# XGCS491B201

## Standalone RFID reader

Note: you can download this Instruction Sheet in different languages from our website at:
**www.tesensors.com**

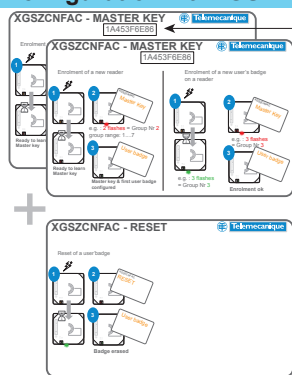| en | it |
| fr | pt |
| de | zh |
| es | |

http://qr.tesensors.com/XG0004

**Flash this Qr-code to access this Intruction Sheet in other languages.**

We welcome your comments about this document. You can reach us by e-mail at:
**customer-support@tesensors.com**

## Configuration kit: XGSZCNFAC

**C - MASTER KEY**
1A453F6E86

Badge MASTER KEY Code:

- The badges «MASTER KEY» contain a coded key that serves as a reference for configuring a group of readers and associated user badges
- The second copy is used in case of loss or damage of the first one.
- The badge «RESET» allows to erase an already configured user badge.
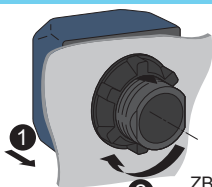
*Note: We recommend users to note the code written on the badges, only way to get a copy in case of loss of the two «MASTER KEY» badges of origin.*
*You can contact us by e-mail at: customer-support@tesensors.com*

## Dimensions

mm
*in.*

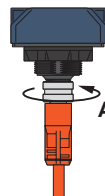Ø 22 / *0.87*
M12

13,5 / *0.53*
15 / *0.59*
39,5 / *1.56*

40 / *1.57*
40 / *1.57*
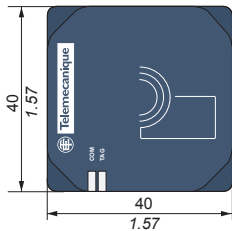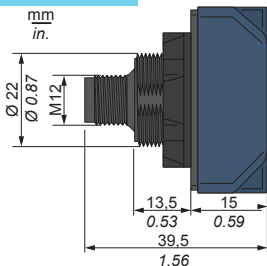
## Tightening torques

ZB5AZ905
2,2 Nm±0,2 / *19.5 lb-in±1.8*

**A** ≤ 2 Nm / *17.7 lb-in*

## Utilization precautions

Mounting on a metal structure

e >20 mm
*e >0.787in.*
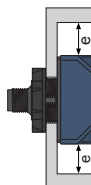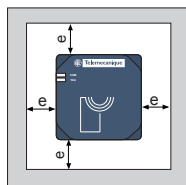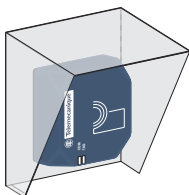
Minimum distances between two Readers

e1 = e2 ≥ 310 mm / *12.2 in.*

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## Characteristics

| | | |
|---|---|---|
| Standards / Certifications | | CE, cULus, IC, FCC Part 15 |
| Ambient air temperature | Operation | -40…+70°C (-40…158°F) |
| | Storage | -40…+85 °C (-40…+185°F) |
| Degree of protection | | IP65 in accordance with IEC 60529 |
| Resistance to mechanical shocks | | IK04 according to EN 50102 |
| RFID frequency | | 13.56 MHz |
| RFID Protocol | | ISO 15693 - ISO 14443A |
| Nominal power supply | | 24 Vdc PELV |
| Power supply voltage limits | | 19.2…29 V ripple included |
| Power consumption (without load) | | < 60 mA |
| Output | Type | PNP |
| | Maximum current | 300 mA |
| | Load type | Relay / Electric strike / PLC or Controller Input |
| Protections | Power supply | Reverse polarity protection |
| | Output | Overload and short-circuit protection |
| Diagnostic | | 2 two-tone LEDs |
| Connection | | M12 male socket, 5 pins |
| Mounting method | | Fixing with nut in a hole (diam 22,5 mm |

## WARNING TO USERS IN THE UNITED STATES AND CANADA

**WARNING TO USERS IN THE UNITED STATES**

Federal Communication Commission Interference Statement

47 CFR Section 15.105(b)

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. 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 device 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 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.

This device Equipment name complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
**1.** This device may not cause harmful interference.
**2.** This device must accept any interference received, including interference that may cause undesired operation.

