tecom

TS1061 Dual Wiegand Interface Installation Manual

Content

Important information

Limitation of liability

To the maximum extent permitted by applicable law, in no event will Aritech be liable for any lost profits or business opportunities, loss of use, business interruption, loss of data, or any other indirect, special, incidental, or consequential damages under any theory of liability, whether based in contract, tort, negligence, product liability, or otherwise. Because some jurisdictions do not allow the exclusion or limitation of liability for consequential or incidental damages the preceding limitation may not apply to you. In any event the total liability of Aritech shall not exceed the purchase price of the product. The foregoing limitation will apply to the maximum extent permitted by applicable law, regardless of whether Aritech has been advised of the possibility of such damages and regardless of whether any remedy fails of its essential purpose.

Installation in accordance with this manual, applicable codes, and the instructions of the authority having jurisdiction is mandatory.

The customer is responsible for testing and determining the suitability of this product for specific applications. The customer is responsible for testing the product at least once every three months.

While every precaution has been taken during the preparation of this manual to ensure the accuracy of its contents, Aritech assumes no responsibility for errors or omissions.

Agency compliance

This product conforms to the standards set by Standards Australia on behalf of the Australian Communications and Media Authority (ACMA).

Ensure that enclosure covers are fitted to maintain ACMA compliance.

Notice! This is a Class B product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Contact information

For contact information, see www.aritech.com.au

Product overview

This manual applies to the TS1061 Dual Wiegand Interface. The Dual Wiegand Interface can be attached to a Challenger*Plus* panel or a TS1066 Network Access Controller to provide two Wiegand interfaces, as well as additional inputs and relays.

Note: The Dual Wiegand Interface is only compatible with Challenger*Plus* and not supported by Challenger10 or Challenger V8.

This manual describes:

- How to install the Dual Wiegand Interface
- How to connect the Dual Wiegand Interface to a Challenger*Plus* panel or a Network Access Controller
- How to connect other equipment to the Dual Wiegand Interface

This manual is intended for use only by trained Challenger installation and configuration technicians.

Mechanical and environmental specifications

Storage	Temperature	-20 to +80°C
	Location	Indoor. Dry area.
	Physical dimensions (W x D x H)	128 x 78 x 21 mm
	Weight	255g
Operating environment	Temperature	0 to 50°C (Refer to Appendix C: Operating temperature
	Relative humidity	0 to 93% non-condensing
	Pollution Class	2 or lower
	Altitude	≤ 2000m

Product contents

Inspect the package and contents for visible damage. If any components are damaged or missing, do not use the unit; contact the supplier immediately. If you need to return the unit, you must ship it in the original box.

Table 1 below lists the items that are shipped with a TS1061 Dual Wiegand Interface.

Table 1: TS1061 shipping list

Quantity	Item	Quantity	Item
1	TS1061 board	7	2-way plug-on screw terminal connectors
1	TS1061 Dual Wiegand Interface Installation Manual	1	4-way RS-485 cable
5	M3 x 10 pan head screws	1	2-way lock power cable
4	Standoff board mounts	8	10K 1/4 watt resistors
8	3-way plug-on screw terminal connectors	1	Earth lead

Related documentation

The *ChallengerPlus Installation and Quick Programming Manual* and *ChallengerPlus Programming Manual* provide detailed information about configuring and programming a Challenger*Plus* system.

The *ENC-LGE Large Enclosure Installation Manual* provides instructions for installing the ENC-LGE Large Enclosure.

The *TS1066 Network Access Controller Installation Manual* describes how to install the TS1066 Network Access Controller. The *TS1066 Network Access Controller Programming Manual* provides detailed information about configuring and programming the Network Access Controller, including devices attached to its buses, such as the TS1061 Dual Wiegand Interface.

The Challenger*Plus* system is modular. Refer also to the documentation that is shipped with each module that you intend to use.

Before you begin

When installing a TS1061 Dual Wiegand Interface, or any other parts of the system, you need to be aware of requirements for cabling and earthing, and plan accordingly. Refer to "Appendix D: Cabling requirements" on page 23.

Notice! A qualified service person, complying with all applicable codes, should perform all required hardware installation.

Disclaimer: This manual contains recommendations based on Australia and New Zealand codes. It is not an authoritative reference regarding codes and has not been reviewed by the responsible authorities. The codes may change and may not be reflected in this document

Safety Warnings

Warning: Field wiring errors or damage may present hazardous voltages inside the enclosure. Treat all wires and boards in the enclosure as hazardous until checked and validated as safe.

Warning: Aritech recommends the use of personal protection equipment, such as gloves, glasses, voltage detectors and meters for all installation and maintenance operations.

Warning: The fuses on the TS1061 Dual Wiegand Interface may be very hot if they are in the tripped state or close to tripping. Do not touch.

Installing the Dual Wiegand Interface

Installation guidelines

TS1061 Dual Wiegand Interfaces are designed, assembled and tested to comply with the requirements related to safety, emission and immunity with respect to environmental electrical and electromagnetic interference, as of current applicable codes, when installed according to the requirements in this manual.

In addition to the general installation guidelines, installers must adhere to any country dependent requirements of local applicable standards.

The TS1061 Dual Wiegand Interface is designed to be used with the Challenger*Plus* and Network Access Controller, and must be installed as described in the Installation Manual of the panel it is connected to.

- Circuit separation, conduit materials, and workmanship are to comply with all applicable codes and regulations.
- Only use units in a clean dry indoor environment, as described on page 1.
- Installation must be performed in accordance with AS/NZS 2201.

Installation procedures

The TS1061 Dual Wiegand Interface must be installed in the ENC-LGE Large Enclosure.

Mounting in the enclosure

The installation procedure is as follows:

1. Install four standoff board mounts for the TS1061 board on the enclosure. Refer to the *ENC-LGE Large Enclosure Installation Manual* for mounting locations. Figure 9 on page 18 indicates some possible mounting locations in the enclosure.

