

Instructions for Use

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Ultrasonic Bird Deflector 4.3800.90.000



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Safety Instructions

- Before operating with or at the device/product, read through the operating instructions. This manual contains instructions which should be followed on mounting, start-up, and operation. A non-observance might cause:
 - failure of important functions
 - endangerment of persons by electrical or mechanical effect
 - damage to objects
- Mounting, electrical connection and wiring of the device/product must be carried out only by a qualified technician who is familiar with and observes the engineering regulations, provisions and standards applicable in each case.
- Repairs and maintenance may only be carried out by trained staff or Adolf Thies GmbH & Co. KG. Only components and spare parts supplied and/or recommended by Adolf Thies GmbH & Co. KG should be used for repairs.
- Electrical devices/products must be mounted and wired only in a voltage-free state.
- Adolf Thies GmbH & Co KG guarantees proper functioning of the device/products provided that no modifications have been made to the mechanics, electronics or software, and that the following points are observed:
- All information, warnings and instructions for use included in these operating instructions must be taken into account and observed as this is essential to ensure trouble-free operation and a safe condition of the measuring system / device / product.
- The device / product is designed for a specific application as described in these operating instructions.
- The device / product should be operated with the accessories and consumables supplied and/or recommended by Adolf Thies GmbH & Co KG.
- Recommendation: As it is possible that each measuring system / device / product may, under certain conditions and in rare cases, also output erroneous measuring values, it is recommended using redundant systems with plausibility checks for security-relevant applications.

Environment

As a longstanding manufacturer of sensors Adolf Thies GmbH & Co KG is committed to the objectives of environmental protection and is therefore willing to take back all supplied products governed by the provisions of "ElektroG" (German Electrical and Electronic Equipment Act) and to perform environmentally compatible disposal and recycling. We are prepared to take back all Thies products concerned free of charge if returned to Thies by our customers carriage-paid.

Make sure you retain packaging for storage or transport of products. Should packaging however no longer be required, please arrange for recycling as the packaging materials are





Documentation

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designed to be recycled.

The device / product should not be passed on without the/these operating instructions.

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1 Device version

Article No.	Designation	Communication	Operating voltage	Connection type
4.3800.90.000	Ultrasonic bird deflector	RS485Semiconductor relay	24V AC/DC	0.2m cable with connector

Scope of supply:

- Ultrasonic bird deflector

- Coupling socket

- Operating instructions.

Special features:

- Doppler radar for safe and reliable detection of birds.
- Communication / configuration via RS485.
- Switching output (semiconductor relay) for control of other devices.
- Heating for operation in winter.

2.1 Application

The function of the ultrasonic bird deflector is to protect the ultrasonic anemometer from measuring errors which can be caused by birds.

The ultrasonic bird deflector uses a built-in Doppler radar to detect birds. If motion is detected, the device executes with fast movements with an impact arm. This arm is designed so that on contact it does not injure the bird but merely scares it with the unexpected movement. The device is equipped with a microcontroller and can be configured via a serial RS485 interface. A switching output can be used for example to transmit a signal to other devices.

The mounting for the ultrasonic bird deflector has been selected so that the flow conditions at the anemometer will not be influenced to any significant extent.



2.2 Structure

Figure 1: Ultrasonic bird deflector with ultrasonic anemometer

2.3 Mode of operation

Birds are detected through continuous analysis of the Doppler signal by an FFT algorithm. Here a bird has to remain in the detection range of the Doppler radar for a certain time. The deflector responds to slow movements made for example when a bird is perching. Fast motion is ignored. This means, that raindrops that only remain in the detection range for a short time and passing through at a high speed, will not trigger the impact arm. It is possible to select the sensitivity level here.

Configuration can be carried out using the serial interface in addition to a terminal program.

- The "**Command TL**" is used to set the threshold for the lower frequency range (slow movements).
- The "Command TH" is used to set the threshold for the upper frequency range (fast movements).
- The "Command EL" is used to set the time period.

A bird is detected when the threshold for slow movements (TL=thresh low) is exceeded for the time period selected (EL=event length).

If the threshold (TH = thresh high) is exceeded (e.g. by fast raindrops) more than once over a predefined time period, triggering of the impact arm will be blocked for the next 60s. This is designed to prevent the impact arm from being triggered too frequently during rainy periods.

