- Simple mounting

## 3 Getting started

Remove all parts from the packaging and place onto a table in front of you. Ensure that the following parts are included:

1. Weather Station
2. Thermo Hygro Sensor with wall mounting bracket and two mounting screws (up to three sensors possible)
3. Rain Protector for Thermo Hygro Sensor
4. Operating Manual

If any one of the above mentioned parts is missing please contact your supplier.

Please follow all further explanations and descriptions in this manual in order to ensure that your new Weather Station works correctly together with the Thermo Hygro Sensor.

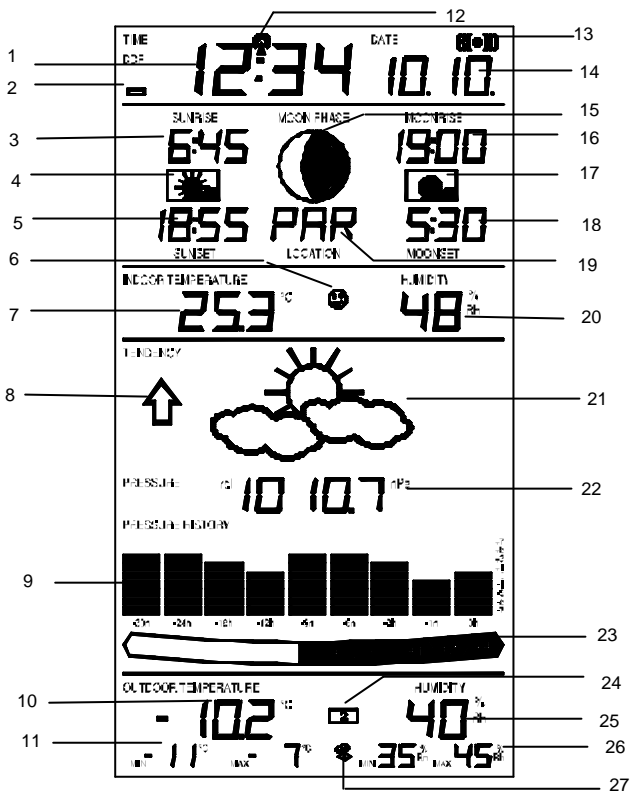
### Important Note:

**For all users wanting to get additional informations on the function of the Weather Station there is an numerically sorted subject index at the end of this manual offering a number of technical and functional explanations. For use and operation of this product however the knowledge of this index is not necessary.**

**All subjects listed in the subject index are marked by an index sign <sup>Sxj</sup> on their respective positions in this manual.**

## 4 LCD Screen

The large LCD display of your remote controlled Weather Station is for better distinction separated into five sections. These display sections will provide the information given in following list. For a more detailed description of the functions please see Items 4.1 thru 4.5 in this manual.



1. DCF-77 Radio controlled time
2. Low battery indicator
3. Sunrise and sun duration time display
4. Sunrise/sunset icon
5. Sunset display
6. "☺" smiling or "☹" sad face icon display for comfort level reading
7. Display of current indoor temperature with min and max recordings
8. Weather tendency indicator
9. Air pressure history for the past 30 hours in hPa
10. Outdoor temperature display
11. Display of outdoor temperature with min and max recordings
12. DCF-77 transmission tower icon
13. Alarm icon
14. Day with month or month with day
15. Moon phase display
16. Moonrise time display
17. Moonrise/moonset icon
18. Moonset time display

19. City location display
20. Display of current indoor relative humidity with min and max recordings
21. Three weather icons for weather forecasting
22. Display of Relative air pressure in hPa with calibration facility
23. Air Pressure tendency for the last 2 hours
24. Thermo Hygro Sensor identification flag
25. Outdoor humidity display
26. Display of outdoor relative humidity with min and max recordings
27. Antenna icon

#### 4.1 Section 1 - DCF-77 Controlled Clock <sup>s 1)</sup>

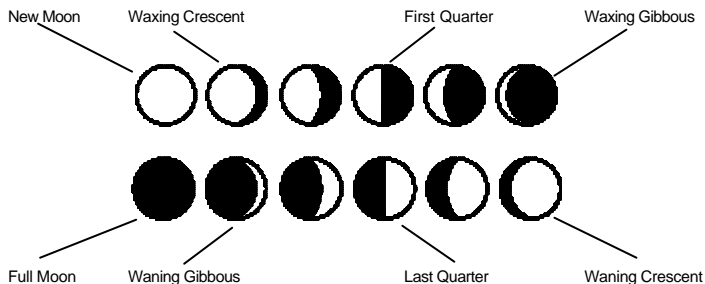
- In normal mode display of radio controlled, highly accurate time.
- By key stroke display of the date with month, weekday with day, seconds and alarm time.
- A transmission tower symbol in the middle of Section 1 of the display indicates that the DCF-77 time signal is scanned for (flashing) or received (steady).
- A small battery symbol in the lower left of section 1 indicates low running batteries.
- In programming mode display of a variety of references and setting values.

#### 4.2 Section 2 - Moon phase, sunrise/set/sun duration and moonrise/set

- In normal mode on the left side of the sunrise/set display
- In normal mode on the right side of the moonrise/set display
- In normal mode on the middle of the Moon phase and city location display

##### 4.2.1 Moon phases symbol

The Weather Station will display all 12 Moon phases throughout the year.



##### 4.2.2 Sunrise, sunset and sun duration

- The Weather Station will automatically calculate the sunrise, sunset and sun duration time based on the city location and the set date. (see below “7.6 Sun setting”)

##### 4.2.3 Country and City locations

- 24 countries and 150 cities can be chosen and displayed in short form. (see below “17 Country and city lists”)
- Only city location will be displayed on the normal mode

#### 4.3 Section 3 - Temperature and Humidity (Indoor)

- In normal mode on the left display of the current indoor temperature.
- In normal mode on the right display of the current indoor relative humidity.
- By **≡IN≡** key stroke on the left display of the stored min and max indoor temperatures by simultaneous display of a MIN or MAX symbol in the upper center.
- By **≡IN≡** key stroke on the right display of the stored min and max indoor humidity by simultaneous display of a MIN or MAX symbol in the upper center.