2. Remove the TS1061 board from its antistatic bag.

3. Use four M3 x 10 pan head screws to fix the board to the enclosure's standoffs.

4. Slide the board's terminal connectors together and mount them to the board.

5. Configure the Interface's address using the Address DIP switch. Refer to "DIP switch settings" on page 5.

DIP switch settings

The TS1061 Dual Wiegand Interface can be connected to a Challenger*Plus* panel's COMMS 1 or COMMS 2, or a Network Access Controller's BUS 1 or BUS 2. The Interface is polled as a DGP. The addressing ranges that can be used depend on whether the Interface is connected to a Challenger*Plus* or a Network Access Controller, as shown in Table 2 below.

Table 2: Interface addressing ranges

	LAN/Bus	Address	Polled as
Challenger*Plus*	COMMS 1	1 to 12	DGP 1 to 12
	COMMS 2	1 to 12	DGP 17 to 28
Network Access Controller	BUS 1	1 to 15	DGP 1 to 15
	BUS 2	1 to 16	DGP 17 to 32

Use the four-segment Address DIP switch to set the address.

Figure 1: Address DIP switch

Settings for connection to Challenger*Plus* panel:

The DIP switch settings for connection to a Challenger*Plus* panel are shown in Table 3 below.

Table 3: DIP switch settings for connection to Challenger*Plus*

Challenger*Plus* LAN	Address	Polled as	Door numbers	S1-1	S1-2	S1-3	S1-4
COMMS 1	1	DGP 1	17, 18	I	O	O	O
COMMS 1	2	DGP 2	21, 22	O	I	O	O
COMMS 1	3	DGP 3	25, 26	I	I	O	O
COMMS 1	4	DGP 4	29, 30	O	O	I	O
COMMS 1	5	DGP 5	33, 34	I	O	I	O
COMMS 1	6	DGP 6	37, 38	O	I	I	O
COMMS 1	7	DGP 7	41, 42	I	I	I	O
COMMS 1	8	DGP 8	45, 46	O	O	O	I
COMMS 1	9	DGP 9	49, 50	I	O	O	I
COMMS 1	10	DGP 10	53, 54	O	I	O	I
COMMS 1	11	DGP 11	57, 58	I	I	O	I
COMMS 1	12	DGP 12	61, 62	O	O	I	I
COMMS 2	1	DGP 17	81, 82	I	O	O	O

ChallengerPlus LAN	Address	Polled as	Door numbers	S1-1	S1-2	S1-3	S1-4
COMMS 2	2	DGP 18	85, 86	O	I	O	O
COMMS 2	3	DGP 19	89, 90	I	I	O	O
COMMS 2	4	DGP 20	93, 94	O	O	I	O
COMMS 2	5	DGP 21	97, 98	I	O	I	O
COMMS 2	6	DGP 22	101, 102	O	I	I	O
COMMS 2	7	DGP 23	105, 106	I	I	I	O
COMMS 2	8	DGP 24	109, 110	O	O	O	I
COMMS 2	9	DGP 25	113, 114	I	O	O	I
COMMS 2	10	DGP 26	117, 118	O	I	O	I
COMMS 2	11	DGP 27	121, 122	I	I	O	I
COMMS 2	12	DGP 28	125, 126	O	O	I	I
	Legend: I=ON, O=OFF						

Settings for connection to Network Access Controller:

The DIP switch settings for connection to a Network Access Controller are shown in Table 4 below.

Table 4: DIP switch settings for connection to Network Access Controller

Network Access Controller Bus	Address	Polled as	S1-1	S1-2	S1-3	S1-4
BUS 1	1	DGP 1	I	O	O	O
BUS 1	2	DGP 2	O	I	O	O
BUS 1	3	DGP 3	I	I	O	O
BUS 1	4	DGP 4	O	O	I	O
BUS 1	5	DGP 5	I	O	I	O
BUS 1	6	DGP 6	O	I	I	O
BUS 1	7	DGP 7	I	I	I	O
BUS 1	8	DGP 8	O	O	O	I
BUS 1	9	DGP 9	I	O	O	I
BUS 1	10	DGP 10	O	I	O	I
BUS 1	11	DGP 11	I	I	O	I
BUS 1	12	DGP 12	O	O	I	I
BUS 1	13	DGP 13	I	O	I	I
BUS 1	14	DGP 14	O	I	I	I
BUS 1	15	DGP 15	I	I	I	I
BUS 2	1	DGP 17	I	O	O	O

Network Access Controller Bus	Address	Polled as	S1-1	S1-2	S1-3	S1-4
BUS 2	2	DGP 18	O	I	O	O
BUS 2	3	DGP 19	I	I	O	O
BUS 2	4	DGP 20	O	O	I	O
BUS 2	5	DGP 21	I	O	I	O
BUS 2	6	DGP 22	O	I	I	O
BUS 2	7	DGP 23	I	I	I	O
BUS 2	8	DGP 24	O	O	O	I
BUS 2	9	DGP 25	I	O	O	I
BUS 2	10	DGP 26	O	I	O	I
BUS 2	11	DGP 27	I	I	O	I
BUS 2	12	DGP 28	O	O	I	I
BUS 2	13	DGP 29	I	O	I	I
BUS 2	14	DGP 30	O	I	I	I
BUS 2	15	DGP 31	I	I	I	I
BUS 2	16	DGP 32	O	O	O	O
Legend: I = ON, O = OFF						

