



BOSCH CONNECTED INDUSTRY

CONNECT S2 GATEWAY SOLAR FRAME

User Guide

Connected Products and Services
Nexeed Track and Trace

Version 1.19

Content

1	Hints for This Document.....	5
2	Introduction	6
3	General information.....	7
4	Sets, accessories, mounting material and ordering information	8
	<i>Set: Connect S2 Bundle E.....</i>	<i>8</i>
	<i>Device: Connect S2 solo</i>	<i>8</i>
	<i>Set: Solar Frame.....</i>	<i>9</i>
	<i>Accessories: Mounting set 0 mm – 3 mm.....</i>	<i>9</i>
	<i>Accessories: Mounting set 4 mm – 13 mm.....</i>	<i>9</i>
	<i>Accessories: Adhesive set AT-8040.....</i>	<i>10</i>
	<i>Accessories: Cartridge gun Köratool PM207</i>	<i>10</i>
	<i>Accessories: Power supply US.....</i>	<i>10</i>
	<i>Spare part: Power supply Europe.....</i>	<i>11</i>
	<i>Spare part: Power supply adapter</i>	<i>11</i>
	<i>Spare part: Screw set for Solar Frame</i>	<i>11</i>
5	Functions and configurations	12
	<i>Sensor scan.....</i>	<i>12</i>
	<i>Sensor scan and upload intervals</i>	<i>12</i>
	<i>Battery stretch function</i>	<i>13</i>
6	Activation and coupling of the Connect S2	14
	<i>Activation</i>	<i>14</i>
	<i>Coupling.....</i>	<i>14</i>
7	Mounting.....	15
	<i>General safety instructions for installation.....</i>	<i>15</i>
	<i>General instructions for installation</i>	<i>15</i>
	<i>Mounting with magnets.....</i>	<i>16</i>
	<i>Mounting with M8 screws</i>	<i>17</i>
	<i>Mounting instructions for Solar Frame.....</i>	<i>18</i>
	<i>Usage of adhesive AT-8040.....</i>	<i>19</i>
	<i>Mounting with Solar Frame, glued.....</i>	<i>20</i>
	<i>Mounting with Solar Frame, glued on backside</i>	<i>22</i>
	<i>Mounting with Solar Frame, screwed</i>	<i>23</i>
8	Operation and maintenance	24
9	Support	24
10	Technical data	25
	<i>Gateway Connect S2.....</i>	<i>25</i>

	<i>AC power supply</i>	26
	<i>Solar Frame</i>	27
	<i>Operating conditions</i>	27
11	Handling and transport	28
	<i>Battery</i>	28
	<i>Magnets (only Connect S2 Bundle, 3843.AX5.574)</i>	28
	<i>Transport regulations road/rail/sea freight</i>	28
	<i>Use as tracking device or gateway in a road/rail/sea freight transport</i>	29
	<i>Air transport PAO/CAX</i>	30
	<i>Use as a tracking device or gateway in air freight PAO/CAX</i>	30
12	Disposal	31
	<i>Disposal according to the WEEE Directive 2012/19/EU</i>	31
13	Certifications and regulatory Notes	32
	<i>EU-Declaration of Conformity</i>	32
	<i>Operating the device in countries out of the EU</i>	32
	<i>Export Restrictions</i>	32
	<i>Federal Communications Commission (FCC) Notice</i>	32
14	Intended Use	33
15	Safety notes	34
	<i>Safety instructions for the integrated battery</i>	34
	<i>Safety instructions for installation</i>	34
	<i>Safety instructions for mounting with magnets</i>	34
	<i>Safety instructions for handling the mounting magnets</i>	35
	<i>Safety instructions for mounting with Solar Frame</i>	36
16	Third-Party Licenses and Components	37

1 Hints for This Document

Meaning of the used signal words

DANGER!



Indicates risk situations and threats to the life and health of individuals. Failure to comply with this warning can lead to life-threatening situations.

► These instructions must be obeyed.

WARNING



Indicates a hazardous situation in which the user must act as indicated.

► These instructions must always be followed.

CAUTION



Indicates precautionary measures or/and a hazard that may result in minor or moderate injury.

► These instructions should always be observed.

Meaning of Info and Tip

INFO



General information and/or instructions.

► These instructions must be observed.

TIP



Practical hints.

2 Introduction

Bosch Nexeed Track and Trace is a complete solution for tracking, locating and monitoring large and small objects.

The Nexeed Gateway Connect S2 is a tracking device for mobile use on larger objects and vehicles and for stationary use by mounting inside and outside buildings. For this purpose, the Connect S2 is equipped with integrated satellite positioning (GNSS), a modern mobile radio interface and a powerful battery for autonomous operation.

At the same time, the Connect S2 is able to transmit the data from smaller tracking sensors (Sense I, Sense T, Sense S, Sense H¹) of the Nexeed solution.



Features:

- very compact, no maintenance required
- extremely resistant, suitable for harsh environments
- Location determination based on GPS and GSM
- Receive and transmit data for Sense I, Sense S, Sense T, Sense H and optionally for tags and sensors of third parties

The Connect S2 Gateway is offered with the following features:

- Device operation
- Device Monitoring
- Mobile connectivity
- Firmware updates
- Security updates
- Configuration sets based on use cases and requirements

¹ Sense S, Sense T and Sense H are other devices of the Nexeed Track and Trace system.

3 General information

Before using the Connect S2 Gateway, please familiarize yourself with the [Safety notes](#) on page 34. It is important to observe the safety instructions to ensure safe installation, operation and disposal.

Various accessories and mounting materials are available for the Connect S2 Gateway for many different applications. The chapter [Sets, accessories, mounting material and ordering information](#), page 8, provides an overview of all options.

The Connect S2 supports a variety of functions and configuration options. Bosch delivers pre-set Connect S2 to the customer to make commissioning as easy and quick as possible. When ordering, the customer selects the desired configuration of the Connect S2, see chapter [Functions and configurations](#), page 12.

We recommend that the unit be switched on before installation. Follow the instructions for [Activation and coupling of the Connect S2](#) the Connect S2 on page 14.

There are various options for mounting the Connect S2 on a moving object or at a fixed location. Depending on the location and the local conditions, different mountings are possible. Details are described in chapter [Mounting](#) on page 15.

The Connect S2 works self-sufficiently and largely maintenance-free. The instructions for [Operation and maintenance](#), page 24, should be observed.

For questions and if help is required, there is a [Support](#), page 24.

An overview of all technical data for the Connect S2 Gateway and the solar support (accessories) can be found in the chapter [Technical data](#), page 25.

For greater safety, the Connect S2 uses an integrated battery with lithium iron phosphate technology (LiFePO₄). As this is lithium technology, the current regulations for [Handling and transport](#), page 28, must nevertheless be observed during handling, transport and use.

At the end of use, the Connect S2 must be correctly disassembled and returned. All details are described in chapter [Disposal](#), page 31.

When using a Connect S2, the legal requirements of the respective countries of use must be observed and the intended use must be observed, see chapters [Certifications and regulatory Notes](#), page 32 and [Intended Use](#), page 33.

4 Sets, accessories, mounting material and ordering information

Set: Connect S2 Bundle E

Set for use in stationary operation or for interim recharging via mains adapter, for use in Europe only.

Order number: 3843.AX5.574

Quantity	Product	Picture
1	Gateway Connect S2	
1	AC power supply 230 V (Euro connector)	
2	Mounting magnets	
2	Screws M8 x 15 mm	
2	Spring washers	
1	Power supply adapter	

Device: Connect S2 solo

Single device for use with the Solar Frame or as a replacement.

