CROSS POINT
PROTECTING PEOPLE & ASSETS

TECHNICAL MANUAL

NEXUS Multi Converter

RS-232/RS-485

USB/RS-485

Conditions

Transactions, deliveries et cetera will be according to the general terms of delivery as deposited at the Chamber of Commerce at Meppel, The Netherlands. Registration number is K.v.K. 04058425.

Version 1.0, June 2008

Table of contents

1 Introduction

Cross Point's NEXUS Multi Converter is an easy-to-use multi purpose converter.

It converts RS-232 signals to RS-485 or USB signals to RS-485 and can be used in combination with any Cross Point NEXUS range product.

RJ-45 connectors allow easy and quick installation of the converter and the USB connector and RS-232 DB9 female connector enable multi purpose applications.

Product features:

- Signal conditioning through galvanic separation
- Advanced noise suppression
- Field Bus termination switch
- Auto baud rate detection
- Power supply input and loop through possibility
- Self resetting fuse
- RJ-45 Field Bus connections (A and B bus)
- RS-232 to RS-485 converter (DB9 serial)
- USB to RS-485 converter (USB 1.1 and USB 2.0 compatible)
- LED indicators for power and bus communication
- Multi purpose
- Easy to use and install

2 Specifications

Table 1 shows the specifications of the NEXUS Multi Converter.

Front view

Side view

Technical specifications	
Dimensions	150 x 100 x 31,6 mm (5,9 x 3,9 x 1,2 inch)
Current draw	Max 100 mA
Input voltage	15 VDC
Temperature range	0 - 60 °C
External power supply specifications	Input : 100 – 240VAC / 400mA Output : 15VDC ±5% / 1 A max

Table 1: Specifications

The NEXUS Multi Converter is equipped with a self resetting fuse. This fuse prevents damage to the NEXUS Multi Converter (and other Field Bus devices) by a current overload.

IMPORTANT NOTE:

The NEXUS Multi Converter can only be used in combination with NEXUS devices that support the Field Bus protocol, including auto-baud rate detection.

This means that the NEXUS Multi Converter should NOT be used in combination with Cross Point's Access Control and People Protection products!

3 Mounting the NEXUS Multi Converter

See for Figure 1 for mounting details.

1. 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.
2. 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.

   Connect the power supply (if required) to J3 or J6 (see Figure 2).

   Terminate the Field Bus (dipswitch S1 ON, see Figure 2) if this converter is the first device in the Field Bus.
3. Place the cover and connect the USB or serial cable.

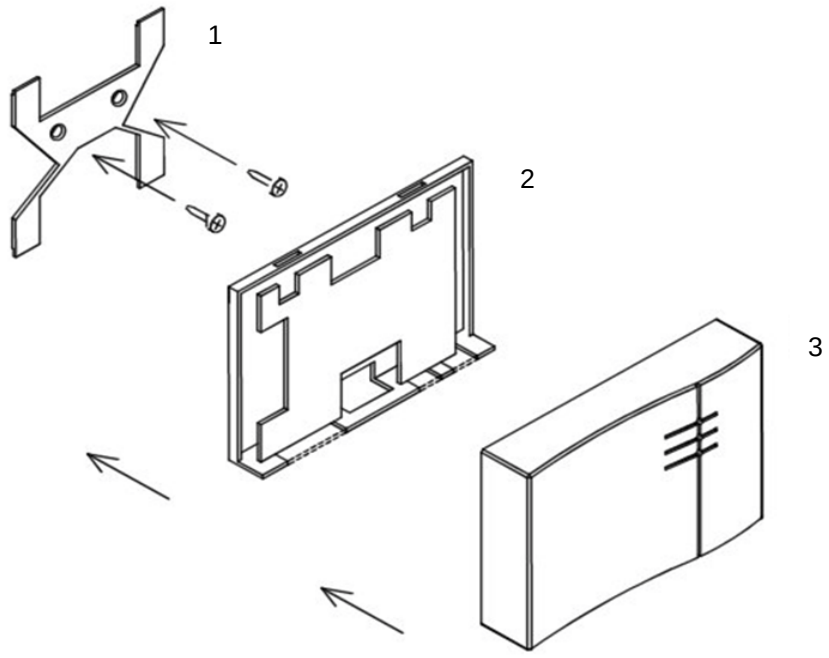

Figure 1: Mounting details

4 PCB components

Figure 2 shows the NEXUS Multi Converter PCB, containing the various connectors and LED indicators.