The ultrasonic bird deflector operates with an adaptive threshold. Interference present over a lengthy period of time, e.g. raindrops on the housing carried by the wind, automatically causes an additional threshold value to be added to the lower threshold TL. If such interference disappears, the internal lower threshold value will be adapted again. The measured values are considered over a period of 15s for calculation of the adaptive threshold.

The impact arm moves between two adjustable positions A and B. The range of motion between the impact position (Position B) and the idle position (Position A) is approx. 180°. The servo travel between the idle position and the impact position can be selected with the **Command PA**.

The impact sequence, i.e. the number of impacts executed by the impact arm on triggering, can be selected with the **Command SF** (SF = impact sequence).

When the impact arm is triggered, a message can be output via the serial interface.

An event counter is incremented whenever the impact arm is triggered. The counter reading can then be queried via the serial interface using the **Command TR** (TR = telegram request). The event counter is reset when the device is started. The maximum counter reading is 9999. If this counter reading is exceeded, the counter is reset to '0'.

The switching output can be used e.g. to switch on other devices or for messages and is switched during the entire impact sequence on triggering of the impact arm.

The ultrasonic bird deflector is equipped with a controlled heating system to prevent the impact arm from icing up and the servomotor being blocked. The heating element is positioned next to the servomotor for this purpose. The adjustable heating ensures that the key components of the device are maintained at a minimum temperature (default=5°C). The heating can be switched off with the **Command HC**.

3 Installation

Caution:

- Electrical work should be carried out by qualified technicians.
- Start-up should be carried out by qualified technicians.
- Maintenance work should be performed when the device is de-energised to avoid triggering the impact arm.

3.1 Mechanical installation

The instructions apply to installation of the ultrasonic bird deflector on an Ultrasonic Anemometer 2D.

The bird deflector is mounted on the shaft of the ultrasonic anemometer using its holder (angle bracket and threaded clip).

The vertical distance between the upper edge of the ultrasonic anemometer housing and the upper edge of the bird deflector housing should be approx. 110mm.

The horizontal position of the bird deflector should be selected so that the impact arm can operate in the middle of two ultrasonic sensor arms.

No movable objects should be located within a radius of approx. 3m as the radar sensor may be subject to interference e.g. from moving branches, mast structures, etc.



Figure 2: Position of ultrasonic bird deflector on an ultrasonic anemometer

3.2 Electrical installation

The US device to refuse birds is equipped with a cable of 20 cm length, and an 8 pole plug for the electrical connection.

Pole view (visible)		Function
	1	24V DC/ 24V AC supply (+)
	2	24V DC/ 24V AC supply (-)
$5 \bullet \bullet \bullet 4$	3	switching output
(_ ● - ↓ - ● -)	4	switching output
\° ● T [®] ● '/	5	GND (RS485)
	6	Data- (RS485)
	7	Data+ (RS485)
	8	NC

View on the plug with functional assignment:

An 8-pole coupling socket (mating plug) is included in delivery. It serves for installation of a connecting cable by customer.

Coupling socket, view on solder connection:

Coupling socket (view on solder connection)		Function
	1	24V DC/ 24V AC supply (+)
	2	24V DC/ 24V AC supply (-)
$40 \Psi 0^{5}$	3	switching output
$\left(- \Theta - \Theta - \Theta \right)$	4	switching output
	5	GND (RS485)
	6	Data- (RS485)
	7	Data+ (RS485)
	8	NC

The cable to be connected should have the following characteristics: 7 cores,

0,25 mm² core diameter,

6 - 8 mm cable diameter,

UV- resistance,

Total shielding.

Mounting of coupling socket



3.2.1 Description of connection for optional, factory-delivered cable

The optional cable is a fully assembled 7-core cable, which is equipped on the sensor-side with a coupling socket, and on the user-side with open and color-coded core-cable ends. The cable shield is realized as further core-cable (green/yellow). The cable length is to be arranged with the factory.

