

DOOR ACCESS CONTROL

DCU SERIES CONTROL UNITS & NETWORKING ADAPTERS

GENERAL

Best results will be achieved when following and adhering to these instruction. A wiring diagram with extensive notations is included that details all the common associated devices that may be required for each door installation. A more comprehensive hardware installation manual is available to download, from our website or on request by email.

UNPACKING

Each Door Control Unit (DCU) is supplied with the PCB separated from the plastic enclosure in an anti-static sealed bag. This permits the mounting of the enclosure in position prior to the PCB being required. Additionally, there are various accessories supplied to aid correct installation. You should have the following items supplied in the packaging:

- Door Control Unit (DCU) PCB
- Clock CR1216 Lithium Cell (Insert in PCB Positive Contact Up)
- ABS Wall Mounting Plastic Enclosure c/w Lid & Screws
- Unidirectional Electric Locking Suppressor Diode
- 4 x Clear Cable Ties

POWER SUPPLY

Each DCU (Door Control Unit) must be powered from a local single low voltage DC regulated supply. The voltage input range must be between 8 and 16 Volts DC as ratings outside of these may cause damage to the control unit and its associated devices. The DCU has been designed for low power economic continuous operation. Its quiescent current is only 70mA rising to 150mA, with both proximity readers connected and the lock (relay 1) and alarm (relay 2) energised.

PLANNING

The DCU is designed to be installed locally to the door or entrance in a dry internal location. All connections are made by removable screw terminals for multi-stranded cable types. For all connections, apart from the networking cable and readers, you may use low cost intruder alarm cable. Ensure that all cables entering the DCU are not coiled up inside the housing, but routed efficiently through the various cable entry points of the enclosure. Please also ensure, that the rear enclosure wall mounting screws, do not touch the PCB when mounted on the locating points.

DOOR CONTROL UNIT SEGMENT INTERCONNECT

The DCU door networking cable type should be Belden type or equivalent #8132 or #9842. These cables are of a multi-stranded construction and have good resistance to mechanical stress. The use of CAT5 or similar cable is not recommended, as its solid core construction breaks easily under mild mechanical stress and is not designed for screw termination use. The total door cable networking length must not exceed 1200M (per adapter segment) and must not contain any spurs or star points. If your network length is less than 100M then low cost 6-core screened or non screened security cable may be used.

END-OF-LINE NETWORKING TERMINATION

In the last DCU, which is the one furthest away from the Networking Adapter connection, you must connect the end-of-line 120ohm terminating resistors. Connect the resistors, one across the last DCU terminals T+ and T- and the other across R+ and R-. To check that the terminations are within the correct range, you can measure between 60-70 Ohms across the T pair and similarly across the R pair. The exact readings will depend on the total DCU network cabling distance. If this is not the case then look for cabling errors throughout the network installation.

RELAY 2

The RELAY2 output can be used to indicate if the door or entrance is in an alarm state. An alarm state condition is generated when the door magnetic contact is fitted and the door is forced open or held open too long. Any general purpose sounder or other device may be switched with a rating no greater than 28VDC at 2 Amps.

REQUEST TO EXIT BUTTON

The Request to Exit Input is normally used if an Exit Request Button is required to exit through the controlled door. It can also be reassigned depending on your system type, for a range of other functions. The options are intruder alarm system or zones set detect, power supply fault detect, general tamper input detect, break glass release activation and lastly, unlock (free access) to ALL system doors on a single closing contact. By default, the operation is set as a Request to Exit Button with a push-to-make momentary switch. If the function is later reassigned by the software application, all functions are normally open with a closing circuit for an active state. Never apply a voltage of any kind to this or any input, as irreparable damage to the control unit may occur.

ELECTRIC LOCKING

The Electric Locking Device is connected and controlled by RELAY1. The DCU can support FAIL SAFE (power to lock) and FAIL SECURE (power to unlock) type devices. The connection terminals of RELAY1 differ depending on the type used, so please consult the wiring diagram on the following leaf. RELAY1 can also be used volt free, for connection to a gate or barrier controller. In this case, ensure that the link to the common (CM) of RELAY1 is not implemented. For electronic locking devices without internal EMF suppression a unidirectional diode is provided. Please see the wiring diagram for exact usage.