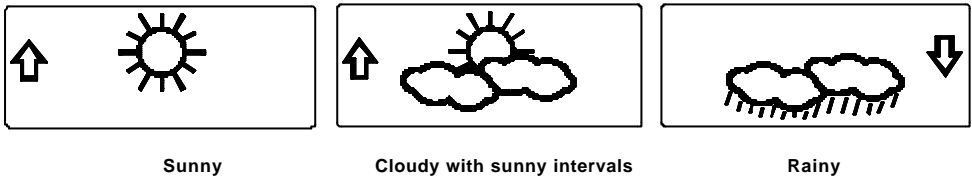
- The comfort symbols <sup>S 2)</sup> ☀️ or 🌧️ in the center inform about the comfort level of the current temperature/humidity combination.
- Underrun and overrun of a comfortable humidity level is additionally indicated next to the comfort symbols by the symbols **DRY** or **WET**.

#### 4.4 Section 4 - Weather Forecast and air pressure <sup>S 3)</sup>

Display of the weather to be expected in form of three weather symbols and - on the both sides - two weather tendency indicators in form of an arrow, which change their appearance depending on the air pressure development.

#### 4.4.1 Weather Symbols <sup>S 4)</sup>

The three weather symbols will in the following combinations provide a weather forecast upon reading any sudden changes in air pressure:



Common to weather forecasting, absolute accuracy cannot be guaranteed. The weather forecasting feature is estimated to have an accuracy level of about 75% due to the various areas it has been designed to be used in.

#### 4.4.2 Weather Tendency Indicators <sup>S 5)</sup>

The weather tendency indicator arrows are located to the both sides of the weather symbols. They indicate the air pressure development and thus, also provide a forecast of the weather to be expected. The tendency arrows can be displayed as follows:

- **Tendency arrow pointing upwards:**  
This means that the air pressure is increasing and the weather is expected to improve.
- **Tendency arrow pointing downwards:**  
This means that the air pressure is decreasing and the weather is expected to become worse.

#### 4.4.3 Bar Graph Display of Air Pressure Histories <sup>S 6)</sup>

- Depending on programming conditions, display of the history of air pressure in the past in form of a graph consisting of vertical bars.

#### 4.4.4 Air Pressure History <sup>S 6)</sup>

- The bar graph shows in Hekto Pascal (hPa) the air pressure history of the past 30 hours in 9 steps, at the points 0, -1, -3, -6, -9, -12, -18, -24, -30 hours.

#### 4.4.5 Pressure figure and Air Pressure tendency for the last 2 hours <sup>S 7)</sup>

- On the fourth part of the LCD -display of the current Absolute or Relative air pressure <sup>S 3)</sup> in hPa (Hekto-Pascal)
- If the air pressure decreases at a faster rate than normal a downward arrow symbol will flash above the air pressure display as an indication of possible storm. Flashing will stop when the air pressure stays stable or starts to increase.

#### 4.5 Section 5 - Temperature alarm, Temperature and Humidity (Outdoor)

- In normal mode on the left display of the current outdoor temperature.
- In normal mode on the right display of the current outdoor relative humidity.
- By **OUT** key stroke on the left display of the temperature alarm by display of a ALARM symbol in the upper center
- Since all these displays - depending on programming conditions and extent of the system - can be taken via key stroke from up to three outdoor sensors, a flag 1, 2 or 3 in the upper center will indicate the sensor from which the current reading originates.
- An antenna symbol in the bottom center indicates that a signal is received from the sensors.

#### 4.5.1 Temperature Alarm

The Temperature Alarm can be used as follows:

- Set to sound when the temperature is above or below of the pre-set temperature level.

### 5. Function Keys

#### 5.1 SET Key (Setting)

- To enter the manual setting mode
- To confirm the setting

#### 5.2 ALARM key (Alarm)

- To set the alarm ON/OFF
- To enter the alarm setting mode

#### 5.3 OUT Key (Outdoor)

- To set the temperature alarm ON/OFF
- To enter the temperature alarm setting mode

#### 5.4 IN Key (Indoor)

- Used to toggle between the current / maximum / minimum indoor temperature and humidity
- Press for around 3 seconds to reset the indoor maximum and minimum temperature and humidity records (will reset all records to current level)

#### 5.5 SUN/MOON Key

- To enter the Sun mode
- Used to toggle between the sunrise, sunset and sun duration time displays

#### 5.6 CH Key (Channel)

- To exit all the setting mode
- Press for around 3 seconds to reset the **outdoor** maximum and minimum temperature and humidity records (will reset all records to current level)
- Used to toggle between the outdoor temperature transmitters 1, 2 and 3

#### 5.7 + Key (Plus)

- To **increase** the value of the all setting mode
- Used to toggle between the date with month, weekday with day and seconds in the normal mode

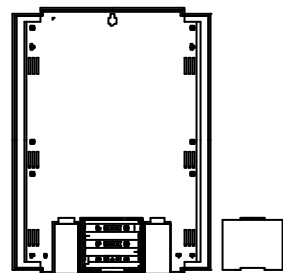
#### 5.8 - Key (Minus)

- To **decrease** the value of the all setting mode
- Used to toggle between absolute and relative pressure value display in the normal mode

## 6 Putting into Operation

### 6.1 Basic Setup

1. Open the battery cover of the Weather Station and - checking the correct polarities - insert 3 x Mignon AA, IEC LR6 1.5V batteries into the battery compartment as indicated in Item **1.1 Weather Station** and replace the cover.
2. Open the battery cover of the Thermo Hygro Sensor and - checking the correct polarities - insert 2 x Mignon AA, IEC LR6 1.5V batteries into the battery compartment as indicated in Item **1.2 Thermo Hygro Sensor** and replace the cover.
3. If you have purchased more than one sensor (up to three), sequentially repeat the above step (2) with your other sensors, but only after each one of the sensor's 868MHz signals has been received by the Weather Station. Here an order number will also be sequentially issued to the sensor.



- Your Weather Station and Thermo Hygro Sensor(s) are now operational.

**Note:**

Now that the batteries are properly installed in the Weather Station and Thermo Hygro Sensor(s) check that the frequency signals are correctly received and displayed in the appropriate sections of the LCD screen. Should any one signal not be received then see Items [9.2.1 DCF-77 Reception Check](#) and [9.2.2 433MHz Reception Check](#) below.