Assignment and function of the factory-delivered cable:

Assignment				Function	Wire colour
				/ AC supply (+)	white
Kabel - Konfektionierung 0. 3800. 90. 901 8 pol. Binder Steckverb. 212 210		(abel -	24V DC/ 24V	/ AC supply (-)	brown
		switching ou	tput	green	
		switching ou	tput	yellow	
		GND (RS48	5)	grey	
			Data- (RS48	5)	pink
	1 2 3	3 4 5 6 7 8	Data+ (RS48	35)	blue
Kupp	Kupplungs	Kupplungsdose EMV (Binder)			
	8 po	bl. / 211 173	Cable shield		green / yellow
Kabel 7x 0,25² LiYCY schwarz 211 223	weiß / white braun / brown grün / green	gelb / yellow grau / gray rosa / pink blau / blue grün - gelb / green -yellow			

3.3 Start-up

The device is preconfigured on delivery and merely needs to be mounted on the measuring device to be protected (see Installation) and switched to a supply voltage. The device requires DC or AC voltage of 24V. The voltage source must be capable of supplying a current of up to 1.5A on a short-term basis. This current is required during triggering of the impact arm. In the idle state (heating off) the device requires approx. 48mA.

It takes 15 seconds after switch-on until the device is ready for operation. No commands can be processed during this period. If settings are to be changed, this is possible via the RS485 interface using a terminal program. The RS485 interface operates in half-duplex mode. On delivery the device is set to a baud rate of 9600 bd.

A list of supported commands can be displayed with the **Command HH** (ID on delivery "00").

If the device is to activate another device on triggering or to transmit a signal, this can take place via the switching output. The switching output of the device is suitable for both DC and AC voltages up to 24V. Currents up to 0.5A can be safely switched. The switching output is switched whenever the impact arm is triggered.

If you wish to test the ultrasonic bird deflector when switched on, you can move e.g. your hand slowly in the detection range of the Doppler radar. When doing so, make sure that motion within the Doppler radar's detection range results in adaptation of the threshold (adaptive threshold). Before repeating the test it may therefore be necessary to wait for a certain period. In this time motion in the detection range of the Doppler radar should be avoided.

If the device does not respond satisfactorily to a bird, the sensitivity level can be adjusted. By reducing the threshold for slow movements with the **Command TL** and the time period "event length" it is possible for example to increase the sensitivity level.

If the sensitivity is increased, motion is detected more quickly but this also increases the susceptibility to interference. To prevent the impact arm from being triggered too frequently, there is a waiting time which needs to pass until the impact arm can be triggered again. This waiting time can be selected with the **Command WT**. The default for the waiting time until the impact arm is triggered again is 5s.

If the device fails to respond to motion, check whether the rain flag (see Data telegram) is set. If this flag is set, the impact arm will not be triggered. The flag should be reset after one minute at the latest if no object moves in the detection range of the Doppler radar. If this is not the case, the threshold for fast movements should be increased with the **Command TH**. Increasing the threshold for fast movements can reduce the sensitivity for the detection of fast movements and thus also for rain.

4 Maintenance

Caution:

Cleaning should be performed when the device is de-energised to avoid triggering the impact arm.

The device is maintenance-free.

Cleaning:

Depending on the installation location and the associated type and level of soiling we recommend inspecting the device at appropriate intervals and performing cleaning as necessary. For cleaning a dampened cloth should be used without chemical cleaning agents.

5 Serial communication

The interface to the sensor consists of a RS485 link (half-duplex mode), with the following data format:

- 9600 baud (the baud rate can be selected with the **Command BR**).
- 8 data bits.
- No parity.
- 1 stop bit.
- Data in ASCII format (command interpreter: THIES).
- Data in binary format (command interpreter: MODBUS RTU).

On start-up of the ultrasonic bird deflector, the software version number and the bus ID are output at the baud rate selected.

Example:

THIES ultrasonic bird deflector V0.8 ID00

5.1 Command interpreter THIES

The ultrasonic bird deflector is equipped with the Thies type command interpreter, which can be used to adjust the behaviour of the device. For example, it is possible to change the impact sequence of the device.

Commands basically have the following structure:

- <id><command><CR> (No parameter: used to interrogate the selected parameter).
- <id><command><parameter><CR> (With parameter: used to set a new parameter).

id:	Identification number ("00" to "99").
command:	Command encompassing 2 characters (see list of commands).
parameter:	Parameter value with between 1 to 5 positions (decimal value in ASCII format).
<cr>:</cr>	Carriage return (13dec; 0x0D)
<lf></lf>	Line feed (10 _{dec} ; 0x0A)

The 'id' identification number allows several devices to be operated together in a bus system. Every device is assigned its own 'id' (see **Command ID**).

A transmitted command is acknowledged with an echo telegram.

The echo telegram starts with a "!" followed by the id, command and value selected. Afterwards, the signs <CR> "carriage return" and <LF> "new line" follow. With output of the help text each text line is completed by <CR><LF>. Commands can be transmitted with or without a parameter. If no parameter is specified, the set value will be output.