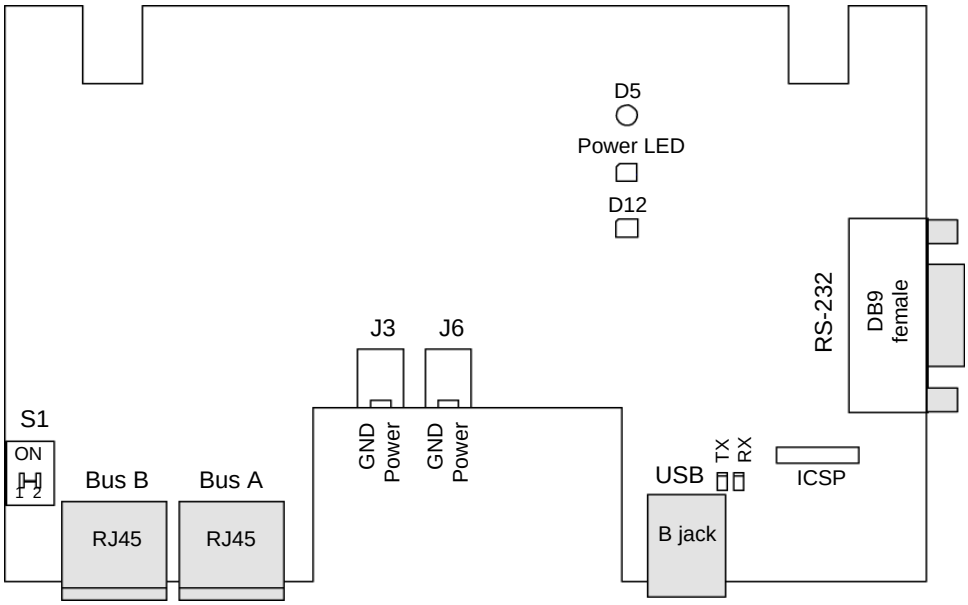

Figure 2: PCB layout

Table 2 shows the function of each PCB component.

Component	Function
Bus A, Bus B	RJ45 connectors for Field Bus connection. **IMPORTANT:** **These connectors can NOT be used for TCP/IP connections!**
D5	Optional bi-color LED (default not placed)
D12	RS-232 communication indicator (bi-color LED). Green ON : baud rate found Green OFF : baud rate lost Red ON : communication from device to host

ICSP	In-circuit programming connector. Only used by Cross Point.
J3	Power supply input connector.
J6	Power supply output connector. If a power supply is connected to J3, the power will also be available at J6 for further distribution (if required).
Power LED	This LED lights green when power is connected to J3 (or optionally J6). **IMPORTANT NOTE:** When only the USB cable is connected (so there is no power supply connected), this LED will also light up. The NEXUS Multi Converter will however not function! Power supply needs to be connected in order for the NEXUS Multi Converter to function properly. See section 5.2 for details on power supply connections.
RS-232	DB9 female connector for serial connection to a computer or controller.
S1	Field Bus termination switch. S1-1 OFF : RS-485 bus is not terminated S1-1 ON : RS-485 bus is terminated S1-2 OFF : Synchronization lines not terminated S1-2 ON : Synchronization lines terminated
TX	USB functionality. This LED lights red when the host (computer/controller) communicates with a device.
RX	USB functionality. This LED lights green when a device communicates with the host (computer/controller).
USB	USB B-type jack for connection of a USB cable.

Table 2: PCB component description

5 Connections and settings

This chapter covers the connection options of the NEXUS Multi Converter as well as the various settings that can be made.

5.1 RS-485 Field Bus

The NEXUS Multi Converter can be connected to the Field Bus in 2 different ways:

1. **At the beginning of the Field Bus**

   In this situation the NEXUS Multi Converter is connected to the PC/controller and it is the first Field Bus device.

   The terminate symbol Ⓣ indicates that the Field Bus on this device needs to be terminated. See chapter 5.5 for further details on Field Bus termination.