When doing a basic setup or reset, always remember to insert the batteries into the Weather Station **first** as this will prepare the reception mode for the Thermo Hygro Sensor(s) when they are activated. Further ensure that batteries being used are new and of correct type and size.

When replacing the battery covers, ensure that the batteries do not spring free from the contacts as this may cause start up and transmission problems.

## 6.2 Reset

- Remove the batteries from Weather Station and Thermo Hygro Sensor(s)
- Wait at least 30 seconds and then repeat the procedures specified in Item **6.1 Basic Setup** above.

**Note:**

Please keep in mind that, when resetting, **all** units have to be reset and to **always** reinsert the batteries into the Weather Station first. Always wait at least 30 seconds after removing the batteries before reinserting, otherwise start up and transmission problems may occur.

## 7 Programming

### 7.1 Transmission Code <sup>S 8)</sup>

When the Weather Station is put into operation for the first time one further programming takes place every time the unit has a power reset, i.e change of batteries. The user cannot influence this programming. Timeout for this ("one further programming") 868MHz reception is about 5 minutes but under normal conditions, reception of all transmitters should all be received well within this time. The completion of this programming is indicated by the eventual display of all indoor and outdoor data. The Weather Station is now fully operable.

### 7.2 Programming from Normal Display Mode

The programming mode can now directly be entered by pressing the **SET** key for at least 2 seconds.

During programming all below listed modes (in numerical order) can be chosen and changed by the user by repeatedly pressing the **+** or **-** key. Press **+** key to increase the current selection, and press **-** key to decrease the current selection.

- Time Setting (Hours and Minutes)
- Selection Mode 12/24 Hour Display
- Calendar Setting (year, month, day and weekday)
- Country display
- City display
- Time Zone Setting
- Temperature Reading in °C (degrees Celsius) or °F (degrees Fahrenheit)
- Calibration Mode Relative hPa
- Sensitivity of Weather Forecast
- Storm warning
- Storm alarm ON/OFF
- Setting of LCD Contrast

#### 7.2.1 Time Setting Mode

- The hour digits will start flashing in Section 1. Set the desired hours by pressing the **+** or **-** key followed by pressing the **SET** key.
- Now the minute digits will start flashing. Set the desired minutes by pressing the **+** or **-** key followed by pressing the **SET** key to move to the **12/24 hours mode**.

**Note:**

If the DCF-77 time signal is already received by the Weather Station and is correctly displayed, then the time setting can be omitted.

**7.2.2 Selection Mode 12/24 Hours Display**

1. The **12** or **24** in Section 1 will be flashing (Default setting 24). Choose the desired time display mode by use of the **+** or **-** key.
2. Press the **SET** key to enter the **Time Setting Mode** mode.

**Note:** When 24h mode display is selected, the calendar format will be date and month display.  
When 12h mode display is selected, the calendar format will be month and date display.

**7.2.3 Calendar Setting Mode**

1. The year digits will start flashing in Section 1 of the LCD. Select the desired year by pressing the **+** or **-** key followed by the **SET** key. A range from 2000 through 2099 can be chosen.
2. The month will now start flashing. Select the desired month by pressing the **+** or **-** key again followed by the **SET** key.
3. The day will now start flashing. Select the desired day by pressing the **+** or **-** key again followed by the **SET** key.
4. The weekday now flashing can also be selected by use of the **+** or **-** key. Press the **SET** key to enter the selection mode **Country Setting**.

**Note:**

If the DCF-77 time signal is already received by the Weather Station and is correctly displayed, then the calendar setting can be omitted.

**7.2.4 Country Setting Mode**

1. The country digits will start flashing in Section 2 of the LCD. Select the desired country by pressing the **+** or **-** key. 24 countries can be chosen.
2. Press the **SET** key to enter the selection mode **City Setting mode**.

**7.2.5 City Setting Mode**

1. The city digits will start flashing in Section 2 of the LCD. Select the desired year by pressing the **+** or **-** key. 150 cities can be chosen.
2. Press the **SET** key to enter the selection mode **Time zone setting**.

**Note:**

Some countries may only provide one city to choose.

**7.2.6 Time Zone Setting**

1. The display **0** will start flashing in Section 1 (Default setting 0). If you want to display a different time zone (e.g. British summer or winter time) then set the desired deviation (**-12 to +11 hours**) to the CET (Central European Time) display of the DCF-77 signal by use of the **+** or **-** key.
2. Press the **SET** key to move to the **Temperature reading in °C/°F**.

**7.2.7 Temperature Reading in °C/°F**

1. The characters **C** or **F** will start flashing in Section 1 (Default setting C). Using the **+** or **-** key select **C** for temperature reading to be in degrees Celsius or **F** for temperature reading to be in degrees Fahrenheit.
2. Now press the **SET** key to enter the mode **Calibration mode relative hPa**.

**7.2.8 Calibration Mode Relative hPa <sup>s 3)</sup>**

1. The digits of the Relative hPa display will start flashing in section 4 of the LCD. Using the **+** or **-** key select the desired setting in "hPa". (Range from **960 hPa to 1040 hPa**)

2. Press the **SET** key to move to the **Sensitivity of Weather Forecast**.

**Note:** This calibration facility is useful for those users living at various elevations above sea level, but wanting their air pressure display based at sea level.

#### **7.2.9 Sensitivity <sup>S9</sup> of Weather Forecast (Change in hPa)**

1. The hPa sensitivity will start flashing in the air pressure part of the LCD (Default setting is 3). Using the **+** or **-** key select the desired sensitivity level (2, 3 or 4 hPa) leading to a change of the forecast weather symbols.
2. Press the **SET** key to enter the **Sensitivity of storm warning**.

### 7.2.10 Sensitivity <sup>S9)</sup> of storm warning

1. The hPa sensitivity will start flashing in the air pressure part of the LCD (Default setting 5). Using the **+** or **-** key select the desired sensitivity level (3, 4, 5, 6, 7, 8 or 9 hPa) leading to the activation of storm warning feature.
2. Press the **SET** key to switch to the **Storm warning alarm On/Off**.