DOOR NETWORKING RS485 ADAPTER CONNECTIONS

The DCU interconnected network is connected to the relevant Networking Adapter at the first DCU in the multi-drop line. At the opposing end of the network or network segment, connect the supplied end-of-line 120 Ohm terminating resistors across T+ / T- and R+ / R-. Please take care to identify the type of Network Adapter(s) you have as the connection detail alters.

<u>USB-485-ISO-TB</u>	<u>FIRST DCU</u>	<u>NEXT DCU...</u>
T+	T+	T+
T-	T-	T-
R+	R+	R+
R-	R-	R-
G (Screen)	G (Screen)	G (Screen)

You will need to terminate the USB Adapter 1.8M cable end directly to the interface PCB on this model. Terminate each wired colour to the appropriate marked screw terminal on the 6-way PCB connector. Always make these terminations when the USB socket is UNPLUGGED from the USB port.

<u>USB-485-RPI-TB</u>	<u>FIRST DCU</u>	<u>NEXT DCU...</u>
T+	T+	T+
T-	T-	T-
R+	R+	R+
R-	R-	R-
G (Screen)	G (Screen)	G (Screen)
+12	+ (T6 Power)	no connection

This USB-RS485 adapter requires the 3-wire USB lead to be terminated to the USB-RPI push-pin header on the interface PCB. The three coloured cable connections are clearly marked. Also ensure that link LK3 is removed if not already from the factory. Always make these terminations when the USB socket is UNPLUGGED from the USB port.

<u>LAN-IP-485-TB</u>	<u>FIRST DCU</u>	<u>NEXT DCU...</u>
T+	T+	T+
T-	T-	T-
R+	R+	R+
R-	R-	R-
G (Screen)	G (Screen)	G (Screen)
+12	+ (T6 Power)	no connection

DCU INSTALLATION LOCAL TESTING

Each DCU can be tested in isolation to confirm correct installation. The Electric Lock, Exit Request Button, Magnetic Door Contact, Relay 1, Relay 2 and both Proximity Door Readers can be simply checked for basic local operation prior to system commissioning.

1 - To test that the Door Lock (RELAY 1) is operating correctly, briefly press the Request to Exit Button. The Door Lock should unlock for approximately 5 seconds (factory default) and then relock automatically.

2 - To test the Door Lock (RELAY 1) and the Alarm Output (RELAY 2), briefly press the Request to Exit Button and then open the door, thus opening the Magnetic Door Contact. The Door Lock should relock after 5 seconds (factory default). Leaving the door held open (ajar), after 20 seconds (factory default) a Door Held Open condition will be detected, which will activate RELAY2 the Alarm Output.

3 - To test each Door Proximity Reader (entry and exit), present a compatible access control card or key-tag to each reader in turn. The reader should beep and flash green briefly, to indicate the reader has read the card or key-tag. After a couple of seconds the DCU will flash the reader red light to green 5 times, to indicate that the card or key-tag has been read, but is unknown to the door (access denied).

DOOR CONTROL UNIT SERIAL ID

Each DCU is uniquely serial numbered at the factory with a 6-digit electronic identifier. This allows each DCU to be associated independently by the system on the common 5-wire network or network segments. The serial number on the PCB should be noted along with a descriptive name for the door that the DCU controls.

SERIAL NUMBER: _____ (e.g. FFB005)

DESCRIPTION: _____ (e.g. Front Door)

DCU Series Technical Specification	
Supply Voltage	8 – 16VDC
Current Consumption	150mA Maximum (2 readers)
Relay Contacts	28VDC 2Amp Inductive (Form C)
RS485 Wired Interconnect	Full Duplex 5-Wire 56K Baud
Door Reader Inputs (2)	Wiegand 26Bit (space < 550uS)
Request to Exit Input	Normally Open, Push to Make
Door Monitor Contact Input	Normally Closed (open door ajar)
Clock & Calendar	24 Hour + Day + DD:MM:YYYY
Data Volatility	> 10 Years
IP Rating	IP44 (Internal)
Screw Terminals	Rising Clamp Stainless Steel
Real Time Clock Cell	CR1216 (Lithium, dispose responsibly)
DCU Series Cable Specification	
RS485 Cable Type	Belden #8132 or #9842 (MAX 1.2KM)
Door Reader Cable Type	Belden #9535 or similar (MAX 75M)
Locking & Contact & Inputs	Non screened General Purpose Cable