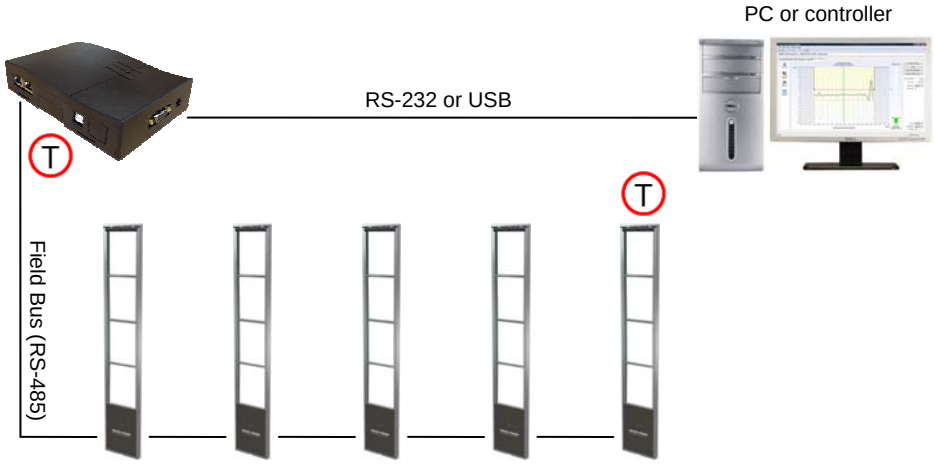

Figure 3: Example 1; NEXUS Multi Converter in beginning of Field Bus

2. Somewhere within the Field Bus

In this situation the NEXUS Multi Converter is connected to the PC/controller but it is **not** the first or last Field bus device since it is connected at some position within the Field Bus.

The terminate symbol Ⓣ indicates that the Field Bus on this device needs to be terminated. See chapter 5.5 for further details on Field Bus termination.

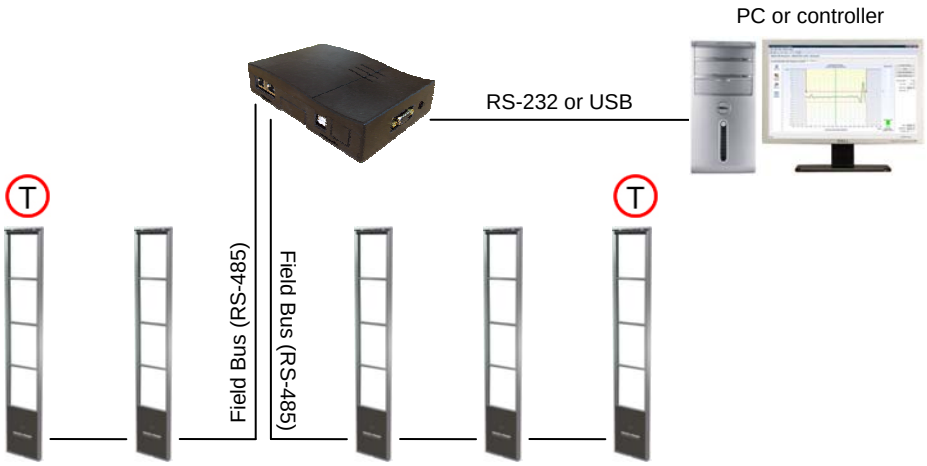

Figure 4: Example 2; NEXUS Multi Converter within the Field Bus

5.2 Power supply

The NEXUS Multi Converter always needs to be supplied with 15VDC power to operate properly.

There are two ways of supplying power to the NEXUS Multi Converter:

1. Using an external power supply (PSU), connected to J3 (or alternatively to J6)
2. Using the Field Bus (through the CAT5 cable connected to BUS A or BUS B)

   In this case you have to make sure that a power supply (PSU) is directly connected to

   a. the first device in front of the NEXUS Multi Converter, or

   b. the first device after the NEXUS Multi Converter.

Figure 5 shows the two power supply options.