### 7.2.11 Storm warning alarm On/Off

1. Either a **AON** or **AOFF** will appear on the LCD. (Default setting "AOFF").
2. Press **+** or **-** key, Select **AON** to set the storm warning alarm ON, or **AOFF** to set the storm warning alarm OFF.
3. Press the **SET** key to return back the normal display.

### 7.2.12 Setting of LCD Contrast

1. The word **LCD 7** will start flashing in Section 1 of the LCD (Default setting LCD 7).
2. Using the **+** or **-** key choose the most convenient contrast (1 - 16 contrast levels) for the location of the Weather Station.
3. Press the **SET** key again to exit the mode.

## 7.3 Leaving the Programming Mode

- To return to the normal display mode from anywhere in programming mode simply press either the **CH** key at any time.
- Upon finishing the programming cycle (Items 7.2.1 thru 7.2.12) the programming mode is automatically exited by pressing the **SET** key.
- If in programming mode no key is pressed for at least 16 seconds the Weather Station will automatically switch back to normal display mode.

## 7.4 Selection Mode Relative or Absolute display

- Using the **-** key, select the air pressure reading between the relative and absolute display mode.

### Note:

The display of the Absolute air pressure cannot be changed by the user.

If the display of the Relative air pressure needs to be calibrated to the elevation of your location with regard to sea level then choose the display mode Relative hPa.

## 7.5 Alarm setting

**The maximum alarm duration is 2 minutes. To set the alarm function:**

1. Press and hold down the **ALARM** key for about 2 seconds or until the hour digit start flashing in the LCD.
2. Press the **+** or **-** key to set the desired hour.
3. Press the **SET** key again to enter the minute mode. The minute digits start flashing.
4. Press the **+** or **-** key to set the desired minutes.
5. Press the **SET** or **CH** key to exit the Alarm setting mode

### Note:

Upon exit the alarm setting mode, the alarm will be automatically ON.

### 7.5.1 To activate / deactivate the alarm

The alarm will automatically be ON upon entering and exiting the Alarm setting mode. To deactivate the alarm (OFF), use the **ALARM** key in normal display mode.

### 7.5.2 Snooze function

- When pressing the **☀SUN/MOON☀**, **☀CH☀**, **☀+☀** or **☀-☀** key once during alarm sounding, the snooze function is activated for a duration of 5 full minutes.
- When pressing the **☀IN☀**, **☀OUT☀**, **☀ALARM☀** or **☀SET☀** key during alarm sounding or snooze function for 1 second, after confirmation of a "beep" sound, the alarm will switch OFF for the next 24 hours and no snooze function will be activated.

## 7.6 Sun Setting

By pressing the **☀SUN/MOON☀** key for about 2 seconds, the following setting can be changed:

- Country location
- City location
- Year and Date setting of city

### 7.6.1 Selection of country location

24 countries can be chosen from and every one is displayed in short-form (i.e. Germany = D).  
(See below **☀17. Country and city location lists☀**)

1. The country's name will start flashing in section 2 of the LCD.
2. Use the "+" or "-" key to select the country.
3. Press the **"SET"** key again to confirm the country location and enter into city setting mode .

### 7.6.2 Selection of city location

150 cities can be chosen from and every city is displayed in short-form (i.e. Germany = D).  
(See below **"17. Country and city location lists"**)

1. The city's name will start flashing in section 2 of the LCD.
2. Use the "+" or "-" key to select the city.
3. Press the **"SET"** key again to confirm the city location and enter into **☀Date setting of city location☀**.

### 7.6.3 Date setting of city location

To change and view the sunrise/sunset/sun duration time and moon phase of the selected city at another year and date different than the current set date and year. When press **☀CH☀** key to exit, no calculation will be processed.

1. The year digits will start flashing in Section 1 of the LCD. Select the desired year by pressing the **☀+☀** or **☀-☀** key followed by the **☀SET☀** key. A range from 2000 through 2099 can be chosen.
2. The month will now start flashing. Select the desired month by pressing the **☀+☀** or **☀-☀** key again followed by the **☀SET☀** key.
3. The day will now start flashing. Select the desired day by pressing the **☀+☀** or **☀-☀** key again followed by the **☀SET☀** key.
4. Press **☀SUN/MOON☀** key to calculate automatically the sunrise/sunset/sun duration and moonrise/moonset time accordingly with the desired date.

#### Note:

During calculation, sunrise, sunset, moonrise and moonset will display "----" and flashing, it take about 10 seconds processing.

After calculation, the data will be displayed about 30 seconds. To return the normal mode, press the **☀CH☀** key or "wait for about 30 seconds.

Upon exiting the **☀Date setting of city location☀**, the date will change back to the date in normal display mode. To view the sunrise/sunset/sun duration time again for that particular day or another day, users have to repeat the steps as describe in **☀7.6 Sun setting ☀**.

## 7.7 Temperature alarm setting

1. Press the **☀OUT☀** key for 2 seconds to enter the setting mode, The "Lo" and "Hi" symbol will appear section 5 on the LCD
2. The Low temperature digit will be flashing, Select the low temperature by pressing the **☀+☀** or **☀-☀** key followed by the **☀SET☀** key.

3. The High temperature digit will now start flashing, Select the high temperature by pressing the **⊕** or **⊖** key followed by the **SET** key to exit the mode.

## 7.8 Temperature alarm setting

- Press **OUT** key to set the temperature alarm On/OFF. To set ON, "ALARM" symbol will appear section 5 of the LCD. To set OFF, "ALARM" symbol will not appear section 5 of the LCD.
- The extremely value of temperature alarm setting is **-30°C for low and +60°C for high**, when the pre-set temperature is over specify value, the ' \_ ' 2 bars will appear to disable alarm.

## 8 Operation

As described earlier in this manual (see Item **4 LCD Screen**), the various small sections of the LCD screen of the Weather Station are able to provide a number of additional information besides their normal display functions. These can be reached from the normal display mode in the following way:

### 8.1 Display of Data of several Thermo Hygro Sensors

If you are operating all three possible Thermo Hygro Sensors, you are able to toggle between these three outdoor temperature and humidity readings by use of the **CH** key. In this case the flag in the lower center of Section 5 will indicate the sensor from which the signal originates by showing its assigned order number. If you own two sensors there will only be order numbers 1 or 2 displayed. If you are operating only one sensor, no sensor order number will be displayed.