Example: 00BR<CR> !00BR00005<CR>

If a command is transmitted with a parameter, the parameter is verified. If it is valid, it will be saved and specified in the echo telegram. If the parameter is invalid, it will be disregarded and the set value output in the echo telegram. Valid parameters are stored in the flash memory. The settings are retained with a restart.

Examples:

00BR00005 <cr></cr>	Transmission command.
!00BR00005 <cr></cr>	Echo telegram (parameter valid and password OK).
00BR00004 <cr></cr>	Transmission command. Echo telegram (parameter valid but key incorrect)

Note:

Some commands do not require parameters and are used e.g. to control the device. With these commands the response telegram may be omitted or look different. The command TR can for example be used to request a data telegram. The ultrasonic bird deflector will then not respond with the echo telegram but with the requested data telegram. See the description of the command for further details.

To avoid any unintentional change in parameters some commands (see list of commands) are protected with a password. This password must be transmitted before the actual command.

Example: Changing the baud rate

00KY1 <cr></cr>	Release user level commands.
00BR96 <cr></cr>	Set baud rate to 9600 baud.
!00BR00096 <cr><lf></lf></cr>	Baud rate set to 9600 baud.

Caution:

Password-protected commands are released for a period of 120s.

5.1.1 Data telegrams

Data output takes place in response to the command TR. The data telegram can be additionally output at fixed intervals.

A telegram can also be transmitted when the impact arm is triggered. It contains a text message that the impact arm has been triggered.

Calculation of the checksum, the composition of the status word and the control characters/separators used in the telegrams are described below.

Control characters:

- STX Start of text (2 dec;0x02)
- ETX End of text (3 dec; 0x03)
- CR Carriage return (13_{dec}; 0x0D)
- $LF Line feed (10_{dec}; 0x0A)$

Separators:

The semicolon ';' is used as the separator between the individual measured values in the string. The checksum separator is the multiplication sign '*'.

Checksum:

The check sum is the XOR link of all characters up to the byte <*>. The asterisk serves as a separator from the check sum and is not included in this sum.

Data telegram:

Automatic with triggering (setting CM=1):

<STX>IMPACT ARM TRIGGERED! <ETX><CR><LF>

Timed or in response to a request:

<STX>xxxx;ttt.t;Rn*<CHECKSUM><ETX> <CR><LF>

XXXX Event counter reading

ttt.t Temperature inside housing

Rn Rain flag, set when rain is detected: R = 1 > rain, R = 0 > no rain.

5.2 Commands and description

	Command	Description
Command AC	<id>AC<para></para></id>	Select timed automatic triggering of impact arm.
Command BR	<id>BR<para></para></id>	Select baud rate.
Command CM	<id>CM<para></para></id>	Message with triggering of impact arm yes/no.
Command DM	<id>DM</id>	Start demo mode.
Command EL	<id>EL<para></para></id>	Select event length for triggering of impact arm.
Command HC	<id>HC<para></para></id>	Switch heating on/off.
Command HH	<id>HH</id>	Display Help.
Command ID	<id>ID<para></para></id>	Device ID.
Command KY	<id>KY<para></para></id>	Give access to protected parameters.
Command LD	<id>LD</id>	Load default parameters.
Command NP	<id>NP</id>	Move to zero position.
Command OH	<id>OH</id>	Query operating hours.
Command OR	<id>OR<para></para></id>	Select output rate of telegram.
Command PA	<id>PA<para></para></id>	Set travel between idle position and impact position (degrees).
Command RS	<id>RS</id>	Force restart des ultrasonic bird deflector.
Command SF	<id>SF<para></para></id>	Select impact sequence.
Command ST	<id>ST<para></para></id>	Setpoint temperature for heating control.
Command SV	<id>SV</id>	Query software version.
Command TH	<id>TH<para></para></id>	Threshold value for fast movements.
Command TL	<id>TL<para></para></id>	Threshold value for slow movements.
Command TR	<id>TR<para></para></id>	Request telegram.
Command WT	<id>WT<para></para></id>	Select waiting time between two trigger actions of impact arm.