RS485 WIRED DOOR NETWORK

< FROM PREVIOUS DOOR OR ADAPTER TO NEXT DOOR >



CABLE COLOURS

T+ BLUE / WHITE
T- WHITE / BLUE
R+ ORANGE / WHITE
R- WHITE / ORANGE
G SCREEN

DUAL TWISTED PAIR + SCREEN
- USE BELDEN 8132 or 9842

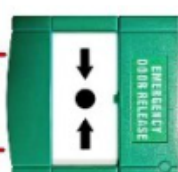
PRESS TO EXIT BUTTON
(PUSH TO MAKE TYPE, OPTIONAL)



DOOR MAGNETIC CONTACT
(N/C DOOR CLOSED, OPTIONAL)



EMERGENCY DOOR RELEASE
(N/C AT REST, ONLY REQUIRED FOR FAIL-SAFE POWER LOCKED DEVICES)



ELECTROMAGNETIC LOCKING
(FAIL-SAFE POWER LOCKED SHOWN)



INSTALL LOCKING DIODE SUPPRESSOR

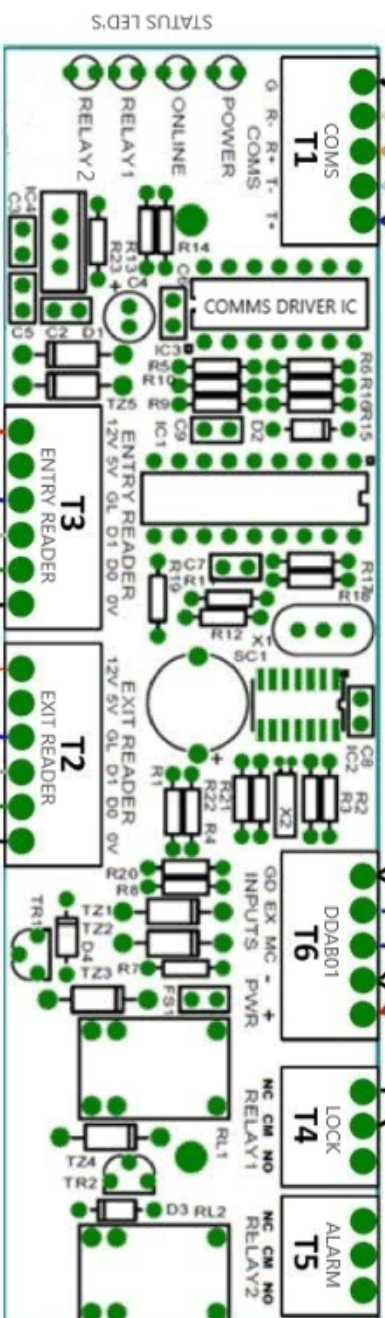
For electromagnet locking devices without internal back-emf suppression components installed, please fit the supplied power diode directly at the locking device supply terminals. This component is polarity sensitive and must be installed correctly. Connect the cathode terminal, that is denoted by the white band to the positive supply of the locking device. The anode is connected to the negative supply of the locking device. Failure to provide adequate suppression can cause erratic and / or damage to associated electronic devices and circuits!

ELECTROMAGNETIC LOCK WIRING

The diagram shows a fail-safe (power to lock) locking device by default. For fail-secure (power to unlock) types please move the wire in terminal NC to NO on connector block T4.

PRESS TO EXIT BUTTON

This should be a push-to-make type going closed circuit when pressed. Never keep this input closed for long periods as the door will remain unlocked.



CARD READER WIRING

BLACK - OV
GREEN - D0
WHITE - D1
BLUE - GL
RED - 12V

Please ensure all unused reader wires are insulated from others to avoid contact.

EXIT CARD READER
(OPTIONAL)



ENTRY CARD READER



POWER SUPPLY UNIT

(9 - 12 VOLT DC)
Connect low voltage DC output to terminal T6 'PWR'.

USE A BATTERY FOR FAIL-SAFE LOCKING