### 8.2 Minimum/Maximum Display <sup>S 10)</sup>

#### 8.2.1 Polling Minimum/Maximum

By repeatedly pressing the **IN** key it is possible to **sequentially display all stored minimum and maximum indoor temperatures/humidity. This is performed in the following way:**

##### 8.2.1.1 Polling Indoor Data (**IN** Key)

- Display of minimum indoor temperature on the left and minimum indoor humidity on the right of Section 3 (MIN display in the upper center)
- Display of maximum indoor temperature on the left and maximum indoor humidity on the right of Section 3 (MAX display in the upper center)
- Return to normal time display mode by pressing the **IN** key one more time.

#### 8.2.2 Reset Minimum/Maximum

**By pressing and holding the **IN** key for at least 2 seconds all stored minimum and maximum indoor temperatures/humidity will be reset to their current values.**

**By pressing and holding the **CH** key for at least 2 seconds all stored minimum and maximum outdoor temperatures/humidity will be reset to their current values in three of outdoor channels.**

### 8.3 Date, Weekday and Seconds Display

Pressing and holding the **⊕** key for at least 1 seconds in normal display mode will toggle between the date with month, weekday with day, seconds and alarm time displays.

## 9 Data Transmission and Reception

### 9.1 Criteria for Reception <sup>S 11)</sup>

The software of the Weather Station performs for reception and computing of displayed values a number of comprehensive operations <sup>S 11)</sup> which are not necessarily important for the user to know. There are only two items to be closely observed by the user:

1. In case the time is not correctly displayed in Section 1 of the LCD, then please see Item [9.2.1 DCF-77 Reception Check](#).
2. If perceptibly the reception of any one of the outdoor signals (outdoor temperature and humidity in Section 5 of the LCD) is disturbed, then see Item [9.2.2 868MHz Reception Check](#).

## 9.2 Remote Control

### 9.2.1 DCF-77 Reception Check

The Weather Station will automatically start scanning for the DCF-77 frequency signal (time signal transmission) after the batteries are inserted. In normal surroundings (i.e. away from interfering sources such as TV sets), it takes between 3 to 5 minutes to receive the signal. If after 10 minutes of inserting the batteries the DCF-77 signal is not properly received then check the following list before manually setting the time (see [Item 7.2.1 Time Setting Mode](#)).

1. The distance of the units should be at least 1.5 - 2.0 Meters away from interfering sources such as computer monitors or TV sets.
2. Avoid placing the units onto or in the immediate proximity of metal window frames.
3. Within thick concrete rooms such as basements and tower blocks, the DCF-77 frequency signal is naturally weaker for reception. In extreme cases, place the unit closer to a window and/or point its front or rear towards the Frankfurt transmitter (again avoid placing near metal frames or structures).

#### Note:

Users may be located in areas where atmospheric disturbances are the immediate cause for not receiving the DCF-77 frequency signal. During nighttime, atmospheric disturbances are usually less severe and reception is possible in most cases. With a single daily reception, it is adequate for the Weather Station to keep time accuracy deviation to below 0.5 seconds in a period of 24 hours.

When reception is successful, the DCF-77 transmission tower icon will start flashing on the LCD as a sign that the signal has been located and is about to be received. Once the signal has been locked, the DCF-77 tower icon will stay fixed on the LCD and the received time will then update and correct the manually set time.

### 9.2.2 868MHz Reception Check

Similar to the DCF-77 signal, the Weather Station will automatically start scanning for the Thermo Hygro Sensor's 868MHz signal after the batteries are inserted. If the outdoor temperature and outdoor relative humidity reading are not correctly displayed after about 30 seconds, then check the following list before resetting the units (see [Item 6.2 Reset](#)).

1. The distance of the units should be at least 1.5 - 2.0 Meters away from interfering sources such as computer monitors or TV sets.
2. Avoid placing the units onto or in the immediate proximity of metal window frames.
3. Using other electrical products such as headphones or speakers that operate on the same frequency signal (868MHz) may prevent the transmission pick up.
4. Neighbours using electrical items operating on the 868MHz signal can also cause interference.

#### Note:

When the 868MHz signal for the outdoor temperature and relative humidity has been received, do not reopen the battery cover to either Weather Station or Thermo Hygro Sensor as the batteries may accidentally spring free from the contacts and force a false reset. Should this happen then reset both units (see [Item 6.2 Reset](#)) otherwise transmission problems may occur.

The transmission range from the Thermo Hygro Sensor to the Weather Station (868MHz) is up to appr. 20 Meters in open space, but again this depends on the surrounding environment and interference levels. If reception is still not possible, then reset all units (see [Item 6.2 Reset](#)).

The Thermo Hygro Sensor's transmission range may be affected by exposure to extreme cold conditions (e.g. -25°C) for long periods of time. Should this happen, the 868MHz signal may be weakened and therefore result

in shorter transmission distances. The battery life may also be greatly reduced by exposure to such sub-zero temperature levels.

## 10 Positioning

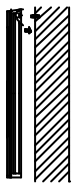
### 10.1 Positioning the Weather Station



The Weather Station is shipped with a foldable table stand. It can thus be used standing on a table or hung to a wall. To stand on a flat surface please do the following:

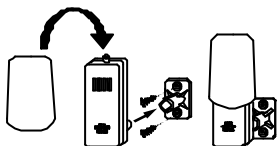
Simply unfold the 2 stands at the back of the unit and place on a flat surface.

To wall mount please do the following:



1. Fix a screw (not supplied) into the desired wall, leaving the head extended off the wall by about 5 mm.
2. Using the Weather Station's hanging hole on the back of the unit, carefully hang it onto the screw. Always ensure that the product securely locks onto the screw head before releasing.

## 10.2 Positioning the Thermo Hygro Sensor



The Thermo Hygro Sensor is supplied with a mounting bracket and two screws for wall mounting. Be sure to differentiate each of the Sensors since they are not numbered and have no specific order for setup (also see **6.1 Basic Setup**).

### Note:

Users are recommended to check that the DCF-77 and 868MHz signals are properly received before permanent standing, hanging or mounting of Weather Station and Thermo Hygro Sensor(s). Should the Weather Station not pick up either signal from the desired location, then relocate slightly. Once the signals are received, mount your system units permanently.