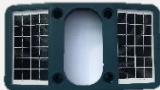
Order number: 3843.AW2.504

Quantity	Product	Picture
1	Gateway Connect S2	

Set: Solar Frame

The Connect S2 Gateway can be integrated into the Solar Frame (with 2 solar cells) and together with this results in a solar-powered self-sufficient tracking device. For this set you need the single device Connect S2 described above.

Order number: 0804.GV5.750

Quantity	Product	Picture
1	Solar Frame 2-cell	
4	Washer DIN 522 stainless steel A2 blank 6.4 x 35 x 1.5 mm	
4	Flange nuts self-locking DIN 6926 A2 M5	
4	Plugs	

Accessories: Mounting set 0 mm – 3 mm

The set is used to fix the Solar Frame on a carrier (gluing) or through a carrier with a thickness of up to 3 mm (screwing through).

Order number: 3843.AY0.451

Quantity	Product	Picture
4	Gluing studs M5 x 15 mm	

Accessories: Mounting set 4 mm – 13 mm

The set is used to fix the Solar Frame on a carrier (gluing) or through a carrier with a thickness of 4 mm up to 13 mm (screwing through).

Order number: 3843.AY0.452

Quantity	Product	Picture
4	Gluing studs M5 x 25 mm	

Accessories: Adhesive set AT-8040

The adhesive set is required for the mounting sets 0 mm – 3 mm and 4 mm – 13 mm.

Order number: 0804.GV5.751

Quantity	Product	Picture
4	Static mixer	
1	Cartridge adhesive AT8040	

CAUTION



Observe the information on storage temperature and the expiry date of the adhesive on the adhesive cartridge.

- ▶ Store the adhesive cool at the specified temperature.
- ▶ Do not use the adhesive once the expiry date has passed.
- ▶ Do not use the adhesive if it is difficult to press it out of the cartridge.

Accessories: Cartridge gun Köratool PM207

The cartridge gun Köratool PM207 is required to press the adhesive out of the cartridges. The tool is reusable.

Order number: 3843.AY0.455

Quantity	Product	Picture
1	Köratool PM 207	

Accessories: Power supply US

The power supply is required for use in countries with US plug and 110 V mains voltage, only for use in the USA and Canada.

Order number: 3843.AY0.456

Quantity	Product	Picture
1	AC power supply 110 V (US connector) ²	

² Indoor use only.

Spare part: Power supply Europe

The power supply unit is intended for use in countries with Euro connector and 230 V mains voltage. It corresponds to the power supply in the Connect S2 Bundle.

Order number: 3843.AY0.457

Quantity	Product	Picture
1	AC power supply 230 V (Euro connector) ³	

Spare part: Power supply adapter

The power supply adapter is used to connect the power supply to the M8 connector of the Connect S Gateway.

Order number: 3843.AY0.460

Anzahl	Produkt	Abbildung
1	Power supply adapter	

Spare part: Screw set for Solar Frame

If it is necessary to dismount the Solar Frame, for example when replacing the gateway, new flange nuts must always be used. This set contains the necessary spare parts

Order number: 0804.GV5.752

Quantity	Product	Picture
4	Washer DIN 522 stainless steel A2 blank 6.4 x 35 x 1.5 mm	
4	Flange nuts self-locking DIN 6926 A2 M5	
4	Plugs	

Contact Nexeed Track and Trace for further information on sales and support at the following e-mail address:

sales.tnt@de.bosch.com .

³ Indoor use only.

5 Functions and configurations

The Connect S2 is delivered fully configured. No further configuration is required for assembly/commissioning.

If you wish to change the device configuration after delivery, please contact the support. All configuration settings can be adjusted by the support team via remote maintenance.

Sensor scan

During operation, the Connect S2 performs a sensor scan at regular intervals on the frequency 2.4 GHz. All detected sensors are filtered for compatible sensors directly in the device and duplicate data is removed.

The Connect S2 can acquire up to 1,500 sensors in one scan.

With each scan, a position determination based on GPS or cell ID is performed simultaneously. The data block generated from sensor data and position is stored in the device until the next successful transfer to the server (upload).

If no mobile communication connection is possible, the Connect S2 is able to buffer the data (depending on scan interval and number of sensors) for many days, weeks or even months until the next successful upload.

Sensor scan and upload intervals

The Connect S2 works with fixed combinations of

- Sensor Scan interval
- Sensor scan duration
- Data Upload interval

Example:

Operation mode when set to configuration #5	
Sensor scan and position determination	every 5 min
Scan duration	35 s
Data upload to server	every 10 min

TIP



Over 50 different configurations are available. The smallest interval is 3 minutes.
Please contact our Nexeed Track and Trace support at the following e-mail address:
support.tnt@de.bosch.com

Battery stretch function

In order to ensure the monitoring of the Connect S2 and a minimum of tracking functionality even with low batteries, the gateways have a battery stretch function. This function increases (stretches) the sensor scan and upload intervals set via the configuration in three steps.

With the battery stretch function, the upload and scan intervals currently configured for this gateway are extended by a factor (i.e. multiplied) if the battery charge level falls below a configurable level (in percent).

The thresholds for the battery charge level can be adjusted or the function can be switched off completely by the support team at the customer's request.

The default settings for this function are:

Level	When reaching battery charge level	Factor for upload interval	Factor for scan interval
Battery-Stretch 1	20 %	*2	*1
Battery-Stretch 2	10 %	*4	*2
Battery-Stretch 3	5 %	*8	*2

Example:

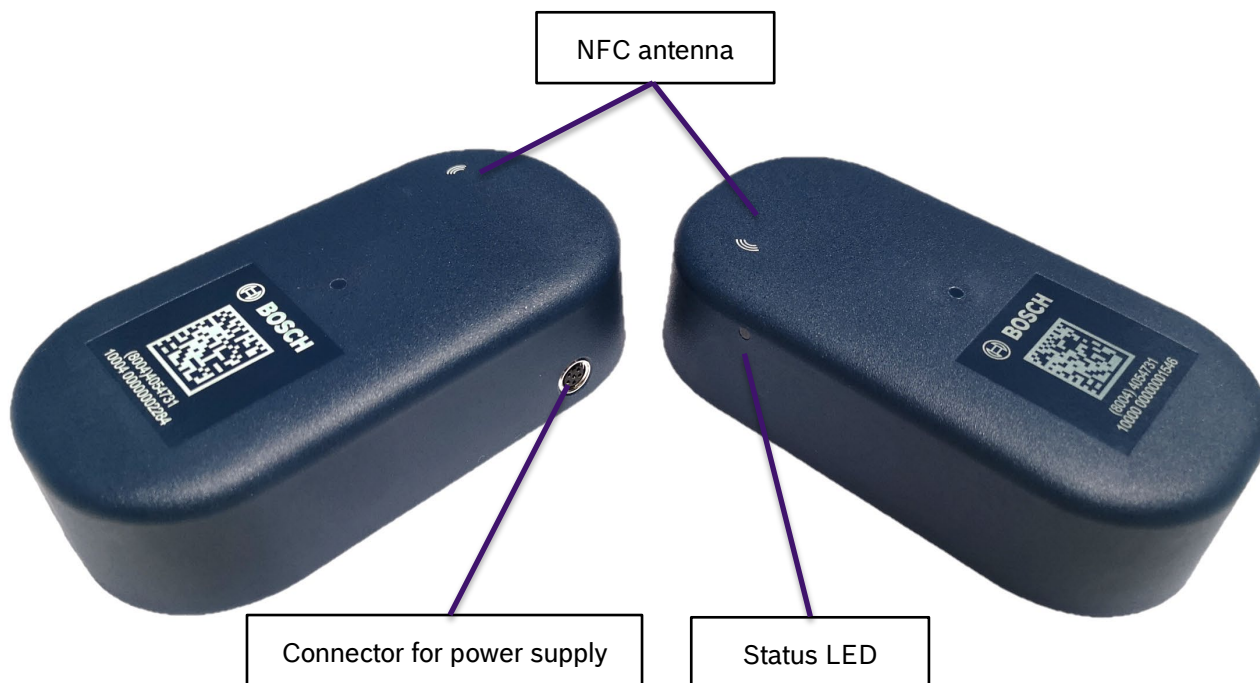
Gateway configuration set to:		
Sensor scan and position determination:		every 3 min
Data upload to server:		every 3 min
Battery-Stretch 1: at battery level of 20%... 11%:		
Sensor scan and position determination:		every 3 min
Data upload to server:	every 3 min x 2 =	every 6 min
Battery-Stretch 2: at battery level of 10%... 6%:		
Sensor scan and position determination:	every 3 min x 2 =	every 6 min
Data upload to server:	every 3 min x 4 =	every 12 min
Battery-Stretch 3: at battery level of 5%... 0%:		
Sensor scan and position determination:	every 3 min x 2 =	every 6 min
Data upload to server:	every 3 min x 8 =	every 24 min