Connections

See Figure 2 below for the locations of connectors and other items. See "Appendix D: Cabling requirements" on page 23 for recommendations for the application and wiring of Challenger equipment.
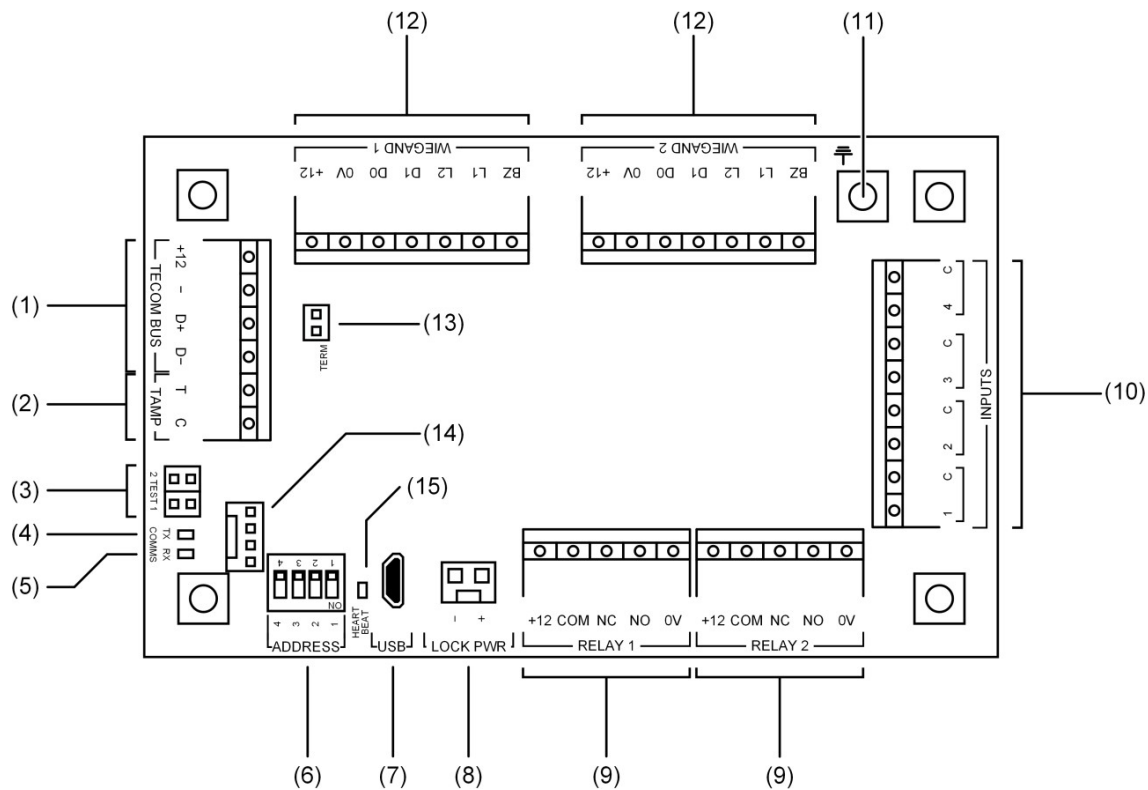
Figure 2: TS1061 board details

Figure 2 legend

Item	Description
1.	**Challenger*Plus* application:** Connect the TECOM BUS +12, TECOM BUS −, TECOM BUS D+ and TECOM BUS D− terminals to the Challenger*Plus* panel's COMMS 1 or COMMS 2 cable.
	Network Access Controller application: Connect the TECOM BUS +12, TECOM BUS −, TECOM BUS D+ and TECOM BUS D− terminals to the Network Access Controller's BUS 1 or BUS 2 cable. (Only use if (14) is not used).
2.	Connect the TAMP T and TAMP C terminals to the panel tamper switch in the enclosure. Short circuit for sealed, open circuit for unsealed. Must be sealed if not used. Can only be used with normally closed contacts such as the panel tamper switches. **Note:** Panel tamper switch must only be connected to one board in the enclosure.
3.	TEST 1 and TEST 2 links. Both links are used when updating firmware via CTPlus (refer to "Upgrading firmware" in the CTPlus online help for instructions).
4.	COMMS Tx LED to indicate activity on the RS-485 LAN/bus. See "LED indications" on page 19.
5.	COMMS Rx LED to indicate activity on the RS-485 LAN/bus. See "LED indications" on page 19.

Item	Description
6.	Address selection DIP switch. Configure the Interface's address using the ADDRESS DIP switch. Refer to " DIP switch settings" on page 5.
7.	Micro-B USB port (USB cable not supplied).
8.	LOCK PWR 2-pin plug-in socket for lock power cable from a Network Access Controller.
9.	Relay connections for two doors. Refer to " Door lock relay wiring" on page 12. A suppression diode (such as 1N4004) must be fitted across door locks.
10.	Input terminals. See "When powering locks from an external power supply or using the relays for other purposes, the relay contact rating must be observed. **Maximum switching capacity (resistive/load): 3A, 30VDC.** **Minimum switching capacity: 100mA, 5VDC** Inputs" on page 12.
11.	Earth terminal. Attach the ring terminal of the supplied earth lead. See " Earthing" on page 18.
12.	Two sets of Wiegand reader connections. See "Wiegand reader connections" on page 14.
13.	TERM link for the RS-485 LAN/bus. See "Terminating the RS-485 LAN" on page 11.
14.	4-pin plug-in socket for easy RS-485 cable connection to a Network Access Controller's BUS 1.
15.	Heart beat LED. See "LED indications" on page 19.

RS-485 LAN/Bus

The TS1061 Dual Wiegand Interface can be connected to a Challenger*Plus* panel or Network Access Controller via the 4-pin RS-485 terminals (Figure 2 on page 8 item 1).

Alternatively, the Interface can be connected to a Network Access Controller's BUS 1 via the 4-pin plug-in RS-485 socket (Figure 2 on page 8 item 14).

Using the plug-in RS-485 socket:

To easily connect the Interface to a Network Access Controller's BUS 1, connect a 4-way RS-485 cable (supplied) to the 4-pin plug-in RS-485 socket (Figure 2 on page 8 item 14).

Refer to Figure 3 on page 10 for example connections of the 4-way RS-485 cable from a Network Access Controller to the Interface (items B and D).