**NO UNAUTHORIZED MODIFICATIONS**

47 CFR Section 15.21

**CAUTION:** This equipment may not be modified, altered, or changed in any way without signed written permission from SCHNEIDER ELECTRIC. Unauthorized modification may void the equipment authorization from the FCC and will void the SCHNEIDER ELECTRIC warranty.

**WARNING TO USERS IN THE CANADA / ATTENTION POUR LES UTILISATEURS AU CANADA**

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:
**1.** this device may not cause interference, and
**2.** this device must accept any interference received, including interference that may cause undesired operation of the device.

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

*Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :*
***1.*** *il ne doit pas produire de brouillage, et*
***2.*** *l'utilisateur du dispositif doit être prêt a accepter tout brouillage radioélectrique reçu, même si ce brouillage est susceptible de compromettre le fonctionnement du dispositif.*

*Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada.*
*Dans le but de réduire les risques de brouillage radioélectrique à l' intention d'autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.*

| | XGCS491B201 |
|---|---|
| FCC ID | TW6XGCS4 |
| IC info | 7002B-XGCS4 |

## Wiring diagrams
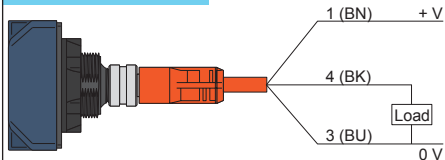


| Socket Sensor | | |
|---|---|---|
| Pin. n° | | Description |
| | 1 | +24 Vdc |
| | 2 | Reserved - Do not connect |
| | 3 | 0 V |
| | 4 | PNP Output |
| | 5 | Reserved - Do not connect |

## ⚠ CAUTION

**UNINTENDED EQUIPMENT OPERATION**

- Do not use a 4 or 5 wires cable. That can decrease EMC immunity.
- Do not power up the actuators of the machine or system connected to the standalone RFID reader while the enrolment of user's badges.

**Failure to follow these instructions can result injury or equipment damage.**

## Output Operation
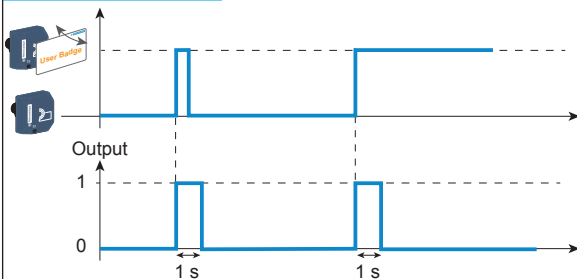


## Signaling (LEDs states)
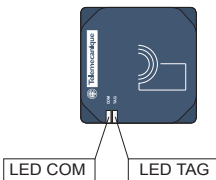


LED COM          LED TAG

| States | LED COM | LED TAG |
|---|---|---|
| Initialisation after powered up | Orange | |
| Reader not configured | Red | |
| Configuration mode running | Red | Flashing Red (number of flashes = Reader group number) |
| Configured reader in operation | | Flashing Green (number of flashes = Reader group number) |
| Reading Error of the badge | | Red |
| PNP Output: ON (accepted badge) | Green | Green |
| Badge: rejected | Red | Green |
| Badge not configured | Orange | Green |
| Master Key Badge: rejected | Orange | Green |
| Overload or short-circuit on the output: detected | Red | Red |

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## Basic Principles

### Enrollment

New readers and badges are all identical. The commissioning of a system therefore requires a configuration step (enrollment) readers that will be installed and then users badges.

### Master Key

A unique reference key is stored in the badge «MASTER KEY». This badge is used to modify the configuration of readers and to associate badges "USER" to the reader, from a master key. This key is stored permanently and allows readers to recognize the configured badges.

### RFID reader

The readers, configured from the same badge «MASTER KEY» make up a homogeneous group (same master key). A reader, configured from a badge «MASTER KEY», can not be reconfigured from another badge «MASTER KEY» (except, if this is the double of the original badge)

### Access Levels

It is possible to manage access levels within a set of readers, assigning a group number (1 to 7) to each one of these readers. Then, each user card can be enrolled in one or more groups.
*Note: There is no limit in the number of readers by group number. The group number, configured in a reader can be modified using the badge «MASTER KEY».*

### User badge

Blank user badges can be enrolled from any readers, provided that it was previously configured with a badge «MASTER KEY». The user badges are then accepted by all readers with the same master key and the same group number. A user badge can be configured to be accepted by several groups. For this it is necessary to restart the enrollment process of this badge with one of the readers in each group.