6 Activation and coupling of the Connect S2

Activation

To activate a new Connect Gateway, hold an active NFC scanning device against the housing. The gateway starts automatically and connects to the Bosch server to download firmware and perform configuration. The status LED flashes red for 1 second and green for 1 second when the device is powered up via NFC.

After activation (red/green flashing of the LED) or if the Connect S2 is connected to the charger when the battery is empty, the gateway needs a few minutes to start up. The device status is only signalled by LED after the startup.



Coupling

Use the mobile apps provided by Bosch Connected Industry to link (couple) the Connect Gateway to your asset. The apps can read the unique ID, which is encoded in a QR code on the gateway, and transmit this information to the Bosch server along with your asset ID.

7 Mounting

Mounting options

Depending on the application, there are various solutions for attaching the Connect S2 to an object.

- Mounting with magnets on stationary metallic objects
- Mounting with M8 screws
- Mounting with Solar Frame, screwed with M5 screws
- Mounting with Solar Frame, glued to surfaces
- Mounting with Solar Frame, glued on the backside

General safety instructions for installation

WARNING



Attaching the device may cause damage to persons or property.

- ▶ Only use the device if it can be ruled out that the method of attachment will cause damage to persons or property.



The permanent fixation for the respective application must be ensured. Only use the device if the method of attachment rules out the possibility of personal injury or damage to property.

- ▶ Have the installation carried out by qualified personnel only.

CAUTION



The supplied mounting material (nuts, washers, etc.) is used to correctly mount the Solar Frame and gateway.

- ▶ Only use the supplied mounting material.



The substrate must be level and must not be heavily soiled so that the Solar Frame rests evenly.

- ▶ Make sure the surface is flat and clean.

General instructions for installation

TIP



It is recommended to switch on the device before mounting.

- ▶ Proceed as described in [chapter 6, Activation and coupling of the Connect S2](#).

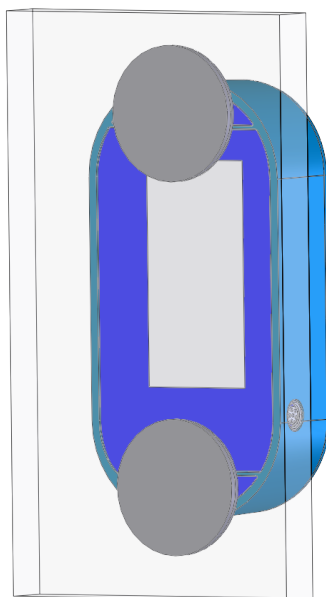


The radio antennas required for the functions of the Connect S2 are located under the device surface (below the data matrix code). For optimum function, these antennas must not be covered by metal objects.

Mounting with magnets

No tools are required.

Attach the gateway to a metal surface. Use the two neodymium magnets supplied to attach the gateway.



- Screw the magnets hand-tight completely into the housing
- Carefully attach the device to a metal object with magnets
- Check the device for secure fixing

CAUTION



For safety reasons, attachment with magnets is only permitted up to a maximum height of 2 meters.

- ▶ Observe the maximum height of 2 m.
- ▶ Select an alternative mounting method for higher mounting positions.

WARNING



When mounting on vehicles, mobile machines or other moving objects, high accelerations can affect the device. In these cases, mounting the device with the mounting magnets is not permitted.

- ▶ DO NOT attach the gateway to the outside of moving objects such as trucks, trailers, cars or other vehicles using the magnets.

TIP



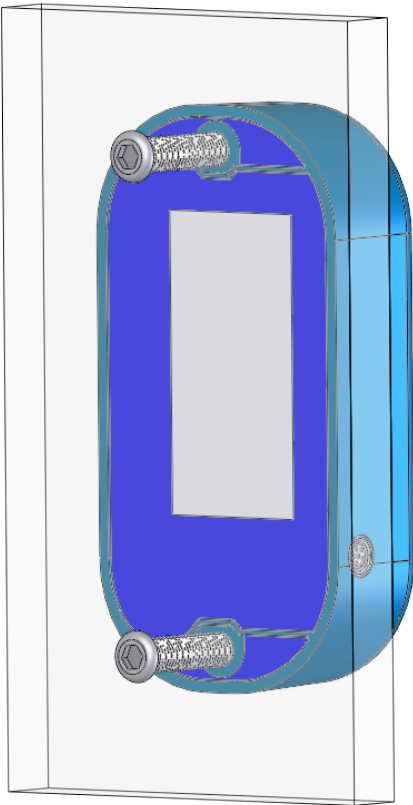
When handling the mounting magnets, please also observe the corresponding safety instructions, see chapter **Safety notes** at **page 34**.

Mounting with M8 screws

Fasten the gateway at a suitable location using two M8 screws.

For a material thickness of the mounting plate of 1 mm ... 5 mm, the supplied screws can be used. Alternative screws must be used for material thicknesses of more than 5 mm.

Use the spring washers supplied to secure the screws. Screw the screws from below into the threads provided on the gateway housing. See the following picture:



Mounting parameters:	
Screw tightening torque	5 Nm to 7 Nm
Screw-in depth in the Gateways housing	min. 10 mm to max. 14 mm

Mounting instructions for Solar Frame

CAUTION



The supplied mounting material (nuts, washers, etc.) is used to correctly mount the Solar Frame and gateway.

- ▶ Only use the supplied mounting material.



The flange nuts supplied are specially selected for mounting the Solar Frame and must only be used ONCE. If the Solar Frame must be dismantled, always use new flange nuts.

- ▶ Only use the flange nuts supplied.
- ▶ Use them only once. No multiple use.



The solar cells in the Solar Frame can be damaged by a fall. It is solar glass.

- ▶ Pay attention to safe handling when mounting the solar frame and avoid a fall of the Solar Frame.
- ▶ Replace a damaged Solar Frame.