Figure 3: Example TS1066 to TS1061 cable connections for RS-485 and lock power
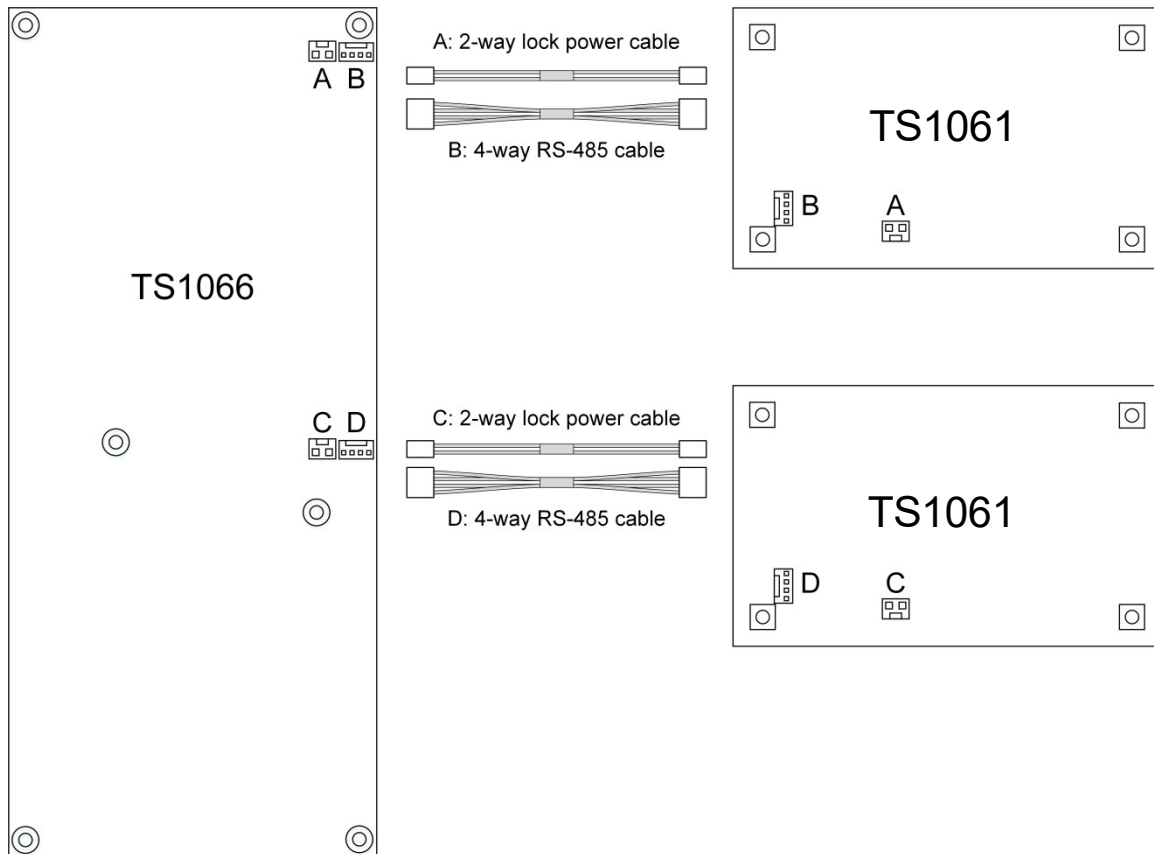
Note: Refer to the *TS1066 Network Access Controller Installation Manual* for information on the maximum total current draw allowed from a Network Access Controller.

Using the RS-485 terminals:

Use 2-pair twisted shielded data cable such as Belden 8723 to connect the Interface to a Challenger*Plus* panel or Network Access Controller.

- Connect the +12 terminal to the red wire. The +12 terminal provides +12 V to the Interface (Refer to section Power supply to RS-485 devices for more details).

- Connect the − terminal to the black wire.

- Connect the D+ terminal to the white wire. The D+ terminal is data positive.

- Connect the D− terminal to the green wire. The D− terminal is data negative.

- Connect the data cable shield to the LAN earth connection (Figure 2 on page 8, item 11) if the other end of the data cable shield is not earthed.

Terminating the RS-485 LAN

All Challenger LAN devices (including the panel) use a 470 Ω LAN termination resistor where required. LAN termination resistors are used to set the impedance of the LAN to around 220 Ω in order to minimise noise. The termination resistor may be external or on-board (devices with an on-board resistor use a link to set the LAN termination to ON).

A Challenger LAN should have only two devices with the LAN termination set to ON (or the LAN termination resistor fitted):

- In a straight LAN configuration, the TERM links are ON at the Challenger panel and the most distant device.

- In a star LAN configuration, the TERM links are ON at the two devices that are the furthest apart (and OFF at the Challenger panel).

In a completely connected (but powered down) system, you can check for correct LAN termination by measuring the resistance across the D+ and D− terminals:

- 0 Ω indicates a short circuit in the cabling

- 160 Ω or less indicates that too many devices are terminated

- 220 Ω is good

- 470 Ω or more indicates that not enough devices are terminated

Lock power

Additional power for locks can be supplied from a Network Access Controller via the 2-pin plug-in lock power socket (Figure 2 on page 8, item 8). Connect a 2-way lock power cable (supplied) to the 2-pin plug-in lock power socket to provide additional power for locks.

Refer to Figure 3 on page 10 for example connections of the 2-way lock power cable from a Network Access Controller to the Interface (items A and C).

Note: Refer to the *TS1066 Network Access Controller Installation Manual* for information on the maximum total current draw allowed from a Network Access Controller.

Door lock relay wiring

Figure 4 below details the wiring for the relay terminal blocks.