## 11 Important Notes

- Avoid placing the Weather Station where it can be exposed to sudden changes in temperature, i.e. direct sunlight, extreme cold and wet/moist conditions since the design of this product is for indoor use only. This will help to avoid any inaccurate readings and any possible damage to the unit.
- Should the Weather Station be exposed to extreme and sudden temperature changes, it will lead to rapid changes in its readings and thereby reduce its accuracy.
- Should the Weather Station be moved to another location that is significantly higher or lower than its initial standing point (e.g. from the ground floor to the upper floors of a house), then either reset the units or discard the readings of the weather forecast for the next 12 to 24 hours. By doing so, this will allow sufficient time for operation at a constant altitude and thus enabling a more accurate forecast.

## 12 Care and Maintenance

- Avoid placing the units in places prone to extreme temperatures, vibration and shock as these may cause damage and inaccurate readings.
- When cleaning the Weather Station's display and casing, use a soft damp cloth only. Do not use solvents or scouring agents as they may mark the LCD and casing.
- Do not submerge the unit in water.
- Immediately remove all low powered batteries to avoid leakage and damage. Replace only with new batteries of the recommended size.
- Do not make any attempts to repair the units. Return them to the original point of purchase for repair by a qualified engineer. Opening and tampering with the units may invalidate their guarantee.

## 13 Battery Change

For best performance, batteries to all units should be replaced when the low battery indicator is displayed on the left of the transmission tower icon in Section 1 of the LCD or at least once a year to maintain maximum running accuracy.



Please help in the preservation of the environment and return used up batteries only to an authorized depot.

## 14 Specifications

Radio controlled time signal	:	DCF-77
Recommended operating temperature	:	
Weather Station	:	-9.9°C to +59.9°C
Thermo Hygro Sensor	:	-29.9°C to +59.9°C
LCD contrast	:	16 levels
Temperature measuring range	:	
Indoor	:	-9.9°C to +59.9°C with 0,1°C resolution ("OFL" displayed if outside this range)
Outdoor	:	-29,9°C to +59,9°C with 0,1°C resolution ("OFL" displayed if outside this range)
Relative humidity range (Indoor and outdoor)	:	20% to 95% with 1% resolution (Display "- -" if outside this range or temperature is OFL)
Air pressure	:	
Absolute hPa	:	700 hPa to 1099 hPa
Relative hPa (selectable)	:	960 hPa to 1040 hPa
Sensitivity setting hPa	:	2, 3 and 4 hPa
Storm warning	:	3 to 9 hPa
Air pressure history	:	For the past 30hours (0, -1, -3, -6, -12, -18, -24 and -30)
Data checking intervals	:	
Indoor Temperature	:	Every 15 seconds
Humidity	:	Every 20 seconds
Outdoor (Reception Weather Station)	:	
Temperature	:	Every 5 minutes.
Humidity	:	Every 5 minutes.
Air Pressure	:	Every 15 seconds.
Data reading update (Sensor)	:	
Outdoor Temperature	:	Every 1 minute
Outdoor Humidity	:	Every 1 minute
Transmission Frequency	:	868.35 MHz
Transmission Range	:	up to 20 Meters
Transmission Power	:	-3dBm
Power Supply	:	
Weather Station	:	3 x AA, IEC LR6, 1.5V Batteries
Thermo Hygro Sensor	:	2 x AA, IEC LR6, 1.5V Batteries
Dimensions (L x W x H)	:	
Weather Station	:	190 x 22 x 257mm
Thermo Hygro Sensor	:	56 x 73 x 124mm

## 15 Liability Disclaimer

- The manufacturer and supplier cannot accept any responsibility for any incorrect readings and any consequences that occur should any inaccurate reading take place.
- This product is not to be used for medical purposes or for public information.
- This product has been designed for strict use in the home as an indicator of the future weather and is not 100% accurate. Weather forecasts and barometric readings given by this product should be taken only as an indication and not as being totally accurate.
- The specifications of this product may change without prior notice.
- This product is not a toy. Keep out of the reach of children.
- No part of this manual may be reproduced without written consent of the manufacturer.

## 16 Subject Index

Here the interested user will find a number of additional informations regarding the function of this Weather Station. Their knowledge however is not necessary for efficient operation of this system.

### § 1) Clock, Radio Controlled

The time base for radio controlled time and date is a Cesium Atomic Clock operated by the Physikalisch Technische Bundesanstalt Braunschweig, which has a time deviation of less than one second in one million years. This signal is coded and transmitted from Mainflingen near Frankfurt via longwave frequency signal DCF-77 and has a transmission range of approximately 1,500km. The Weather Station receives this signal and converts it for display. So when within this range the time information received and displayed is absolutely accurate regardless of summer or wintertime.

### § 2) Comfort Level Icons

With these icons the users can determine the effect of temperature and relative humidity with regard to the comfort level within their current surroundings.

The Weather Station indicates the present comfort level by showing the icons "Bright" ("☀") or "Sad" ("☹"). If the indoor temperature is in the range between +20°C and +26°C and the relative humidity **between 45% and 65%**, the "Bright" icon will be displayed. If either temperature or humidity is outside of this range, the "Sad" icon will be shown. Thus the symbol "☀" will indicate a high, the symbol "☹" a low comfort level.

If the "Sad" icon ("☹") is displayed simultaneously with the words "DRY" or "WET", then the relative humidity will be below or above the comfortable level. If only the temperature is outside of the comfortable range, none of these words will be displayed. The "Sad" icon ("☹") along with the word "DRY" will thus indicate a relative humidity **below 44%**, along with the word "WET" **above 66%**.

If the temperature is below 0°C or higher than +45°C then the result of the humidity measurement may differ from the real humidity value. The further the temperature is out of range, the bigger may be the difference to the real humidity. If the temperature is outside its measuring range ("OFL" display), the humidity can no longer be calculated and "∞-∞" is shown on the display.

### § 3) Air Pressure, Absolute/Relative

The display of the current air pressure on the Weather Station takes place in **Absolute hPa (Hekto-Pascal)** and **Relative hPa**. The setting in Absolute hPa gives the display of the true air pressure at the current time and location and cannot be calibrated, while the display of the Relative hPa or bases on a manually programmable setting range.