TIP



It is recommended that you first plug the Solar Frame connector into the gateway and tighten it before inserting the gateway into the Solar Frame.

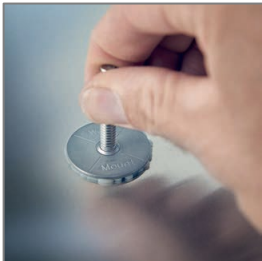
Usage of adhesive AT-8040



CAUTION

Observe the information on storage temperature and the expiry date of the adhesive on the adhesive cartridge.

- ▶ Store the adhesive cool at the specified temperature.
- ▶ Do not use the adhesive once the expiry date has passed.
- ▶ Do not use the adhesive if it is difficult to press it out of the cartridge.

Step	Instruction	Picture
1	Insert the 2-K cartridge into the gun Köratool PM 207 and attach the Köratool static mixer.	
2	Clean the surface and the glue studs fastener with Scotchbrite and a solvent-based cleaner.	
3	Apply a small amount of adhesive to the bottom of the glue stud.	
4	Press the fixing element firmly onto the substrate until the adhesive swells out to the sides. Depending on the selected adhesive, the fastener can be used within 15 to 45 minutes.	

Mounting with Solar Frame, glued

The Solar Frame can be glued directly onto a smooth, flat surface using the mounting set 0 mm - 3 mm.

INFO



Follow the instructions for **using the AT-8040 adhesive** in this chapter!

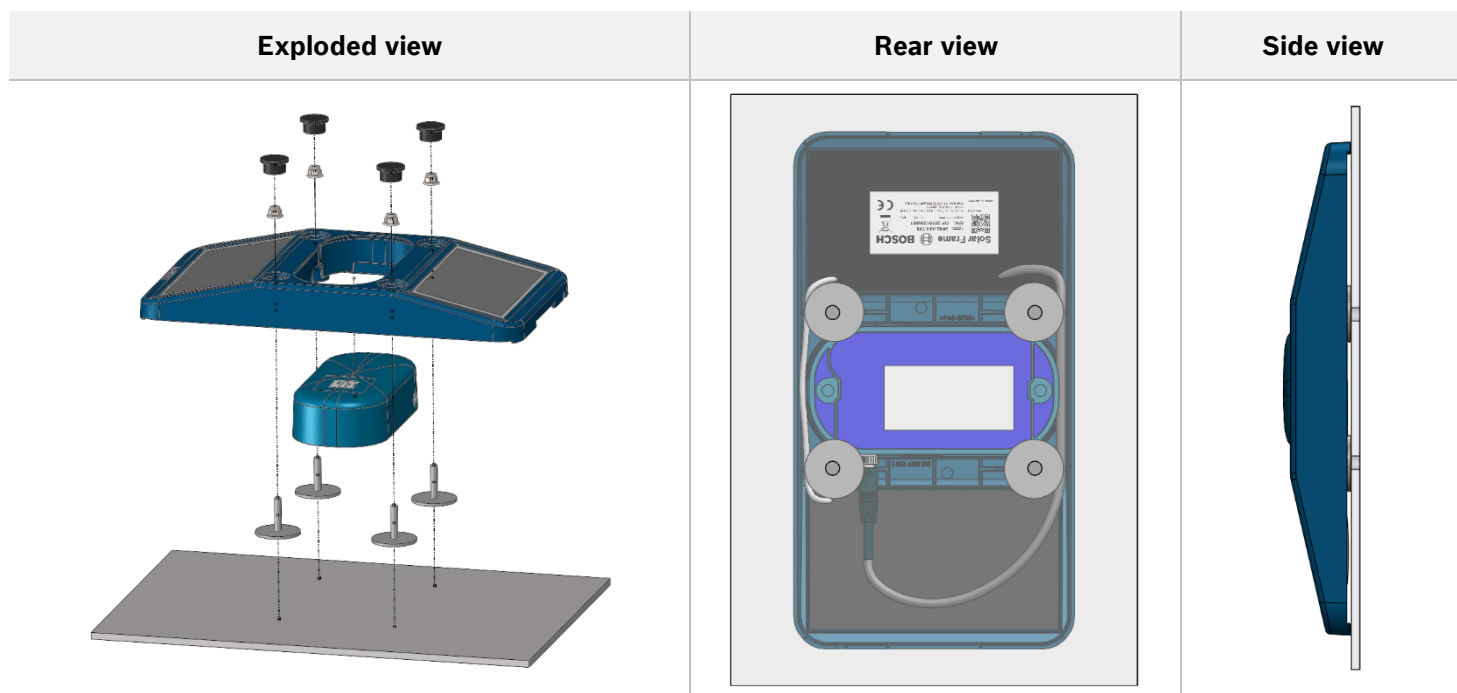


Direct gluing of the Solar Frame is only permitted on the materials listed below

Manufacturer	Material
	Aluminum, unpainted/uncoated
	Stainless steel, unpainted/uncoated
Lamilux	High Impact HG 4000 Fabric 48%
Optiplan-Polydet	High Gloss Performance plus Standard plus PowerStar EP
Vetroresina	G60/30 Gloss sanded standard
Schmitz Cargobull	Cover sheet – outside Cover sheet – inside (PVC)
Kögel	Cover sheet – outside
Krone	Cover sheet – outside
Kiesling	Cover sheet – outside Cover sheet – inside

Assembly steps:

1. Activate gateway
2. Connect Solar Frame connector to gateway
3. Insert the gateway into the Solar Frame from below
4. Mount the glue studs with flange nuts, tighten flange nuts hand-tight.
5. Close the screw holes with the plugs supplied
6. Prepare the surface according to the gluing instructions
7. Apply adhesive
8. Gluing the Solar Frame
9. Wait until the adhesive has cured before loading
10. Check that all four mounting points hold the Solar Frame



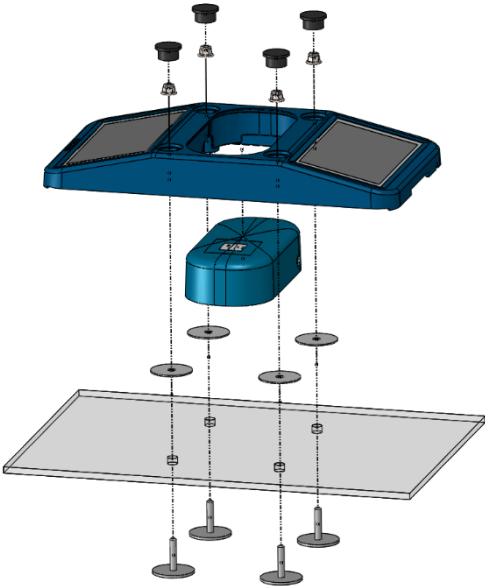
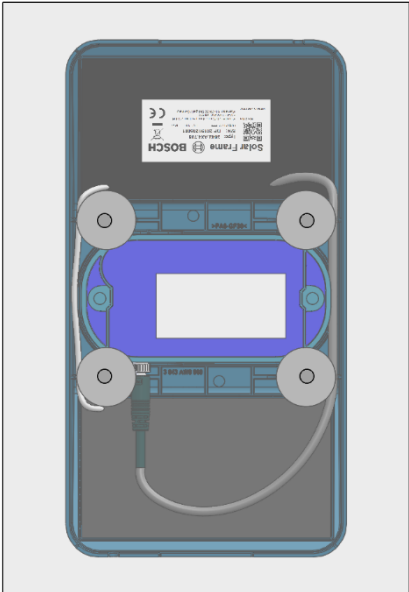
Mounting with Solar Frame, glued on backside

INFO	
	The mounting material supplied is suitable for a carrier plate with a material thickness of 1 mm to 13 mm. • The mounting holes are sealed with the supplied adhesive. • This type of installation can be carried out by one person.
	Follow the instructions for using the AT-8040 adhesive in this chapter!

