MANUAL
Connection Unit

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1 Purpose and application

This connection unit package contains the following components:

- Wall plate assembly.
- Bottom plate.
- Cover.
- PCB (with USB extension board*).
- CD-Rom containing the USB driver*.
- USB type A to USB type B cable*.
- Installation manual.

The connection unit is an installation friendly device which enables to:

- Connect multiple RS485 devices which use the Cross Point Field Bus
- Connect multiple XM3 units in a network.

Two versions of the connection unit are available:

- The standard connection unit.
- The advanced connection unit which enables to connect a RS485 network to a computer through USB.

The following features are provided by the connection unit:

- Connect multiple Cross Point devices to a RS485 network.
- USB extension board to connect RS485 device(s) to the PC*.
- A relay to provide extended security.
- Output for an additional relay.
- Possibility to connect a bioscrypt reader (XM3 only).
- Removable connectors.

* Only available with the advanced connection unit.

2   Specifications

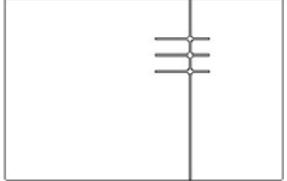In Table 1 the specifications of the connection unit are given.

	Technical specifications	
	Dimensions	150 x 100 x 31.6 mm (5.9 x 3.9 x 1.2 inch)
	Current consumption	Max 100 mA
	Input Voltage	8 – 15 Volt
	Temperature range	0 - 60 °C
	External Power supply Specifications	Input: 100 – 240V / 400mA Output: When using XM3 : 12VDC ± 0.5V / 1 A Max When using RFAPP devices: 15VDC ±5% / 1 A Max

Table 1: Specification of the connection unit

NOTE   When connecting a XM3, the input voltage should not exceed 12V.

The connection unit is equipped with a self resetable fuse. This fuse prevents the XM3 to be damaged by a current overload.

3 Mounting the connection unit

See Figure 1 for mounting details.

    A. Take the wall plate assembly and mark the position of the mounting holes on the wall. The arrows on the front site of the wall plate should point upwards. Drill the holes (Ø 5mm), apply the plugs (S5) and mount the wall plate assembly.

    B. The connectors J4, J5, J7 and J8 (see Figure 2) can be removed from the printed circuit board in order to make the necessary connections. In order to create a cable outlet, break away the interstice(s) from the bottom plate. Apply the bottom plate including the printed circuit board on the wall plate.