*Note: The enrollment of a badge in a defined group cannot be canceled. It is necessary to erase the badge (reset) and restart the complete enrollment process.*

### RFID reader Output

The RFID reader output is ON when a user card is accepted and will be OFF after a fixed delay of one second, even if the card is always present.

### Reset User Badge

If necessary, it is possible to reset a user badge using the badge «RESET», included in the configuration kit XGSZCNFAC. The deleted badges can be reused (they are equivalent to blank user badges).

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### Maintenance

### Reset User badge

If necessary, it is possible to reset a user badge using the badge «RESET», included in the configuration kit XGSZCNFAC. The deleted badges can be reused (they are equivalent to blank user badges).

### To add a User badge

To create a new user badge from a new or an erased badge can be performed from any reader of the installation.

*Note: The number of user badges is not limited.*

### To add or replace a reader

The procedure is the same as that used for the installation commissioning (including access levels if this function is used).

*Note: The number of readers is not limited.*

### Reference key: Backup

It is recommended to store one of the badges «MASTER KEY» in a safe place, in order to be able to do the maintenance in case of loss or failure of the badge used for the installation commissioning.
The code on the badge can also help you to regenerate a copy on request, in case of loss or failure (contact your Custormer Care Center)

### Output Reader Protection

The reader XGCS491B201 is protected against overloads and short-circuits. In case of anomaly, the output is locked at 0 (OFF) until the badge is removed. Then, the reader will automatically switch to normal mode.

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# XGCS491B201

## New Reader Enrollment

**Legend**

LED COM:
GN$_{COM}$
OR$_{COM}$
RD$_{COM}$

LED TAG:
GN$_{TAG}$
OR$_{TAG}$
RD$_{TAG}$

⊗ OFF
● ON
☀ Flashing

GN: Green
OR: Orange
RD: Red

**1** Power up the reader
OR$_{COM}$ → RD$_{COM}$

**2** XGSZCNFAC Master Key — RD$_{COM}$
RD$_{TAG}$ → 1 flash = group 1
2 flashes = group 2
.
.
.
7 flashes = group 7

**3** XGSZCNFAC Master Key
Remove the badge «Master Key» when the number of red flashes corresponds to the group number of the reader.
RD$_{COM}$    RD$_{TAG}$

A serie of green flashes allows to check the group number of the reader.
RD$_{COM}$    GN$_{TAG}$

The number of green flashes = The desired group number

Not OK
OK

**4** USER BADGE
The key and the group number are memorized by the reader. The user badge is automatically associated to this reader (it is possible to present successively several blank user badges to associate them to the same reader).
GN$_{COM}$    GN$_{TAG}$

OUTPUT
1 + V
4
3  0 V
ON

**5** Switch off the reader power supply to leave the enrollment mode

**NOTICE**

**UNINTENDED EQUIPMENT OPERATION**
● The user badge must be blank or must be a badge already enrolled with the same «Master Key».
● An already enrolled reader cannot be enroll with another badge «Master Key».

**Failure to follow these instructions can result in equipment damage.**

## New blank user badge Enrollment

**1** Power up the reader and check the group number of the reader.
OR$_{COM}$    GN$_{TAG}$
GN$_{TAG}$ → 1 flash = group 1
2 flashes = group 2
.
.
.
7 flashes = group 7

Example Group 2:
☀☀__☀☀__☀☀........

**2** XGSZCNFAC Master Key — RD$_{COM}$
RD$_{TAG}$ → 1 flash = group 1
2 flashes = group 2
.
.
.
7 flashes = group 7

**3** XGSZCNFAC Master Key
Remove the badge «Master Key» when the number of red flashes corresponds to the group number of the reader.
RD$_{COM}$    RD$_{TAG}$

A serie of green flashes allows to check the group number of the reader.
RD$_{COM}$    GN$_{TAG}$

The number of green flashes = The desired group number

Not OK
OK

**4** Blank USER BADGE
The key and the group number are memorized by the reader. it is possible to present successively several blank user badges to enroll them.
GN$_{COM}$    GN$_{TAG}$

OUTPUT
1 + V
4
3  0 V
ON

**5** Switch off the reader power supply to leave the enrollment mode.

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# XGCS491B201

## A badge enrollment on several group numbers

**1** Power up the reader and check the group number of the reader.

OR$_{COM}$ → GN$_{TAG}$

GN$_{TAG}$ → 1 flash = group 1
2 flashes = group 2
.
.
.
7 flashes = group 7

Example Group 2:

**2** XGSZCNFAC Master Key

RD$_{COM}$

RD$_{TAG}$ → 1 flash = group 1
2 flashes = group 2
.
.
.
7 flashes = group 7

**3** XGSZCNFAC Master Key

Remove the badge «Master Key» when the number of red flashes corresponds to the group number of the reader.