Mounting parameters:		
Thickness of the mounting surface	1 mm to 3 mm 4 mm to 13 mm	Mounting set 0 mm – 3 mm Mounting set 4 mm – 13 mm
Tightening torque of the flange nuts M5	hand-tight	

Mounting steps:

1. Mark holes using the Solar Frame
2. Drill holes
3. Fix the gluing studs according to the gluing instructions
4. Wait for the adhesive to harden
5. Activate gateway
6. Connect Solar Frame connector to gateway
7. Insert the gateway into the Solar Frame from below
8. Mount the supplied washers
9. Mounting according to exploded view
10. Check that all four mounting points hold the Solar Frame
11. Close the screw holes with the supplied plugs

Exploded view	Rear view	Side view
		

Mounting with Solar Frame, screwed

INFO



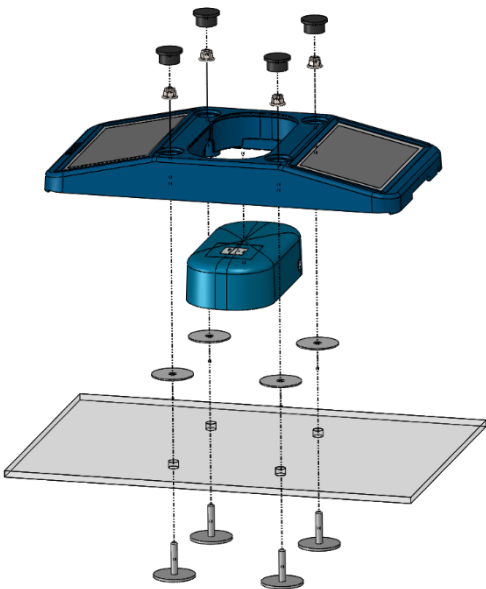
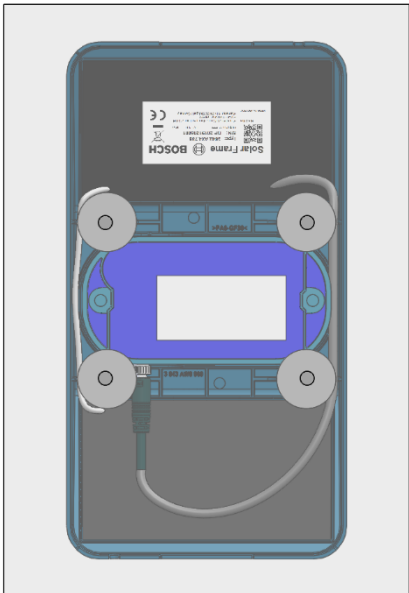
- ▶ Use screws with a diameter of 5 mm for mounting. The length of the screws must be selected according to the thickness of the support plate.
- ▶ Use stainless steel (V2A, V4A) screws suitable for the application and sufficiently strong.

Mounting parameters:

Length of the screws	Thickness of carrier plate + 13 mm to 18 mm
Tightening torque of the flange nuts M5	hand-tight

Mounting steps:

1. Mark holes with the help of the Solar Frame
2. Drill holes
3. Activate gateway
4. Connect Solar Frame connector to gateway
5. Insert the gateway into the Solar Frame from below
6. Screws M5 with the length: material thickness + 13 mm to 18 mm
7. Mount the supplied washers
8. Screw the Solar Frame hand-tight with the four flange nuts supplied
9. Check that all four mounting points hold the Solar Frame
10. Close the screw holes with the supplied plugs

Exploded view	Rear view	Side view
		

8 Operation and maintenance

Device Status

Device status information can be taken from the status LED:

	LED signal		Battery status
 → 1s → 	Blinking green	Interval of 1 s	The device is in standby mode.
 → 1s → 	Blinking red	Interval of 1 s	The device is in operation: scanning, position determination or uploading data.
 → 15s → 	Blinking red	Interval of 15 s	The battery is almost empty. The device is in battery saving mode. No operation is possible.
 → 30s → 	Blinking green	Interval of 30 s	The device is switched off. No operation. Battery okay. Start the device via NFC activation.
 → 30s → 	Blinking red	Interval of 30 s	The device is switched off. No operation. The battery is almost empty. The device can be started after charging.
	No signal	-	The battery is empty. The device is offline. Charge the device.
	Green	constant	Power supply with ≥ 18 VDC connected. The battery is charging. Battery status > 90%.
	Red	constant	Power supply with ≥ 18 VDC connected. The battery is charging. Battery status < 90%.

Maintenance

The Connect Gateway is maintenance-free. When using the Solar Frame, we recommend an annual cleaning of the solar cells with water and a mild detergent necessary to maintain the full performance of the solar cells.

Switch off

The Connect Gateway has no shutdown switch. The device can only be switched off remotely by support.

INFO



Connect Gateways must be switched off during flight!

9 Support

For further questions please contact Nexeed Track and Trace support at the following e-mail address:
support.tnt@de.bosch.com