    C. Set the dipswitch settings (see Table 5) and place the cover.
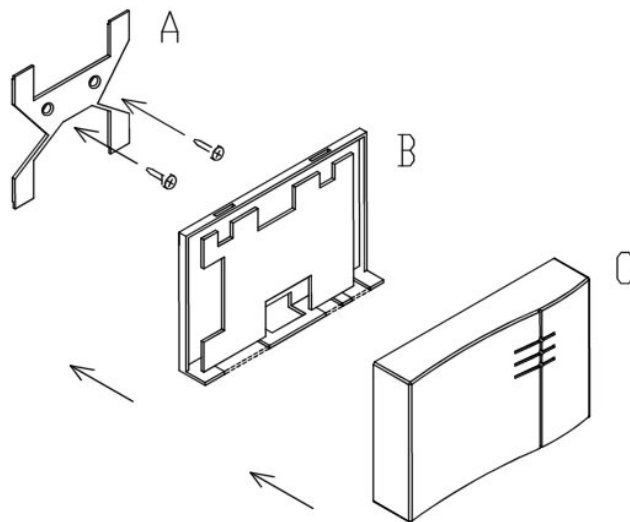

Figure 1: Mounting the connection unit

4 IO's and connectors

Figure 2 shows the layout of the terminals, DIP-switches, connectors, relay and LED's of the printed circuit board assembly.
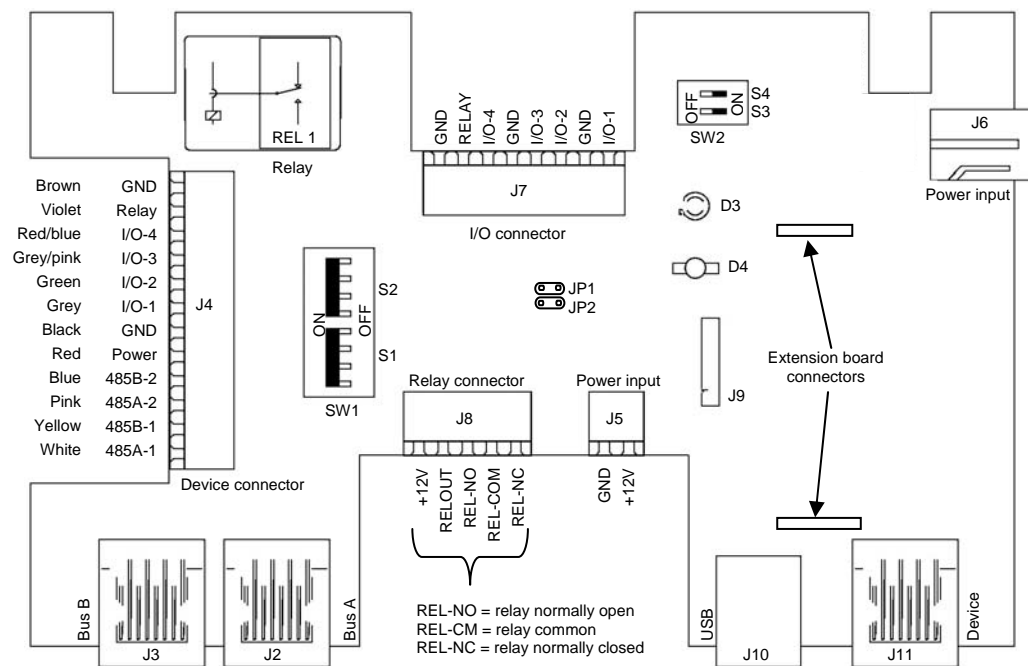

Figure 2: Layout of the connection unit PCB

4.1 Connectors

The connection unit is equipped with several connectors. The functionality of each connection is described in Table 2.

Connector	Function
J2	Bus A, used for building a RS485 network.
J3	Bus B, used for building a RS485 network.
J4	Connection to XM3 or XM13.56 or other devices without RJ-45 connector.
J5	Power input and ground.
J6	Power input and ground.
J7	I/O's for XM3 or XM13.56.
J8	Connection to external relay REL1.
J9	Reserved.
J10	USB Connector type B (enabled when using the USB extension board).
J11	Connector to device using RJ-45 connector (See Table 3).

Table 2: Functionality of each connector.

NOTE J4 and J11 are mutually exclusive.

The pin layout of J11 is described in Table 3.

Pin	Function
1	485A-1
2	485B-1
3	485A-2
4	Power
5	GND
6	485B-2
7	Power
8	GND

Table 3: Pin layout of J11

4.2 I/O'S

The connection unit supports up to four I/O's which can be connected to J4. The four I/O's from J4 are connected to the four corresponding I/O's of J7.

4.3 Relay

The connection unit is provided with a relay REL1. The absolute maximum ratings for the relay are mentioned in Table 4.

Absolute maximum ratings (resistive load)	value
Max. switching power	60 VA
Max. switching voltage	30 VDC
Max. switching current	2 A

Table 4: Absolute maximum ratings

When a maximum switching current of 2A is not sufficient, an additional (external) relay can be connected to RELOUT (see Figure 2).

NOTE   Output RELOUT is an open collector output with a maximum current of 50mA. This output is not shortcut protected.

4.4   Dipswitch settings

The connection unit is equipped with four dipswitches which are described in Table 5.

Switch	ON	OFF
S1	Terminate bus B (J3), apply when the connection unit is the first or the last in a network.	Bus B (J3) not terminated.
S2	No device is connected to J4 or J11. Bus A (J2) is directly connected to bus B (J3).	A device is connected to connector J4 or J11
S3	Relay is triggered by external signal on the RELAY input of J4 (see Figure 2). Signal low = Relay on.	Relay is triggered by a coded signal on the RELAY input of J4 (see Figure 2).
S4	Power from the connection unit is supplied to the RS485 network.	The RS485 network is not powered by the connection unit.

Table 5: Dipswitch settings

Whenever a setting of dipswitch S1 or S2 changes, LED D4 changes color, refer to Table 7.