RD$_{COM}$   RD$_{TAG}$

A serie of green flashes allows to check the group number of the reader.

RD$_{COM}$   GN$_{TAG}$

The number of green flashes = The desired group number / Not OK

OK
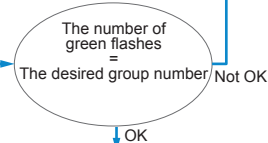
**4** USER BADGE

The group number is memorized on the same user badge in addition of one or several numbers already memorized.

GN$_{TAG}$

**5** Switch off the reader power supply to leave the enrollment mode.

## User Badge Reset

**1** Power up the reader and check the group number of the reader.
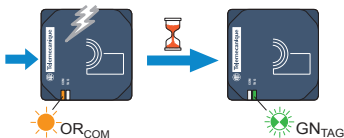
OR$_{COM}$ → GN$_{TAG}$

GN$_{TAG}$ → 1 flash = group 1
2 flashes = group 2
.
.
.
7 flashes = group 7

Example Group 2:

**2** XGSZCNFAC RESET

RD$_{COM}$

RD$_{TAG}$ → 1 flash = group 1
2 flashes = group 2
.
.
.
7 flashes = group 7

**3** XGSZCNFAC RESET

Remove the badge «Reset» when the number of red flashes corresponds to the group number of the reader.

RD$_{COM}$   RD$_{TAG}$

A serie of green flashes allows to check the group number of the reader.

RD$_{COM}$   GN$_{TAG}$

The number of green flashes = The desired group number / Not OK

OK
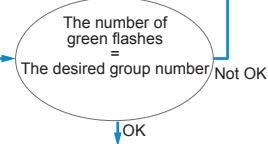
**4** USER BADGE

All data in the user badge memory are erased (group numbers and «Master Key»).
Several badges can be successively erased if necessary.

OR$_{COM}$   GN$_{TAG}$

**5** Switch off the reader power supply to leave the enrollment mode.

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## Configuration examples

**3 identification points for 10 users with the same profile.**

3 readers XGCS491B201 (never configured)
1 configuration kit XGSZCNFAC
10 blank badges XGHB90E340

**1** Power up the reader and check the group number of the reader.

Reader 1 — OR$_{COM}$
Reader 1 — RD$_{COM}$

**2** XGSZCNFAC Master Key
Reader 1
RD$_{COM}$   RD$_{TAG}$

RD$_{TAG}$ → 1 flash = group 1
2 flashes = group 2
.
.
.
7 flashes = group 7

**3** XGSZCNFAC Master Key
Reader 1
GN$_{TAG}$

The number of green flashes = The desired group number — Not OK

OK

**4** USER BADGE 1   USER BADGE 2   USER BADGE 3   USER BADGE 10
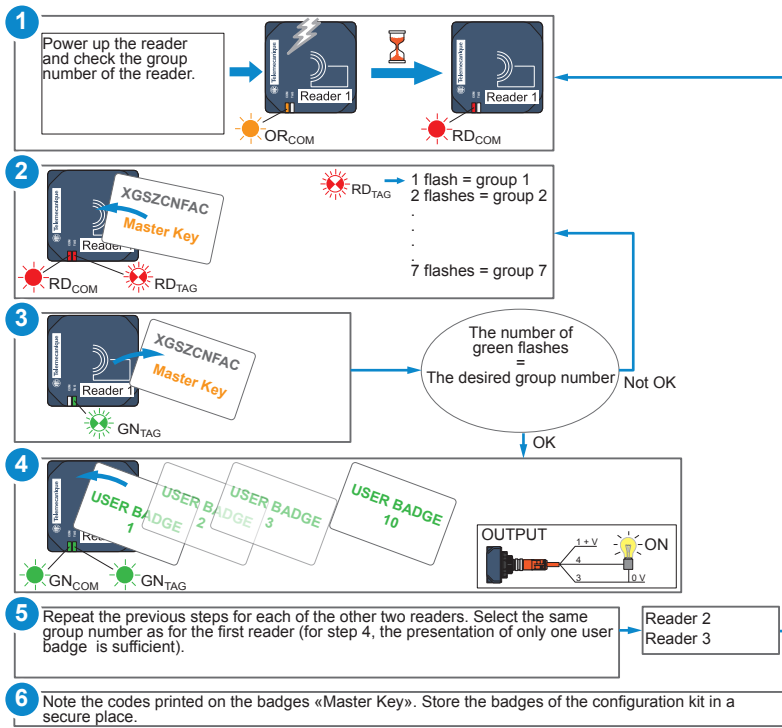Reader 1
GN$_{COM}$   GN$_{TAG}$