10 Technical data

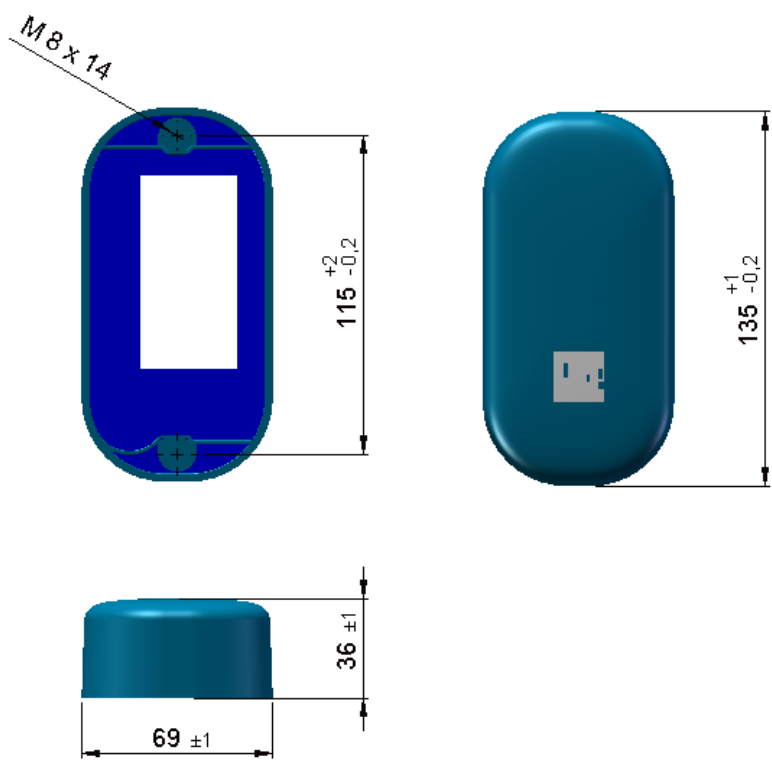
Gateway Connect S2

Dimensions (L x W x H)	136 mm x 69 mm x 36 mm	
Weight	ca. 480 g	
Power supply	Lithium Iron Phosphate (LiFePO ₄) 3.2 V 6.8 Ah 21.76 Wh	
Battery life	1800 to 5000 Uploads ⁴	
Localization	- GNSS: Global Positioning System (GPS) - A-GPS: supported - Cell ID localization: Premium Cell Locate	
Technology	IEEE 802.15.1 2.4 GHz	
Protocol	Proprietary, RX only	
Range	> 50 m free line of sight	
Scan interval	configurable	
Scan duration	configurable	
Charging voltage	8 V to 24 V $\overline{\text{---}}$ (DC) Cable length max. 3m	LPS required ⁵
Charge time	ca. 12 h to full charge	
Data buffering capacity	> 200000 data sets	
Maximum number of sensors in range	1500	
Cellular Connectivity	2G GSM/GPRS 850 / 900 / 1800 / 1900 MHz - LTE Cat M1 (optional: Narrow Band IoT) EU: B3 / B8 / B20 USA / Kanada: B2 / B4 / B5 / B12	
SIM	Integrated SIM chip	
RF output power	GSM850 / EGSM900 DCS1800 / PCS 1900 LTE-FDD B2 / B3 / B4 / B5 / B8 / B12 / B20	33 dBm 30 dBm 23 dBm
Housing material	PA6GF30	
IP protection class	IP67 (with connector mounted)	

⁴ Based on ambient temperature +25°C and good mobile radio conditions. Depending on configuration, quantity of sensors and operating conditions.

⁵ The external voltage source used to operate the device must meet the requirements for LPS ("limited power source") according to IEC/EN 60950-1, section 2.5 or IEC/EN 62368-1, Annex Q.

Connection cable length	up to 3 m length	
Certifications	RoHS, CE, FCC, ISED, EN50155	others on request

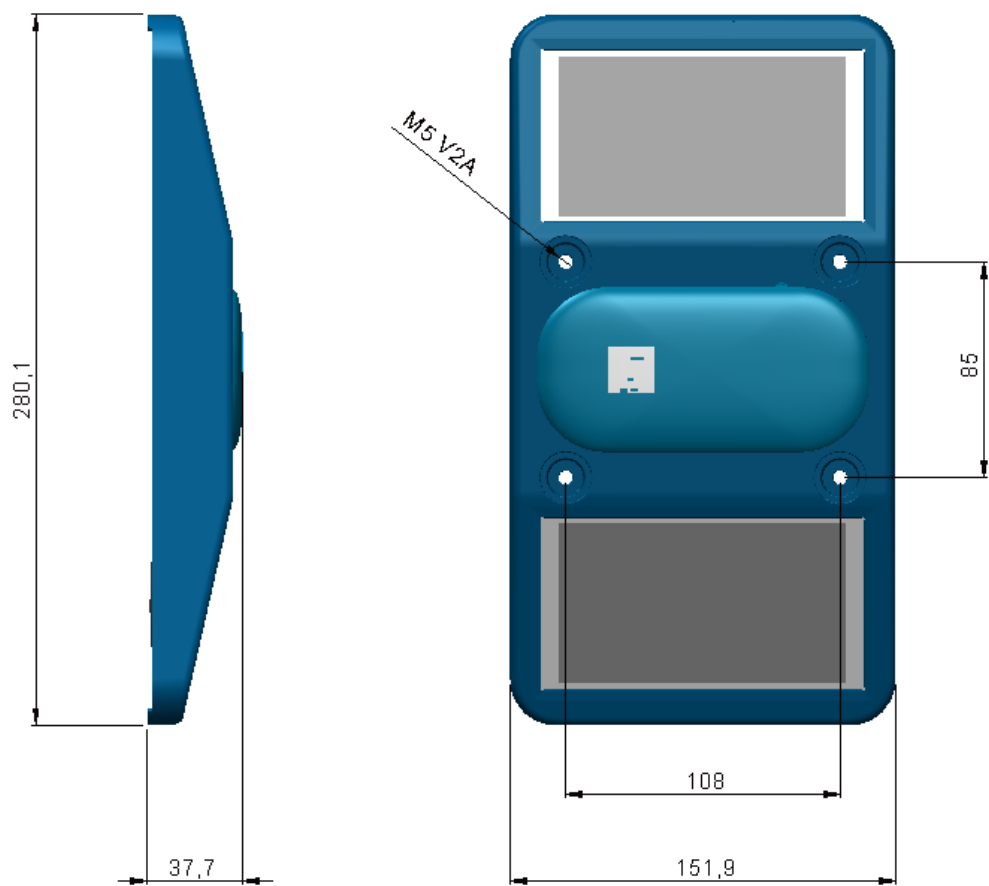


AC power supply

Variants	3843.AY0.457 3843.AY0.456	Power supply 230 V (Euro connector) Power supply 110 V (US connector)
Output	24 V – (DC) 0 to 0.5 A 12 W	
Input	90 to 264 VAC	
Working temperature	-20 °C to +60 °C	
Working humidity	20% to 90% rH (non-condensing)	
IP protection class	IP22	indoor use only
Note	Observe the data on the nameplate or the installation instructions and the manufacturer's data sheet.	

Solar Frame

Dimensions (L x W x H)	300 mm x 152 mm x 41.1 mm
Weight	680 g
Solar cell output power	2.3 Wp
Voltage	11.5 V $\Rightarrow$ (DC)



Operating conditions

Operating temperature	-20 °C to +75 °C
Charging temperature	0 °C to 45 °C (integrated protection circuit)
Storage temperature	+10 °C to +30 °C
Storage time	6 months
Humidity	20% rH to 100% rH (non-condensing)

11 Handling and transport

Connect S2 solo	3843.AW2.504
Connect S2 Bundle	3843.AX5.574

Battery

Battery type	Lithium iron phosphate, LiFePO ₄
Energy content	21,76 Wh
Weight of battery	approx. 166 g
Transport tests	according to part III, subsection UN38.3

Magnets (only Connect S2 Bundle, 3843.AX5.574)

CAUTION



Postage

Magnetic fields of improperly packaged magnets could cause disturbances in sorting machines and damage fragile goods in other packages.

- ▶ Use a large box and place the magnet in the middle surrounded by lots of padding material.
- ▶ Arrange magnets in a package in a way that the magnetic fields neutralize each other.
- ▶ If necessary, use sheet iron to shield the magnetic field.
- ▶ There are stricter rules for airfreight: Refer to the warning notice "Airfreight".



Airfreight

Magnetic fields of improperly packaged magnets could influence airplane navigation devices. In the worst case it could lead to an accident.

- ▶ Airfreight magnets only in packaging with sufficient magnetic shielding.
- ▶ Please refer to the respective regulations.

Transport regulations road/rail/sea freight

UN classification	• Road: UN 3481 Lithium Ion Battery contained in equipment, 9 (E) • Rail: 90 UN 3481 Lithium Ion Battery contained in equipment, 9 • Ocean: UN 3481 Lithium Ion Battery contained in equipment, 9
Instructions	• ADR/RID SV 188 • IMDG Code SP 188 • Application of SV188 / SP 188, due to energy contained < 100 Wh
Packaging	Protection of battery by housing of device and potting of battery. No special packaging requirements.
Marking	Lithium battery mark UN 3481, if more than 2 devices per package and more than 2 packages per consignment.



Not applicable if no more than two batteries (devices) per package and if there are no more than two packages in the consignment.