5.2.1 Command AC

<id>AC<parameter><cr></cr></parameter></id>	Select timed automatic triggering of impact arm.
<id>AC <cr></cr></id>	Query current status.
Command echo	!xxACxxxxx <cr><lf></lf></cr>
Access:	Read / write, release via Command KY necessary.
Description:	Timed automatic triggering of the impact arm is configured with the command AC.
Parameter description:	The parameter corresponds to the time period in hours between two automatic timed trigger actions of the impact arm. If the value is set to '0', timed automatic triggering of the impact arm does not take place. Automatic triggering is designed to prevent the impact arm from freezing up with poor weather conditions.
Value range:	0-24
Initial value:	12

5.2.2 Command BR

<id>BR<parameter><cr></cr></parameter></id>	Select baud rate.
<id>BR<cr></cr></id>	Query current BR parameter.
Command echo	!xxBRxxxxx <cr> <lf></lf></cr>
Access:	Read / write, release via Command KY necessary.
Description:	The command BR and the parameter xxxxx are used to select the required baud rate. When the baud rate is changed, the ultrasonic bird deflector will return the value of the new baud rate selected in the baud rate previously set to ensure that acceptance of the command remains visible.

When the baud rate is queried with the command BR, the ultrasonic bird deflector returns the baud rate last programmed and the selected parity.

Parameter description:		
	Parameter	Description
	24	2400 baud (8n1)
	48	4800 baud (8n1)
	96	9600 baud (8n1)
	192	19200 baud (8n1)
	384	38400 baud (8n1)
	576	57600 baud (8n1)
Value range:	24, 48, 96, 192, 384, 576	
Initial value:	96	

5.2.3 Command CM

<id>CM<parameter><cr></cr></parameter></id>	Select message with triggering yes/no.
<id>CM <cr></cr></id>	Query current status.
Command echo	!xxCMxxxxx <cr><lf></lf></cr>
Access:	Read / write, release via Command KY necessary.
Description:	Message with triggering of impact arm: <stx>IMPACT ARM TRIGGERED! <etx><cr><lf></lf></cr></etx></stx>

Parameter description:

Parameter	Description
0	No message with triggering
1	Message with triggering

Value range:	0/1
Initial value:	1

5.2.4 Command DM

<id>DM<cr> Demo mode</cr></id>	
Command echo	!xxDM <cr><lf></lf></cr>
Access:	Write.
Description:	This command results in triggering of the impact arm. Triggering takes place with the parameters currently selected.
Parameter description:	
Value range:	
Initial value:	

5.2.5 Command EL

<id>EL<cr></cr></id>	Select event length.
Command echo	!xxELxxxxx <cr><lf></lf></cr>
Access:	Read / write, release via Command KY necessary.
Description:	This command specifies how often the threshold value for slow movements TL must be exceeded in succession to cause triggering of the impact arm. Frequency analysis is performed every 128ms, i.e. a measured value is available every 128ms. If the event length selected is $n=2$, the threshold value for slow movements must be continuously exceeded for 2*128ms=256ms to cause triggering of the impact arm.
Parameter description:	The parameter corresponds to <i>n</i> times the period of 0.128s.
Value range:	1-10
Initial value:	5

5.2.6 Command HC

<id>HC<parameter><cr></cr></parameter></id>	Heating on/off.
<id>HC<cr></cr></id>	Query current status.
Command echo	!xxHCxxxxx <cr><lf></lf></cr>
Access:	Read / write, release via Command KY necessary.
Description:	This command enables or disables the sensor heating.

Parameter description:

Parameter	Description
0	Heating off
1	Heating on

Value range:	0/1
Initial value:	1

5.2.7 Command HH

<id>HH<cr></cr></id>	Display a Help text.
Command echo	Help text.
Access:	Read.
Description:	This command outputs a Help text which displays all valid sensor commands.
Parameter description:	
Value range:	
Initial value:	

5.2.8 Command ID

<id>ID<parameter><cr></cr></parameter></id>	Set identification number.
<id>ID<cr></cr></id>	Query current ID parameter.
Command echo	!xxIDxxxxx <cr><lf></lf></cr>
Access:	Read / write, release via Command KY necessary.
Description:	This command sets the identification number. The 'id' is used in every telegram of the measuring transducer.
Parameter description:	The parameter corresponds to the device ID.
Value range:	0 to 98
Initial value:	0