OUTPUT
1 + V
4
3   0 V
ON

**5** Repeat the previous steps for each of the other two readers. Select the same group number as for the first reader (for step 4, the presentation of only one user badge is sufficient).

Reader 2
Reader 3

**6** Note the codes printed on the badges «Master Key». Store the badges of the configuration kit in a secure place.

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**2 identification points (A & B). 1 user for each point + an authorised badge on the 2 identification points (Pass).**

2 readers XGCS491B201 (never configured)
1 configuration kit XGSZCNFAC
3 blank badges XGHB90E340

**Note:**
Reader A and user badge A will be setup for group 1

Reader B and user badge B will be setup for group 2

**1** Power up the reader and check the group number of the reader.

Reader A — OR$_{COM}$
Reader A — RD$_{COM}$

**2** XGSZCNFAC Master Key
Reader A
RD$_{COM}$   RD$_{TAG}$

RD$_{TAG}$ → 1 flash = group 1
2 flashes = group 2
.
.
.
7 flashes = group 7

**3** XGSZCNFAC Master Key
Reader A
GN$_{TAG}$

The number of green flashes = The desired group number — Not OK

OK

**4** USER BADGE A   &   USER BADGE Pass
Reader A
GN$_{TAG}$

**5** Repeat the previous steps for the second reader B, with the group number = 2 and the user badges B and Pass for the step 4.

**6** Note the codes printed on the badges «Master Key». Store the badges of the configuration kit in a safe place.

## Frequently Asked Questions

| Questions | Answers |
|---|---|
| A user copied the datas from his badge on another badge with a RFID reader connected to a PC or a NFC smartphone. | This badge will be rejected by the readers (ref: XGCS491B201) because they automatically check if the presented badge has been enrolled with the badge «Master Key» or if it is a copied badge. |
| The 2 badges «Master Key» that were used for the configuration of an application have been lost. | Contact your commercial agency or your «Customer Care Center» to get a copy, providing the code written on the original badges «Master Key». |
| How to change the reference key saved on a reader? | The reader enrollment from a badge «Master Key» cannot be deleted or modified. |
| A user badge has been lost or stolen. How to cancel the use of this badge? | Change the configuration of readers so that the group number configured in the stolen badge is no longer used. It will be necessary to re-configure the user badges still in service. |
| The output is at 0 Vdc after one second, even if the badge is present. | This operation prevents an operator to defraud a reader by fixing his badge on this one, allowing a permanent access. |
| How to cancel the authorization of a user badge relative to a group number? | Erase the badge with the badge «Reset» and then, restart the enrollment process for the authorized groups for this badge. |

## Diagnosis

| Anomalies | LED «COM» | LED «TAG» | Diagnosis |
|---|---|---|---|
| The output is not activated when a user badge is presented in front of the reader. | Red | Red | The load is not adapted to the output (I > 300 mA) or a short-circuit has been detected by the reader: Check the wiring and the load type. |
| | Orange | Green | That is a blank badge : Execute the enrollment process to be able to use this badge on this reader. |
| | | Green | This badge is not registered for the group number to which the reader belongs: Check if the group number of the reader is correct (counting the number of flashes on the «LED TAG» in the absence of badge) and change the group number of the reader if necessary (with the badge «Master Key»). Otherwise, run the enrollment process in order to use this badge on this reader. Or this badge has been enrolled from another key: Execute the «Reset» procedure and the enrollment procedure, to be able to use this badge on that drive. |
| The LED "COM" is permanently lit in red, in absence of the badge | Red | | The reader is not configured: Execute the enrollment process with a badge «Master Key». |
| The enrollment process of the reader with the badge «Master Key» is not working. | Orange | Green | The badge «Master Key» must be the first detected badge by the reader after its powering up. The reader has already been enrolled with another badge «Master Key». |