Figure 4: Door lock wiring options (relay shown de-energised)
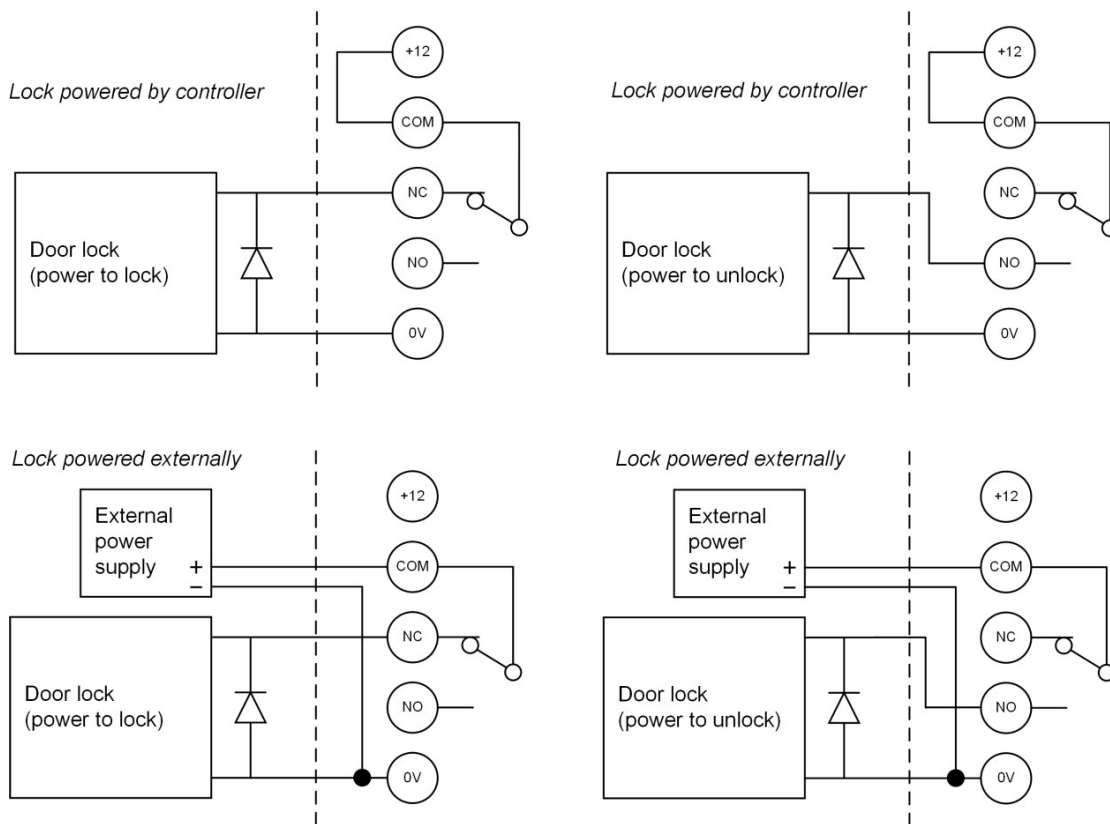
Note: A suppression diode such as 1N4004 must be used in door lock circuits. The diode must be co-located with the lock.

When powering locks from an external power supply or using the relays for other purposes, the relay contact rating must be observed.

Maximum switching capacity (resistive/load): 3A, 30VDC.

Minimum switching capacity: 100mA, 5VDC

Inputs

Each pair of input terminals may be connected to a device such as a detector or reed switch.

The Challenger*Plus* panel or Network Access Controller can monitor its input circuits for four states (sealed, unsealed, open circuit, and short circuit). This is accomplished by using two end-of-line (EOL) resistors in each input circuit, as shown in Figure 5 on page 13.

Note: Challenger*Plus* panels and Network Access Controllers can have various EOL resistor values for input tamper monitoring (the default is 10 kΩ resistors). EOL resistor values for Challenger*Plus* panels or NAC can be programmed using CTPlus (*Panel Programming -> Panel Options -> System Options ->Setup menu*).

EOL resistor values for Dual Weigand Interface can be different to Challenger*Plus* panel or Network Access Controller it is connected to and must be set within the device using CTPlus or RAS install menu.

Install EOL resistors in input circuits at the end of the circuit. If an alarm device is connected, place the EOL resistors at the device's connections. If an input is not used, you do not need to connect an EOL resistor.

Tip: Use sleeves on the resistor leads to prevent accidental shorting.
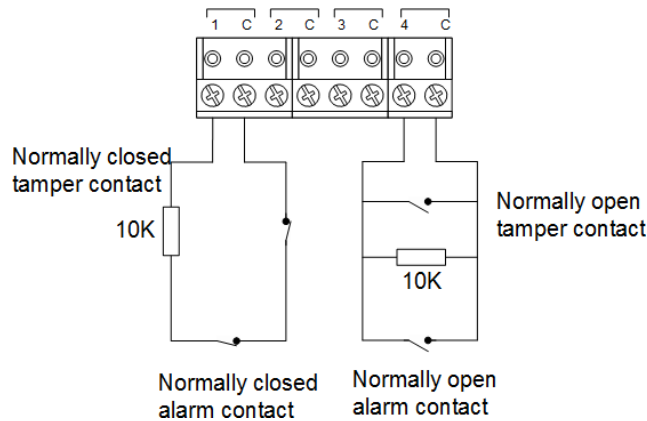
Figure 5: Four-state monitored input circuits
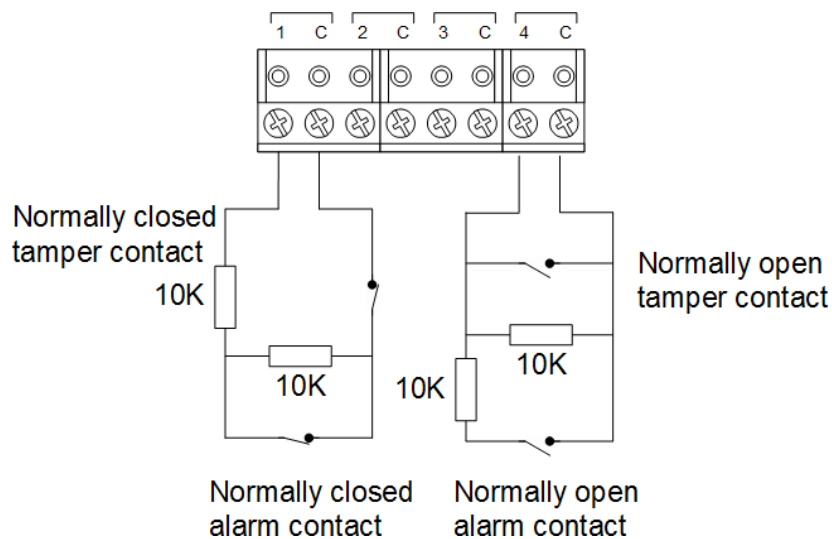
When four-state monitoring is used, the panel uses the circuit's resistance to determine the state of the input. In this example, 10 kΩ EOL resistors have been used:

- 10 kΩ indicates sealed
- 5 kΩ or 20 kΩ indicates unsealed
- Open circuit indicates input tamper
- Short circuit indicates input tamper

To use four-state monitoring, input tamper monitoring must be set to Yes for the Challenger*Plus* panel or Network Access Controller. See the *ChallengerPlus Programming Manual* or the *TS1066 Network Access Controller Programming Manual*, respectively, for information on enabling tamper monitoring.

Alternatively, the Challenger*Plus* panel or Network Access Controller can be configured to monitor inputs for two states (sealed and unsealed). This is accomplished by using one resistor in each circuit, as shown in Figure 6 on page 14.

Figure 6: Two-state monitored input circuits

The panel uses the circuit's resistance to determine the state of the input. In this example, 10 kΩ EOL resistors have been used:

- 10 kΩ indicates sealed

- Open circuit or short circuit indicates unsealed

To use two-state monitoring, tamper monitoring must be disabled for the Challenger*Plus* panel or Network Access Controller. See the *ChallengerPlus Programming Manual* or the *TS1066 Network Access Controller Programming Manual*, respectively, for information on disabling tamper monitoring.
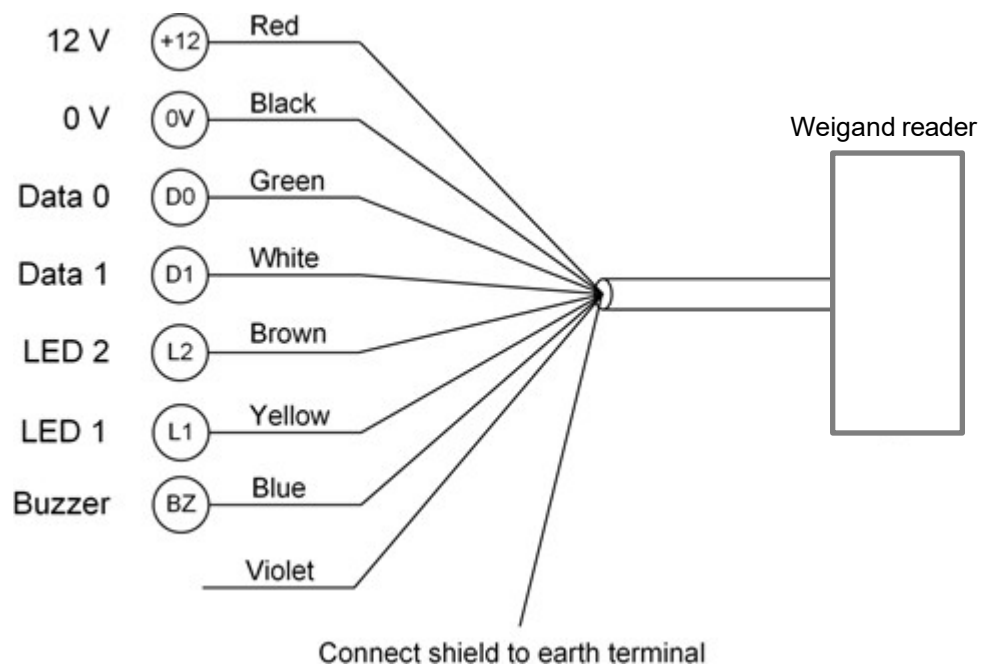
Note: Two-state monitoring is not compatible with input types 33 or 40. See the *ChallengerPlus Programming Manual* for details.

Wiegand reader connections

The TS1061 Dual Wiegand Interface can have two Wiegand devices, such as readers, connected to terminal blocks shown on Figure 2 on page 8, item 12.

Figure 7 on page 15 details typical Wiegand reader wiring.

Figure 7: Connecting a typical reader as a Wiegand device

12 V	(+12)	Red
0 V	(0V)	Black
Data 0	(D0)	Green
Data 1	(D1)	White
LED 2	(L2)	Brown
LED 1	(L1)	Yellow
Buzzer	(BZ)	Blue
		Violet

Weigand reader

Connect shield to earth terminal

Note: Refer to *MAINST-TS0862 TS0862 Smart Door Controller Installation Instructions* manual for cable type and distance recommendations.

Door wiring example

Figure 8 on page 17 consolidates the different connections of a TS1061 Dual Wiegand Interface into one diagram. It shows an example of using the Interface to connect to various parts of a door:

- The door's contact is connected to the first input on the Interface (Figure 2 on page 8, item 10)

- The door's egress button, on the other side of the wall, is connected to the second input on the Interface (Figure 2 on page 8, item 10)

- The door's card reader is connected to the first set of Wiegand reader connections (Figure 2 on page 8, item 12)

- The door's lock is connected to the first relay on the Interface (Figure 2 on page 8, item 9)

The figure shows references to other figures in this document that provide additional wiring information.

The figure indicates that a second set of connections (relay, Wiegand reader, and inputs) can be used for a second door.

The figure also indicates that the Interface is connected to a Challenger*Plus* panel or Network Access Controller.