5.2.9 Command KY

<id>KY<parameter><cr></cr></parameter></id>	Access to configuration of the sensor.
<id>KY<cr></cr></id>	Query current status.
Command echo	!xxKYxxxxx <cr><lf></lf></cr>
Access:	Read / write.
Description:	This command gives access to the sensor configuration. The key which needs to be input as the parameter to allow access to the configuration is "1". Access is automatically reset again after 2 minutes. Access can also be reset again with the parameter 0.
Value range:	0, 1
Initial value:	0

5.2.10 Command LD

<id>LD<cr></cr></id>	Load default parameters.	
Command echo	!xxLD00001 <cr><lf></lf></cr>	
Access:	Read, release via Command KY necessary.	
Description:	This command loads the defaults as the current parameters.	
Parameter description:		
Value range:		
Initial value:		

5.2.11 Command NP	Move to zero position
Command echo	!xxNP <cr><lf></lf></cr>
Access:	-
Description:	This command is used to move to the zero position of the impact arm. The impact arm is driven with a stepper motor. If the impact arm is temporarily blocked, loss of step may occur. To correctly approach the idle position(B) again, the zero position can thus be redetermined. When in operation, the zero position is approached after 5 trigger actions of the impact arm.
Parameter description:	-
Value range:	-
Initial value:	-

5.2.12 Command OH		
<id>OH< CR></id>	Query operating hours.	
Command echo	e.g. !OH000087 <cr><lf></lf></cr>	
Access:	Read.	
Description:	This command queries the total operating time of the device in hours. The total operating time for the device is stored in the flash memory every 24h. With a restart the operating time at the last save is restored.	
Parameter description:	-	
Value range:	-	
Initial value:	-	

5.2.13 Command OR

<id>OR<parameter><cr></cr></parameter></id>	Select output rate for automatic telegram output.
<id>OR<cr></cr></id>	Query the output rate selected for automatic telegram output.
Command echo	!xxORxxxxx <cr><lf></lf></cr>
Access:	Read / write.
Description:	This command sets the output rate for automatic telegram output. If the output rate is set to zero, no telegram will be output.
Parameter description:	This parameter corresponds to the interval in seconds between the output of automatic telegrams.
Value range:	0 to 255
Initial value:	0

5.2.14 Command PA

<id>PA<parameter><cr></cr></parameter></id>	Select the impact position A of the impact arm.	
<id>PA<cr></cr></id>	Query the impact position A selected.	
Command echo	!xxPAxxxxx <cr><lf></lf></cr>	
Access:	Read / write, release via Command KY necessary.	
Description:	This command sets the impact position of the impact arm.	
Parameter description:	This parameter corresponds to the servo travel in degrees between the idle position(B) and the impact position(A).	
Value range:	45 to 180	
Initial value:	180	

5.2.15 Command RS

<id>RS<cr></cr></id>	Reset.	
Command echo	Reset <cr><lf></lf></cr>	
Access:	Release via Command KY necessary.	
Description:	This command forces a restart of the ultrasonic bird deflector.	
Parameter description:		
Value range:		
Initial value:		

5.2.16 Command SF

<id>SF<parameter><cr></cr></parameter></id>	Select impact sequence.	
<id>SF<cr></cr></id>	Query the impact sequence selected.	
Command echo	!xxSFxxxxx <cr><lf></lf></cr>	
Access:	Read / write, release via Command KY necessary.	
Description:	This command can be used to select how often an impact movement is performed with triggering of the impact arm.	
Parameter description:	Number of impacts per triggering action.	
Value range:	1-4	
Initial value:	2	

5.2.17 Command ST

<id>ST<parameter><cr></cr></parameter></id>	Select setpoint temperature for heating control.
<id>ST <cr></cr></id>	Query current status.
Command echo	!xxSTxxxxx <cr><lf></lf></cr>
Access:	Read / write, release via Command KY necessary.
Description:	This command can be used to specify the setpoint temperature for heating control.
Parameter description:	This parameter corresponds to the setpoint temperature for heating control in °C.
Value range:	0 - 25
Initial value:	5

5.2.18 Command SV

<id>SV<cr></cr></id>	Query current software version.	
Command echo	Example: V0.84 <cr><lf></lf></cr>	
Access:	-	
Description:	This command outputs the version of the firmware.	
Parameter description:		
Value range:		
Initial value:		