Marking ocean freight containers	No marking required.
Documentation	No documentation required.
Miscellaneous	Personnel shall be trained commensurate with responsibilities.

Use as tracking device or gateway in a road/rail/sea freight transport

UN classification	- Road: UN 3481 Lithium Ion Battery contained in equipment, 9 (E) - Rail: 90 UN 3481 Lithium Ion Battery contained in equipment, 9 - Ocean: UN 3481 Lithium Ion Battery contained in equipment, 9
Instructions	- Exemption according to 1.1.3.7 ADR/RID - IMDG Code SP 188 - Application of SP 188, due to energy contained < 100 Wh
Packaging	Protection of battery by housing of device and potting of battery. No special packaging requirements.
Marking	- Up to 2 batteries (devices) per package: no battery handling label required.  - More than 2 batteries (devices) per package: battery handling label required.
Marking ocean freight containers	No marking required.
Documentation	No documentation required.
Miscellaneous	Personnel shall be trained commensurate with responsibilities.

Air transport PAO/CAX

INFO



Use in aircraft

The transport of Connect S Gateways in an aircraft is basically only permitted when the device is switched off or in sleep mode (battery empty).

- Make sure that a Connect S2 is switched off during transport in an aircraft.

UN classification	UN 3481 Lithium Ion Battery contained in equipment, 9
Instructions	• IATA PI 967 Section II • The requirements for UN 3481 lithium-ion batteries in equipment, 9 Section II of Packing Instruction 970 are the same between PAX and CAO. • Application of section II of PI 967 IATA possible due to energy contained < 100 Wh. • PAX/CAO: 5 kg net battery weight per package
Packaging	Protection of battery by housing of device and potting of battery. No special packaging requirements.
Marking	• Up to 2 batteries (devices) per package: no battery handling label required.  • More than 2 batteries (devices) per package: battery handling label required.
Documentation	Only if more than 2 batteries per package, in the "Nature and Quantity of Goods" box: "Lithium ion batteries in compliance with section II of PI 967"
Miscellaneous	Adequate instruction commensurate with responsibilities.

Use as a tracking device or gateway in air freight PAO/CAX

The use of an active Connect S2 Gateway in an aircraft is generally not permitted.

If you need a Connect S Gateway for use in aircraft, please contact sales.tnt@de.bosch.com for specific Connect S2 gateways approved for air transport tracking.

12 Disposal

Disposing this product correctly will help save valuable resources and prevent any potential negative effects on human health and the environment, which could otherwise arise from inappropriate waste handling.

Take into account the respective national regulations, since improper disposal may otherwise be subject to penalties.

If the client detects damage or a defect in the hardware, he must check the security of the hardware concerned, take it out of operation if necessary, and return it to Bosch if Bosch is the owner of the hardware or if the hardware is still under warranty. In any case, as well as if Bosch is not the owner of the device or if the device is no longer under warranty, it must be ensured that the device, the accessories and the packaging are to be disposed of separately in an environmentally friendly manner; all electrical and electronic devices that can no longer be used must be returned to Bosch by the client or Bosch must be contacted at support.tnt@de.bosch.com to arrange for collection by Bosch.

For the return of equipment within the EU, follow the instructions below.

Disposal according to the WEEE Directive 2012/19/EU



WEEE-Reg.-No. DE 80087893

The unit, accessories, and packaging should be sorted for environmental-friendly recycling. Do not dispose of the device into the household waste! According to the European Guideline 2012/19/EU, electric and electronic devices that are no longer usable must be collected separately and disposed of in an environmentally correct manner.

Bosch Connected Industry will collect, reuse, or recycle all used Bosch Connected Industry devices. To have your device collected, please contact us at: support.tnt@de.bosch.com



13 Certifications and regulatory Notes

EU-Declaration of Conformity



Hereby, Robert Bosch Manufacturing Solutions GmbH – Bosch Connected Industry declares that the radio equipment type Connect S2 is in compliance with Directive 2014/53/EU and the Solar Frame is in compliance with Directive 2001/95/EU.

The full text of the EU declaration of conformity is available at the following internet address:

<http://eu-doc.bosch.com>

Model search: *ConnectS2*

Model search: *SolarFrame01*

Operating the device in countries out of the EU

The Connect Gateway carries the CE mark and is certified for operation in the European Union. For countries outside the European Union validate that local legal regulation allows the operation of the Connect Gateway.

Export Restrictions

Due to legal regulations the device must not be exported into the following countries or regions: Cuba, Crimea, Iran, North Korea, Syria, Turkey and Ukraine.

Federal Communications Commission (FCC) Notice

FCC has issued an EQUIPMENT AUTHORIZATION to Robert Bosch Manufacturing Solutions GmbH – Bosch Connected Industry for Connect S and Connect L according to FCC rule parts 15 with the FCC ID: 2AOSY-CONNECT02

The manufacturer is not responsible for any changes or modifications not expressly approved by the party responsible for compliance. Such modifications may void the FCC authorization to operate this equipment.

Note:

1. This device complies with Part 15 of the FCC rules. Operation is subject to the following conditions:
 - a) This device may not cause harmful interference.
 - b) This device must accept any interference received, including interference that may cause undesired operation.
2. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC Radiation exposure statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator and your body as well as kept minimum 20 cm from radio antenna depending on the portable or Mobile status of this module usage.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

14 Intended Use

The housing of the Connect Gateway must not be opened or manipulated. The Connect Gateway is designed for use in environmental conditions as described in the Technical Data section. Any intention to use the device under deviating environmental conditions is subject to re-testing and must be tested by the customer.

Neither the Connect Gateway nor any potential product derivatives have been planned, developed, or approved for use as system components for body surgical implants, other life-support applications, or other applications where a defect in the Bosch product could cause personal injury or death. The same applies to any type of weapon or device or application that could potentially endanger people.

The Connect Gateway is designed for monitoring and tracking and, according to the Machinery Directive 2006/42/EC, should not be used for the control and safety of machinery.

Bosch Connected Industry is not liable for any damage caused by using the Connect Gateway outside of the tested operating modes and/or the specified application area.

Radio frequency radiation exposure information: this equipment complies with the radiation exposure limits prescribed for an uncontrolled environment in fixed and mobile application conditions. This equipment was not designed as a portable radio device. The device should be mounted and operated at a minimum distance of 20 cm between the radiator and the user's body or persons in the vicinity.

15 Safety notes

Safety instructions for the integrated battery

CAUTION



The device contains a lithium battery. Improper handling of the battery may cause a fire.

- ▶ Do not damage or cut the device.
- ▶ Observe the notes on handling and transport in chapter 11.
- ▶ Observe the notes on disassembly and return in chapter 12.
- ▶ Only use the device in the specified temperature range, see chapter 10.

Safety instructions for installation

WARNING



Only use the device if it can be ruled out that persons or property will be harmed by the way it is attached.



The permanent fixation for the respective application must be ensured. Only use the device if the method of attachment rules out the possibility of personal injury or damage to property.

- ▶ Installation ONLY by qualified personnel.

CAUTION



The supplied mounting material (nuts, washers, etc.) is used for the correct installation of the solar frame and gateway.

- ▶ Only use the supplied mounting material.



The mounting surface must be even and must not be heavily soiled so that the Solar Frame rests evenly.

- ▶ Ensure a flat and clean surface.

Safety instructions for mounting with magnets

CAUTION



For safety reasons, attachment with magnets is only permitted up to a maximum height of 2 meters.