Relative air pressure is the one value which is calculated back to sea level from the local Absolute air pressure and is thus valid as a reference for weather condition and weather development for the entire country (so an Absolute air pressure of 961 hPa in Munich at an approximate altitude of 600 Meters above sea level corresponds to a Relative air pressure of 1021 hPa at sea level). Relative air pressure also is the one value given by the various TV and radio broadcasting stations in their daily weather forecasts for their respective locations. If the Weather Station needs to be calibrated it is therefore recommended to get the currently valid Relative air pressure at your radio station or your local weather services.

For accurate reading of the barometric values the Weather Station should be kept at a constant altitude at all times. E.g. it should not be randomly moved from the ground level to the upper floors of a building. If this should be necessary, then a setup or reset should be performed and all weather readings should be discarded for the next 12 to 24 hours. This will allow sufficient time for the Weather Station to operate at a constant altitude and thus enable an accurate reading.

The display of the Weather Station bases on the average value of the last 10 air pressure measurements. The calculation of the average takes place after every reading. If the new pressure value has a difference of 1.0 hPa or more to the old average, it will be set to the new value.

### § 4) Weather Symbols

For every sudden or definite change in air pressure, the weather symbols will update accordingly to represent this change. This means that the icons will not change if there is no noticeable movement in the weather. If the symbols do not change it simply means that either

1. the weather has not changed or
2. the weather change has been so slow that it has not been possible to read when the actual change had taken place.

The sensitivity to air pressure changes responsible for a change of the display of weather icons is programmable (2, 3 or 4 hPa). In areas where weather icons do not change easily because of almost stagnant air pressure, users may consider setting a lower hPa setting to allow for a more sensitive air pressure reading. The weather icons displayed forecast the future weather in terms of getting better or worse and not necessarily sunny or rainy as each icon indicates. E.g., if the current weather is cloudy and the rain icon is displayed, it does not mean that the product is faulty because it is not raining. It simply means that the air pressure has dropped and the weather is expected to get worse but not necessarily raining.

#### s 5) **Weather Tendency**

Because of the combination of weather icons and weather tendency arrows, the Weather Station can also show how the weather has changed and is expected to change. E.g., if the tendency arrow pointing downwards is displayed along with the cloud and sun symbols then the last noticeable change in the weather was when it was sunny (sun icon only). This means that the next change in weather will show the rainy icon since the tendency indicator is pointing downwards.

The weather tendency indicator arrow will remain on the LCD regardless of the weather. E.g., if the current weather is raining and the indicator is pointing downwards, it means that the weather will remain poor. If the weather is sunny and the indicator is pointing upwards, it means that the weather is expected to continue being fine.

Does the air pressure drop at an extreme rate from 3 to 9 hPa or more in six hours the tendency arrow icon flashing in Section 5 of the LCD will flash as an indication of possible storm. The flashing will cease only if the air pressure stays stable or starts to rise again.

#### s 6) **Air Pressure History**

The bar graph of the electronic barometer shows the air pressure history of the past 30 hours in 9 steps at the points 0, -1, -3, -6, -12, -18, -24 and -30 hours. The bars are plotted at each of the 9 steps and give the trend over the recorded period. The scale on the right compares the result. The "0" in the middle of this scale determines the current air pressure. Each change ( $\pm 1$ ,  $\pm 3$ ,  $\pm 5$  and  $\pm 7$ ) shows in Hekto-Pascal (hPa), how high or low the past air pressure was as compared to the current one. If the bars are rising it indicates that the weather is getting better due to an increase in air pressure. If the bars go down it indicates a drop of the air pressure and the weather is expected to get worse from the present time "0".

At every full hour the current air pressure is used as a basis for the display of a new graph bar. The existing graph is then moved one bar to the left.

#### s 7) **Pressure Tendency for the last 2 hours**

The small bar graph of the electronic barometer shows the air pressure tendency of the last 2 hours. Each change ( $\pm 0.2$ ,  $\pm 0.5$ ,  $\pm 1$ ,  $\pm 2$  and  $\pm 4$ ) shows in Hekto-Pascal (hPa). Every pressure measurement the current average pressure is compared with the 4 recorded pressures in last 2 hours. The maximum difference between the current average pressure and all the 4 compared is displayed on the small bar graph from range  $\pm 4$  hPa.

#### s 8) **Transmission Code**

At first setup of the Weather Station an automatic programming takes place which cannot be influenced by the user. It is this the learning of the various transmission codes of the Thermo Hygro Sensors by the Weather Station. By this procedure a clear allocation of all parts of the system to each other takes place, serving the safety of signal transmission. This learning procedure takes place along with the reception of the first valid

data and the update of data first displayed on the LCD. It can be recognized by a short sequential light-up of various display segments while being tested.

After all tests have been performed the data of the indoor and outdoor readings will be displayed. The transmission code learning mode can now be terminated by pressing any one key. At the same time the radio controlled clock will start scanning for the DCF-77 signal. The Weather Station is now fully operational.

#### § 9) **Sensitivity (hPa)**

This feature allows the Weather Station to be used more accurately by setting the hPa (Hekto Pascal) sensitivity to match the users external living environment such as maritime or high altitude areas where the changes in air pressure are very different to each other. In areas that experience frequent changes in air pressure (which does not necessarily reflect a change in the weather), the sensitivity level can be set higher compared to an area where the air pressure is stagnant. E.g. if the hPa sensitivity is set to 3 hPa, then there will be no change of weather symbols if the air pressure does not drop or increase by at least 3 hPa. For areas where the air pressure is stagnant, then the hPa sensitivity can be set lower.

#### § 10) **Storage, Minimum/Maximum Value**

The Weather Station stores the minimum and maximum values of the indoor and outdoor temperatures/humidity of their occurrence. This feature is especially useful for the display of the temperatures and humidity in those locations where the Sensors and the Weather Station are placed. All newly reached minimum and maximum temperatures are automatically stored and displayed on the LCD.

#### § 11) **Software Operations**

- **DCF-77 Time Signal**

The DCF reception takes place at 2:00 and 6:00 am every fully hour each day. If the reception receive unsuccessfully in this time frame, it will attempt to receive the signal on the following day.

After every setup or reset and after leaving the programming mode the software of the Weather Station will start a reception of the DCF-77 time signal.