5.2.19 Command TH		
<id>TH<cr></cr></id>	Select upper threshold (fast movements).	
Command echo	!xxTHxxxxx <cr> Example: V0.84<lf></lf></cr>	
Access:	Read / write, release via Command KY necessary.	
Description:	This command can be used to set the upper threshold for the detection of fast movements. If this threshold is reduced, fast movements (e.g. rain) will be detected earlier.	
Parameter description:		
Value range:	1 - 150	
Initial value:	35	
5.2.20 Command TL		
<id>TL<cr></cr></id>	Select lower threshold (slow movements).	
Command echo	!xxTLxxxxx <cr><lf></lf></cr>	
Access:	Read / write, release via Command KY necessary.	
Description:	This command can be used to set the lower threshold for the detection of slow movements. Increasing this threshold will reduce the sensitivity level: The ultrasonic bird deflector responds to motion less quickly.	
Parameter description:		
Value range:	1 - 60	
Initial value:	5	
5.2.21 Command TR		
<id>TR<parameter><cr></cr></parameter></id>	Request telegram.	
<id>TR<cr></cr></id>	Request a telegram for automatic telegram output.	
Command echo	Telegram currently selected.	
Access:	Read.	
Description:	This command initiates single transmission of the telegram with the measured value. The telegram being requested can be transmitted as the parameter. If no parameter is transmitted, the telegram currently selected is output.	

Parameter description: Value range: Initial value:

Telegram being requested.

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5.2.22 Command WT

id>WT <parameter><cr></cr></parameter>	Waiting time.
<id>KI<cr></cr></id>	Query current status.
Command echo	!xxWTxxxxx <cr><lf></lf></cr>
Access:	Read / write.
Description:	This command can be used to select the waiting time which needs to pass until renewed triggering of the impact arm.
Parameter description:	This parameter corresponds to the waiting time in seconds.
Value range:	5 - 20
Initial value:	5

6 Technical data

General	Operating voltage	24V AC/DC
	Power consumption @ 24V DC	50mA (waiting, heating off) max. 1.5A
	Opening angle radar module	70° / 70°
Serial interface	Туре	RS485
	Mode	Half-duplex mode
	Data format	8N1
	Baud rate	2400, 4800, 9600, 19200, 38400, 57600
Switching output	Туре	Semiconductor relay
	Maximum voltage	24V AC / DC
	Maximum switching current	0.5A
Ambient conditions	Temperature range	-30 +60°C
	Humidity range	Non-condensing
Housing	Material	Polycarbonate
	Dimensions	see Dimension drawing
	Weight	1.5kg, incl. 20m Cable
	Type of protection	IP67
	Type of connection	0.2m cable LIYCY 7x0.25mm ² , with 8-pol. Connector

7 Dimension drawing [in mm]



8 EC-Declaration of Conformity

Document-No	.: 000650	Month: 10 Year: 15
Manufacturer	: ADOLF TH Hauptstr. 76 D-37083 Göttingen Tel.: (0551) 79001-0 Fax: (0551) 79001-65 email: Info@ThiesClima.c	IES GmbH & Co. KG
This declaration	of conformity is issued under	r the sole responsibility of the manufacturer
Description of	Product: US-bird deflect	or
Article No.	4.3800.90.000	
specified technic	cal data in the document:	021762/10/15
The indicated proc	lucts correspond to the essential	requirement of the following European Directives and Regulations:
2004/108/EC	DIRECTIVE 2004/108/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility and repealing Directive 89/336/EEC	
2006/95/EC	DIRECTIVE 2006/95/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 12 December 2006 on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits	
552/2004/EC	Regulation (EC) No 552/2004 of the European Parliament and the Council of 10 March 2004 on the interoperability of the European Air Traffic Management network (the interoperability Regulation)	
2011/65/EU	DIRECTIVE 2011/65/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment	
The indicated proc	lucts comply with the regulations	of the directives. This is proved by the compliance with the following standards:
EN 61000-6-2	Electromagnetic compatibility Immunity for industrial environment	
EN 61000-6-3	Electromagnetic compatibility Emission standard for residential, commercial and light industrial environments	
EN 61010-1	Safety requirements for electrical equipment for measurement, control, and laboratory use. Part 1: General requirements	
EN 50581	Technical documentation for th of hazardous substances	e assessment of electrical and electronic products with respect to the restriction
Place: Göttinge	n	Date: 20.10.2015
Legally binding signature: issuer:		
		Bel
Wolfgang Behrens, General Manager Joachim Beinhorn, Development Manager		

This declaration certificates the compliance with the mentioned directives, however does not include any warranty of characteristics. Please pay attention to the security advises of the provided instructions for use.



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