- ▶ Observe the maximum height of 2 m.
- ▶ Select an alternative mounting method for higher mounting positions.

WARNING



When mounting on vehicles, mobile machines or other moving objects, high accelerations can affect the device. In these cases, mounting the device with the mounting magnets is not permitted.

- ▶ DO NOT attach the gateway to the outside of moving objects such as trucks, trailers, cars or other vehicles using the magnets.

Safety instructions for handling the mounting magnets

WARNING



Contusions

Large magnets have a very high attraction force.

Unsafe handling could cause fingers or skin to be trapped between the magnets. This could lead to contusions or bruises.

- ▶ Wear protective gloves when handling the mounting magnets.
- ▶ Only remove one magnet at a time from the packaging for assembly.



Pacemaker

Magnets can influence the function of pacemakers and implanted defibrillators.

- ▶ As the carrier of such devices, maintain a sufficient distance from the mounting magnets.
- ▶ Warn carriers of such devices against approaching the magnets.



Heavy objects

Too heavy weights, symptoms of fatigue and material damage could cause magnets or magnetic hooks to come off the surface.

Falling objects can cause serious injury.

- ▶ The specified holding force is only valid for ideal conditions. Plan for a high safety buffer.
- ▶ Do not use magnets in places where people could be injured due to material failure.



Metal splinters

Neodymium magnets are fragile. If magnets collide, they could shatter.

Sharp fragments could hurl several meters and injure your eyes.

- ▶ Avoid the collision of magnets.
- ▶ Wear safety glasses when handling larger magnets.
- ▶ Make sure that persons in the vicinity are also protected or keep sufficient distance.

CAUTION



Postage

Magnetic fields of improperly packaged magnets could cause disturbances in sorting machines and damage fragile goods in other packages.

- ▶ Use a large box and place the magnet in the middle surrounded by lots of padding material.
- ▶ Arrange magnets in a package in a way that the magnetic fields neutralize each other.
- ▶ If necessary, use sheet iron to shield the magnetic field.
- ▶ There are stricter rules for airfreight: Refer to the warning notice "Airfreight".



Flammability

If you machine magnets, the drilling dust could easily ignite.

- ▶ Do not machine magnets or use suitable tools and sufficient cooling water.



Magnetic field

Magnets generate a far-reaching, strong magnetic field. They could damage televisions and laptops, computer hard drives, credit and debit cards, data storage media, mechanical watches, hearing aids and speakers.

- ▶ Keep magnets away from equipment and objects that could be damaged by strong magnetic fields.
- ▶ Refer to our table with recommended distances.



Airfreight

Magnetic fields of improperly packaged magnets could influence airplane navigation devices.

In the worst case it could lead to an accident.

- ▶ Airfreight magnets only in packaging with sufficient magnetic shielding.
- ▶ Please refer to the respective regulations.

**Nickel allergy**

Many of our magnets contain nickel, even those without nickel coating. Some people have allergic reactions when they come into contact with nickel. Nickel allergies can arise from constant contact with nickel-coated objects.

- ▶ Avoid permanent skin contact with magnets.
- ▶ Do not handle magnets if you already have a nickel allergy.

INFO**Effect on people**

According to current knowledge, magnetic fields of permanent magnets have no measurable positive or negative effect on humans. A health hazard from the magnetic field of a permanent magnet is unlikely, but cannot be completely excluded.

- ▶ For your safety, avoid permanent contact with the magnets.

**Chipping of the coating**

Most neodymium magnets have a thin nickel-copper-nickel coating to protect against corrosion. This coating can flake off or crack due to collisions or high pressure. This makes the magnets more sensitive to environmental influences such as moisture and can oxidize.

- ▶ Separate large magnets with a piece of cardboard.
- ▶ Generally avoid collisions between magnets and repeated mechanical loads (e.g. impacts).

**Oxidation, corrosion, rust**

Untreated neodymium magnets oxidize very quickly and decay in the process. Most magnets have a thin nickel-copper-nickel coating to protect against corrosion. This coating offers a certain protection against corrosion, but is not resistant enough for permanent outdoor use.

- ▶ Only use the magnets in dry indoor areas or protect the magnets from environmental influences.
- ▶ Avoid damaging the coating.

**Temperature resistance**

Most neodymium magnets permanently lose part of their holding power at temperatures above 80 °C.

- ▶ Do not use the magnets in places where they are exposed to high heat.

**Mechanical work**

Neodymium magnets are brittle, sensitive to heat and oxidize easily. Drilling or sawing a magnet with an unsuitable tool can break the magnet. The resulting heat can demagnetize the magnet. Because of the damaged coating, the magnet will oxidize and disintegrate.

- ▶ Refrain from mechanical processing of magnets.

Safety instructions for mounting with Solar Frame**CAUTION**

The supplied mounting material (nuts, washers, etc.) is used to correctly mount the Solar Frame and gateway.

- ▶ Only use the supplied mounting material.



The supplied flange nuts have been specially selected for mounting the solar frame and must be used ONLY ONCE. If the Solar Frame must be dismantled, always use new flange nuts.

- ▶ Only use the flange nuts supplied.
- ▶ Use them only once. No multiple use.

16 Third-Party Licenses and Components

The Connect S gateway contains in binary form software components provided by third parties. These software components are licensed under its own license terms.

Component: ARM CMSIS and system files

Copyright (C) 2009-2015 ARM Limited.

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
- Neither the name of ARM nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL COPYRIGHT HOLDERS AND CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Component: STMicroelectronics STM32 HAL Drivers

COPYRIGHT(c) 2015-2017 STMicroelectronics

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. Neither the name of STMicroelectronics nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT HOLDER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Component: Segger RTT

(c) 2014 - 2015 SEGGER Microcontroller GmbH & Co. KG - www.segger.com

All rights reserved.

This software may in its unmodified form be freely redistributed in source form. The source code may be modified, provided the source code retains the above copyright notice, this list of conditions and the following disclaimer. Modified versions of this software in source or linkable form may not be distributed without prior consent of SEGGER. This software may only be used for communication with SEGGER J-Link debug probes.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL SEGGER Microcontroller BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Component: RFC2822

Copyright (C) The Internet Society (2001). All Rights Reserved.

This document and translations of it may be copied and furnished to others, and derivative works that comment on or otherwise explain it or assist in its implementation may be prepared, copied, published and distributed, in whole or in part, without restriction of any kind, provided that the above copyright notice and this paragraph are included on all such copies and derivative works. However, this document itself may not be modified in any way, such as by removing the copyright notice or references to the Internet Society or other Internet organizations, except as needed for the purpose of developing Internet standards in which case the procedures for copyrights defined in the Internet Standards process must be followed, or as required to translate it into languages other than English.

The limited permissions granted above are perpetual and will not be revoked by the Internet Society or its successors or assigns.

This document and the information contained herein is provided on an "AS IS" basis and THE INTERNET SOCIETY AND THE INTERNET ENGINEERING TASK FORCE DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTY THAT THE USE OF THE INFORMATION HEREIN WILL NOT INFRINGE ANY RIGHTS OR ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

We are very interested in your feedback so that our products and this documentation can be continuously improved. Please submit your questions, comments and suggestions for improvement via our [contact](#) website

Robert Bosch Manufacturing Solutions GmbH

BCI - Bosch Connected Industry

BCI/PAL

Wernerstr. 51

70469 Stuttgart

Germany

Support.TnT@de.bosch.com