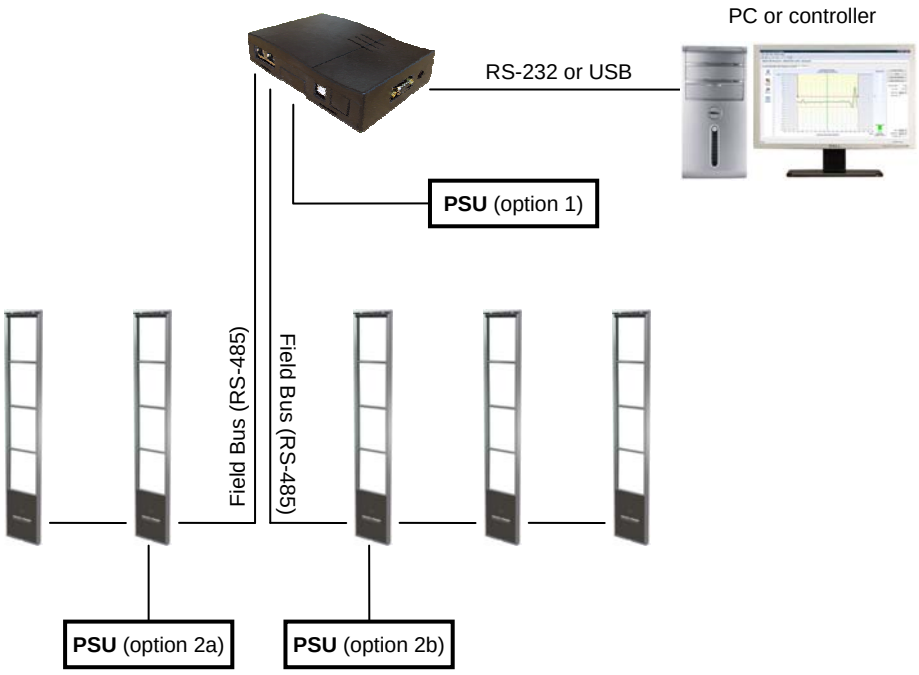

Figure 5: Power supply connection options

5.3 Connection details

Although the NEXUS Multi Converter supports two types of conversion (RS-232/RS-485 and USB/RS-485), it is not possible to use both types at the same time. If the RS-232/RS-485 converter is used and the USB cable is plugged into a computer, the USB converter will be activated and the RS-232 converter will be switched off. The USB converter is always leading.

5.4 Baud rate

The baud rate of the host (computer or controller) is automatically detected by the NEXUS Multi Converter, so there is no need (and therefore no possibility) to set the baud rate manually.

5.5 Field Bus termination

In case the NEXUS Multi Converter is the first Field Bus device (connected directly to the host computer/controller), the Field Bus must be terminated on the NEXUS Multi Converter.

Because the NEXUS Multi Converter is the first Field Bus device in connection example 1 (Figure 3), the Field Bus must be terminated on the NEXUS Multi Converter as indicated with the terminate symbol Ⓣ.

The Field Bus can be terminated using dipswitch S1:

S1-1 OFF : RS-485 lines not terminated

S1-1 ON : RS-485 lines terminated

S1-2 OFF : Synchronization lines not terminated

S1-2 ON : Synchronization lines terminated

Switch **S1-1** (RS-485 lines) and **S1-2** (synchronization lines) to **ON** to terminate the complete Field Bus, or only switch the corresponding switch if you only want to terminate one of the two components of the Field Bus.

The Field Bus must also be terminated on the last device in the bus (also indicated with the terminate symbol Ⓣ). Please refer to the manual of that specific device for details on how to terminate the bus.

IMPORTANT:

Make sure to **NOT** terminate the Field Bus on the NEXUS Multi Converter when the converter is installed within the Field Bus as shown in connection example 2 (Figure 4), as this will have a negative effect on the Field Bus performance! Only the first and last device should be terminated.

6 Driver installation

When using the USB connection, the proper drivers need to be installed for the USB port in order for the NEXUS Multi Converter to work properly.

6.1 USB

In order for the USB converter to work properly, the FTDI drivers need to be installed. These drivers can be downloaded from http://www.crosspoint.nl.

A manual for driver installation under Windows XP is also available as download.

6.2 RS-232

There is no need to install any separate drivers for the RS-232 converter.