4.5 LED'S

The connection unit is equipped with two LED's, D3 and D4. LED D3 indicates the status of the power on the bus. LED D4 indicates the settings of the switches S1 and S2. Table 6 describes the behaviour of LED D3 and Table 7 describes the status of LED D4.

Voltage	LED behaviour
Voltage < 8.5V	Flashing LED
8.5V < Voltage < 12V	Blinking LED
Voltage > 12V	LED on

Table 6: Behavior of LED D3.

LED status	Switch S1	Status	Switch S2	Status
OFF	OFF	Bus B (J3) is not terminated.	OFF	A device should be connected to J4 or J11
Red	OFF	Bus B (J3) is not terminated.	ON	Bus A connected to Bus B
Green	ON	Bus B (J3) is terminated.	OFF	A device should be connected to J4 or J11
Red / Green	ON	Bus B (J3) terminated.	ON	Bus A connected to Bus B

Table 7: LED D4 indicates the status of switch S1 and S2.

4.6 Jumpers

When the two pins of JP1 are connected and the two pins of JP2 are connected by jumpers, a **Bioscrypt** fingerprint reader can be attached to J7 when using a XM3.

5   Connecting devices

An advanced connection unit should be the first unit in a network with a maximum of 31 devices when a RS485/USB conversion is established (see Figure 3). When building a RS485 network, the connection units should be connected by FTP cable.
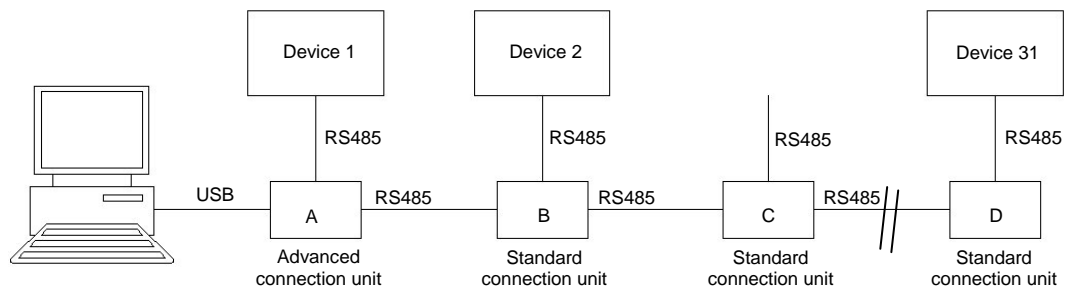

Figure 3: Devices in a network.

When a RS485 network is built using the connection unit, the following connection unit configurations (see Figure 3) are possible.

1. An advanced connection unit A is connected to a PC and Device 1 is present on J4 or J11. The advanced connection unit is connected to a standard connection unit B. S1 and S4 must be switched ON. Normally an advanced connection unit is placed within 3 meters (USB specifications) from the PC, and therefore a device is not always connected to this advanced connection unit. Is this the case, switch S2 in the ON position.

2. A standard connection unit B is connected to the advanced connection unit A (on J2) and standard connection unit C (on J3). Device 2 is connected to J4 or J11. Switch S1 and S2 must be switched OFF, S4 must be switched ON.

3. A device, which is normally connected to a standard connection unit C, is removed (temporary). The standard connection unit is connected to the standard connection unit B and standard connection unit D. Switch S1 must be switched OFF, S2 and S4 must be switched ON.

4. A standard connection unit D is connected to the standard connection unit C (on J2), no connection unit is connected on J3. Device 31 is present to J4 or J11. Switch S1 and S4 must be switched ON, the bus is terminated.

A power supply must be connected to one or more connection units. It is preferred to connect a power supply to the advanced connection unit. When LED D3 of any of the connection unit starts blinking, connect a new power supply.

6   XM3 connection

When a network of XM3 readers is built, the XM3 reader is connected to the connection unit via connector J4.The Bioscrypt fingerprint reader can be enabled by connecting the pins of JP1 and connecting the pins of JP2. The Bioscrypt reader is connected to the I/O's on J7.

NOTE   When a network of XM3's is built, the connection unit must be powered by a 12V power supply instead of a 15V power supply.