- **Indoor Temperature and Humidity/Air Pressure**

The software of the Weather Station will perform measurements of the current indoor temperature every 15 seconds, the current indoor humidity every 20 seconds and the current air pressure every 15 seconds. During DCF-77 reception, reception of Thermo Hygro Sensor signal, in programming mode and while any one key is pressed no reception will take place.

- **Outdoor Temperature and Humidity**

The software of the Weather Station will take readings of the current values from up to three Thermo Hygro Sensors every 5 minutes. During DCF-77 reception, in programming mode and while any one key is pressed no reception will take place.

If any one outdoor temperature or humidity cannot be received 3 times in a row, the display will show **---** for this particular value.

- **Battery**

After reset or time 0:00 a low-battery detection is started by the software of the Weather Station. If the batteries run low, a low battery indication flag is shown on the display.

#### **R&TTE Directive 1999/5/EC**

Summary of the Declaration of Conformity: We hereby declare that this wireless transmission device does comply with the essential requirements of R&TTE Directive 1999/5/EC.

## 17 Country and City location lists

24 countries and 150 cities can be chosen and displayed in short-form (i.e. Germany = D).

The countries and cities are displayed as follows:

<p><b><u>Germany = D</u></b>  Aachen = AC  Berlin = B  Dusseldorf = D  Dresden = DD  Erfurt = EF  Frankfurt = F  Flensburg = FL  Freiburg = FR  Hannover = H  Bremen = HB  Hamburg = HH  Rostock = HRO  Stralsund = HST  Koeln = K  Kiel = KI  Kassel = KS  Leipzig = L  Muenchen = M  Magdeburg = MD  Nuernberg = N  Regensburg = R  Stuttgart = S  Saarbruecken = SB  Schwerin = SN</p>	<p><b><u>France = F</u></b>  Besancon = BES  Biarritz = BIA  Bordeaux = BOR  Brest = BRE  Cherboug = CHE  Clermferand = CMF  Lyon = LYO  Marseille = MAR  Monaco = MCO  Metz = MET  Nantes = NAN  Nice = NIC  Orleans = ORL  Paris = PAR  Perpignan = PER  Lille = LIL  Rouen = ROU  Strasbourg = STR  Toulouse = TOU</p>	<p>Milano = MIL  Napoli = NAP  Palermo = PAL  Parma = PAR  Perrugia = PER  Roma = ROM  Torino = TOR  Trieste = TRI  Venezia = VEN  Verona = VER  Ventimiglia = VTG</p>	<p>Malmo = MLO  Stockholm = STO</p> <hr/> <p><b><u>Slovakia = SK</u></b>  Bratislava = BRV</p> <hr/> <p><b><u>Slovenia = SLO</u></b>  Ljubljana = LJU</p> <hr/> <p><b><u>Jugoslavia = YU</u></b>  Bergrade = BEO</p>
<p><b><u>Danmark = DK</u></b>  Alborg = ALB  Arhus = ARH  Copenhagen = CPH  Odense = ODE</p>	<p><b><u>Finland = FIN</u></b>  Helsinki = HEL</p>	<p><b><u>Ireland = IRL</u></b>  Dublin = DUB</p>	<p><b><u>Austria = A</u></b>  Graz = GRZ  Innsbruck = INN  Linz = LNZ  Salzburg = SLZ  Vienna = VIE</p>
<p><b><u>Spain, Andorra = E</u></b>  Alicante = ALI  Andorra = AND  Badajoz = BAD  Barcelona = BAR  Bilbao = BIL  Cadix = CAD  Cordoba = COR  Ibiza = IBZ  La Corogna = LCO  Leon = LEO  Las Palmas = LPA  Madrid = MAD  Malaga = MAL  Palma de Mallorca = LPM  Salamanca = SAL</p>	<p><b><u>Great Britain = GB</u></b>  Aberdeen = ABD  Belfast = BEL  Birmingham = BIR  Bristol = BRI  Edinburgh = EDH  Glasgow = GLW  London = LON  Manchester = MAN  Plymouth = PLY</p>	<p><b><u>Luxembourg = L</u></b>  Luxembourg = LUX</p>	<p><b><u>Belgium = B</u></b>  Antwerpen = ANT  Brugges = BRG  Bruxelles = BRU  Charleroi = CHA  Liege = LIE</p>
<p><b><u>Italy = I</u></b>  Ancona = ANC  Bari = BAI  Bologna = BOL  Cagliari = CAG  Catane = CAT  Firenze = FIR</p>	<p><b><u>Hungary = H</u></b>  Budapest = BUD</p>	<p><b><u>Norway = N</u></b>  Bergen = BGN  Oslo = OSL  Stavanger = STA</p>	<p><b><u>Switzerland, Liechtenstein = CH</u></b>  Basel = BAS  Bern = BER  Chur = CHR  Geneva = GNV  Locarno = LOC  Lucerne = LUC  St Moritz = MOR  St Gallen = SGL  Sion = SIO  Vaduz = VDZ  Zuerich = ZUR</p>
<p><b><u>Poland = PL</u></b>  Gdansk = GDZ  Krakow = KKW  Poznan = POZ  Szcecin = SZC  Warsaw = WAW</p>	<p><b><u>Croatia = HR</u></b>  Zagreb = ZAG</p>	<p><b><u>Netherlands = NL</u></b>  Amsterdam = AMS  Arnheim = ARN  Eindhoven = EIN  Enschede = ENS  Groningen = GRO  Den Haag = HAA  Rotterdam = ROT</p>	<p><b><u>Czech Republic = CZ</u></b>  Prague = PRG</p>
<p><b><u>Russia = RUS</u></b></p>	<p><b><u>Portugal = P</u></b>  Evora = AVO  Coimbra = COI  Faro = FAR  Leiria = LEI  Lisbon = LIS  Porto = POR</p>	<p><b><u>Portugal = P</u></b>  Evora = AVO  Coimbra = COI  Faro = FAR  Leiria = LEI  Lisbon = LIS  Porto = POR</p>	

Sevilla = SEV Valencia = VAL Zaragossa = ZAR	Foggia = FOG Genova = GEN Lecce = LEC Messina = MES	St. Petersburg = PET <b><u>Sweden = S</u></b> Gothenburg = GOT
--	--	--