Figure 8: Door wiring example
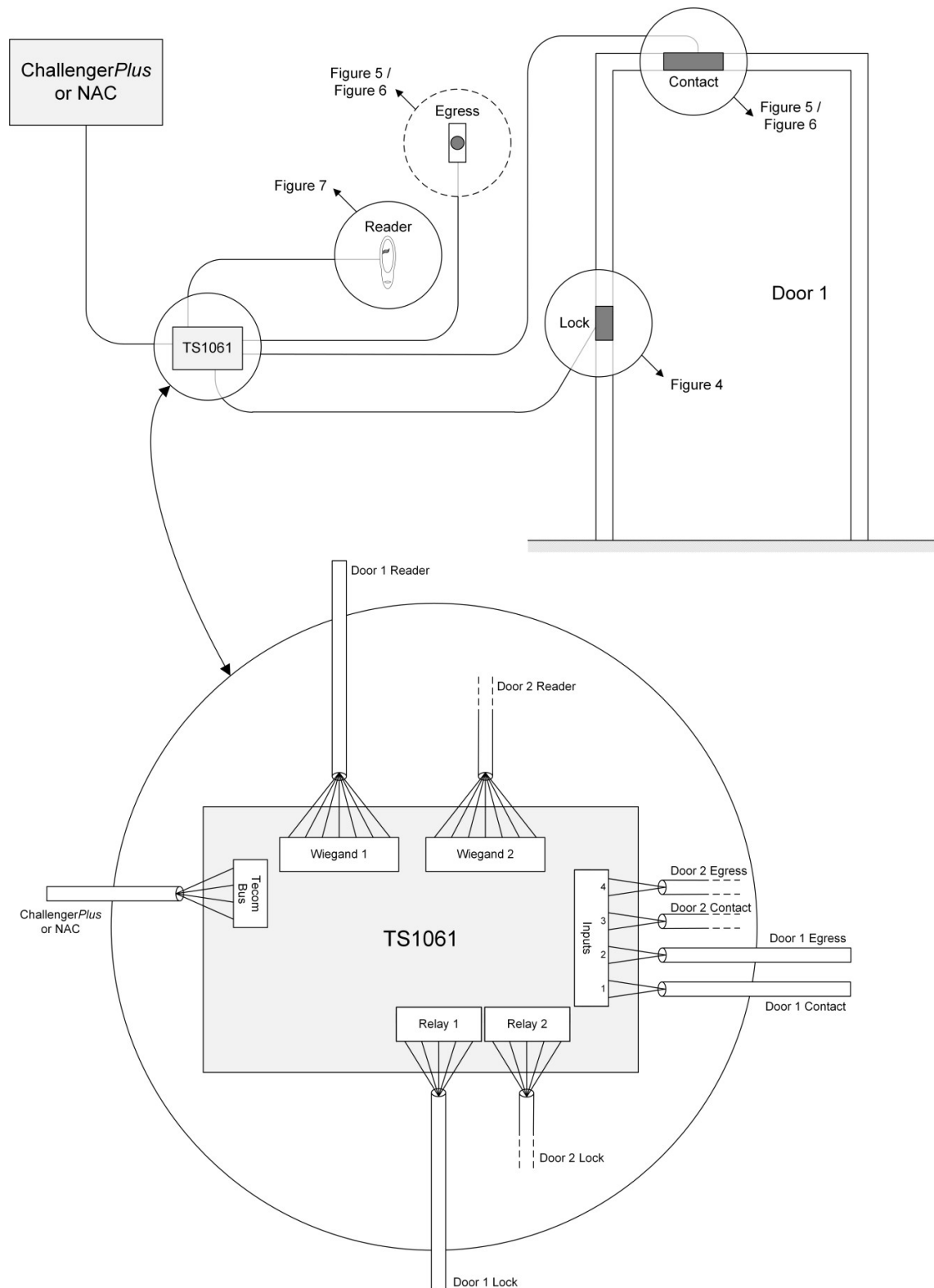
Earthing

Align the ring terminal of the supplied earth lead with the Interface's earth terminal (Figure 2 on page 8, item 11). Use one supplied M3 x 10 pan head screw to fix the earth lead to the Interface.

Attach the spade terminal of the earth lead to one of the earth tabs on the transformer in the enclosure. See the *ENC-LGE Large Enclosure Installation Manual* for more information.

Figure 9 below shows the earth leads in an example configuration of four TS1061 Dual Wiegand Interfaces in an ENC-LGE Large Enclosure, with a TS1066 Network Access Controller.