7 Software installation for the advanced connection unit

A brief description is given in order to install the connection unit on a PC running Windows XP.

1. Insert the provided CD-Rom into the CD-Rom drive.

2. Connect the advanced connection unit with the PC using the provided USB cable.

3. A dialog is displayed where Windows suggests to check for updates. Click **No, not this time** and press the **Next** button (see Figure 4).

Figure 4: Windows suggests to check for updates.

4. A new dialog is displayed. Windows asks where it can find the software. Select **Install from a list or specific location (Advanced)** (see Figure 5). Press the **Next** button.
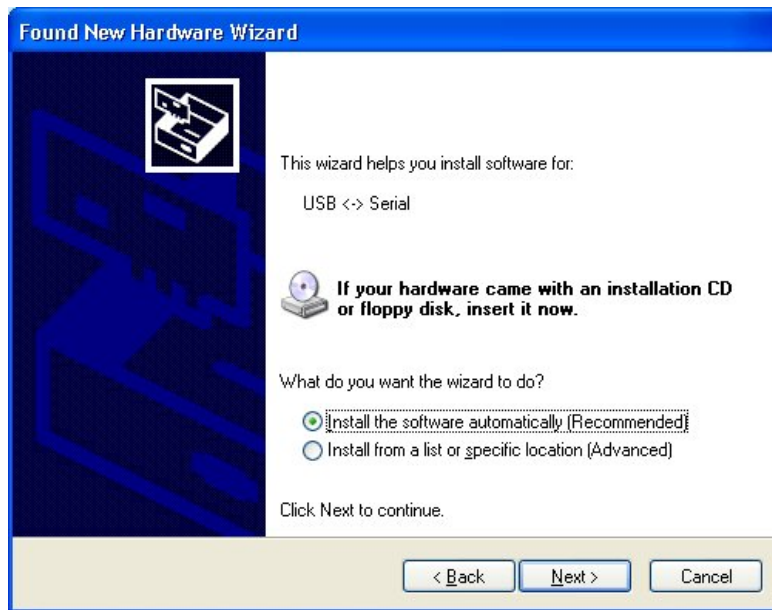
Figure 5: Windows needs to know where to find the software.

5. Windows asks for the location of the driver. Make the settings (see Figure 6). Browse to the CD and click the **Open** button. Press the **Next** button to proceed.
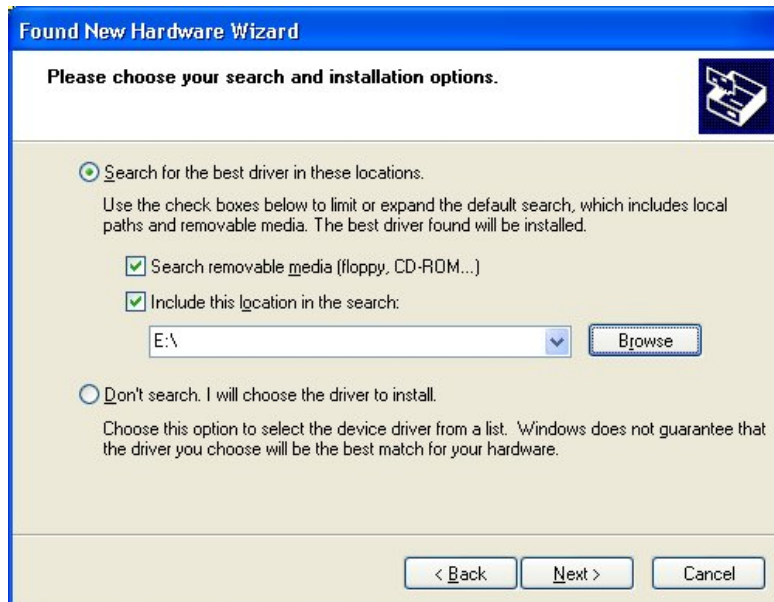

Figure 6: Windows requires the exact location of the driver.

6. Installation of the USB Serial Converter has finished (see Figure 7). Press the **Finish** button.

Figure 7: Installation of the driver has finished.

7. Windows will find new hardware. This time a virtual COM port is installed. Repeat step 3 to 6.

The advanced connection unit is now installed and ready to be used.