Figure 9: Example TS1061 earth wiring in ENC-LGE
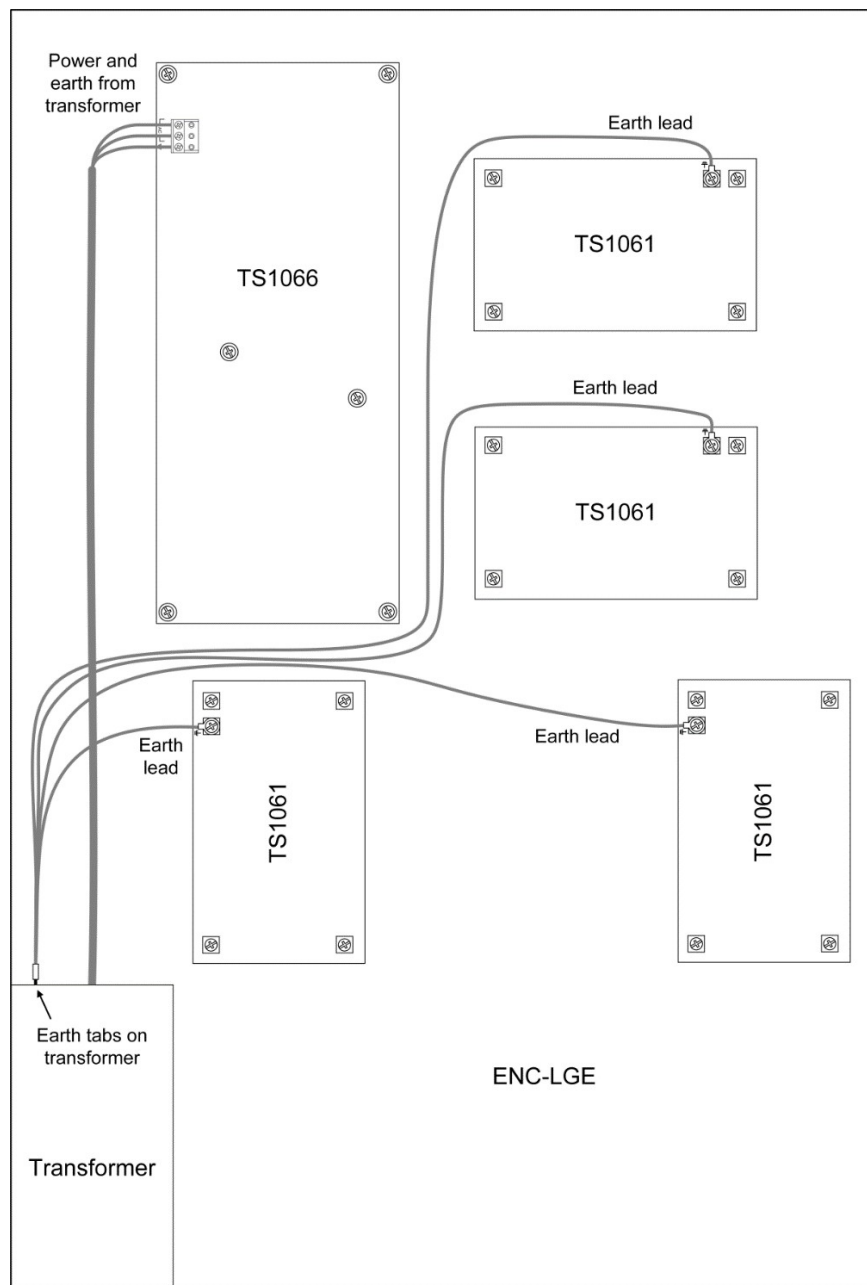
LED indications

LEDs on the printed circuit board indicate the state of the Interface and the connection to the Challenger*Plus* panel or Network Access Controller.

- Heart Beat LED (Figure 2 on page 8, item 15) flashing slowly indicates normal operation.

- Rx LED (Figure 2 on page 8, item 5) flashing indicates polling data being received from the Challenger*Plus* panel or Network Access Controller on the bus.

- Tx LED (Figure 2 on page 8, item 4) flashing indicates the Interface is replying to polling from the Challenger*Plus* panel or Network Access Controller on the bus. Off indicates that the Interface is not correctly addressed, and/or that the Challenger*Plus* panel / Network Access Controller are not programmed to poll the Interface's DGP address.

Appendix A: Standalone current draw

The current draw of the standalone board is 73mA from a 12V supply.

The board is configured as follows and is operating normally:

• Standalone operation (no external loads attached)

• The tamper input is sealed (wire link, 0 Ω)

• All four inputs are sealed (10 kΩ EOL resistors)

• The two on-board relays are not active

• USB is not connected

• The RS-485 system LAN is terminated and is connected to a terminated BUS port of TS1066 Network Access Controller.

Appendix B: User current draw

An on-board fuse provides over-current protection for the two Wiegand reader connections (Figure 2 on page 8, item 12), with a combined maximum current draw of 450 mA.

The maximum current draw for the relays is determined by the TS1066 Network Access Controller or TS-CHPLUS Challenger*Plus* panel that the Interface is connected to.

Appendix C: Operating temperature

The operating room temperature for the Interface is 0 to 50°C. It is recommended that if the Interface is to operate for prolonged periods in an operating environment with a room temperature above 40°C, de-rate the user current drawn from the Interface according to the chart in Figure 10 below.

Figure 10: Power derating chart
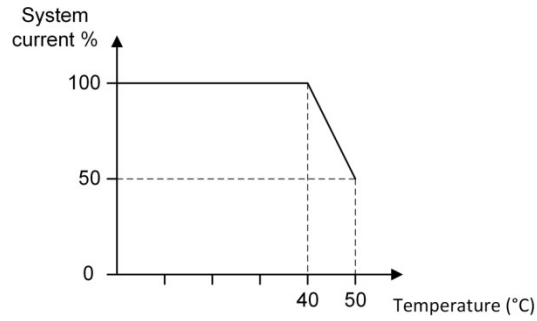
Appendix D: Cabling requirements

This section contains recommendations for installers and electricians for the application and wiring of Challenger equipment with respect to:

- System earthing
- RS-485 cabling

System earthing

TS1061 Dual Wiegand Interfaces can be connected to a Challenger*Plus* control panel or Network Access Controller. Follow the system earthing recommendations provided in the *ChallengerPlus Installation and Quick Programming Manual*, or *TS1066 Network Access Controller Installation Manual*, respectively.

RS-485 cabling

The cabling recommendations for the RS-485 LAN/bus are:

- Use 2-pair twisted shielded data cable such as Belden 8723.
- In each segment of LAN cabling, connect one end only of the data cable shield to a device's LAN earth terminal. Join data cable shields where cable extends past a device that doesn't have a LAN earth connection.
- The length of the LAN cable run must not exceed 1.5 km.

Power supply to RS-485 devices

Devices on the ChallengerPlus panel or Network Access Controller's buses may be supplied from the 12V DC LAN output. Use an external 12 V power supply (such as TS0073 2 A Power Supply) when:

- The device is more than 100 m (data cable length) from the panel
- Electrical isolation is required
- More power is needed than can be provided by the LAN

When powering a LAN device from an external 12 V power supply:

- Connect the external power supply '+' terminal to the device '+' terminal. Do not connect the power supply '+' to the LAN '+'.
- Connect the external power supply '−' terminal to the device '−' terminal.
- Connect the LAN cable black wire '−' to the device '−' terminal.