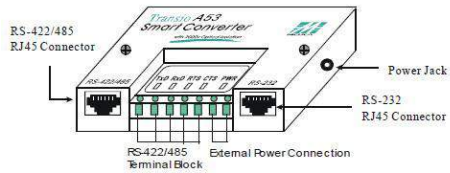# MOXA®

Transio A52/A53
Quick Installation Guide

Eighth Edition, June 2011

Overview

The Transio A52/A53 are smart RS-232 to RS-422/485 bi-directional converters that allow one RS-232 port to be converted into an RS-422 or RS-485 port. With the A52/A53 you can control up to 32 devices within 1.2 km in a multidrop environment.


To ease 2-wire RS-485 half-duplex control, Automatic Data Direction Control (ADDC) intelligence, which does not requires a baudrate switch setting, is designed into each A52/A53 to simplify your RS-485 software programming. Your applications can easily manage data transmitting and receiving via the half-duplex RS-485 port without using additional code. Compared to other products that require using switches to set the clock speed manually, the A52/A53 let you avoid many development and maintenance hassles.

To meet the high reliability required by harsh industrial environments, all RS-422/485 signals provide TVS protection. In addition, the A53 provides 2 KV of optical isolation protection for all signals at the RS-422/485 end.

Features and Specifications

- Serial interface: RS-232, RS-422/485
- Port types: RS-232: RJ45;
  RS-422/485: RJ45 or Terminal Block
- High speed, baudrate up to 921.6 Kbps; no switch setting needed
- Signals:
  RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND;
  RS-422: TxD+(B)/-(A), RxD+(B)/-(A), RTS+(B)/-(A),
  CTS+(B)/-(A), GND;
  RS-485-Data+(B)/-(A), GND
- Supports Automatic Data Direction Control (ADDC) with no baudrate switch settings for RS-485

P/N: 1802000520517

- RS-485 data control modes: auto (ADDC) or by RTS
- RS-422 supports CTS, RTS signals for hardware flow control
- LED indicators for power and 4 signal states (TxD, RxD, RTS, CTS)
- All RS-422/485 signals provide TVS protection.
- All RS-422/485 signals support up to 2 KV (DC) of optical isolation protection (A53 only)
- Provides overloading protection when there are 2 signals shorted together at the RS-422/485 end
- Built-in 120 ohm termination resistors for RS-422/RS-485 (selectable by jumper in RS-485 mode)
- Supports up to 32 units connected in an RS-485 multidrop network
- CE/FCC approval
- 9 V 1.5 A UL 110/230 V power adaptor can support up to 4 converters
- An external power adaptor is required, with input voltage for the converter ranging from DC +9V to +30V.
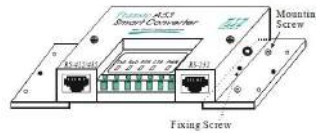
- Operating temperature: 0 to 55°C
- Dimensions: 90 x 60 x 21 mm
- Mounting Kit: Plastic Plates and screws for mounting the A52/A53 on a wall or surface.
- Power consumption: A52: 157 mA max. (+9V); A53: 285 mA max. (+9V)

Applications

- Multipoint data acquisition
- Factory automation
- Remote serial device control
- Building security automation
- Critical industrial control

Installation

Switch and jumper settings

To change the operation mode, remove the two screws on the top of the converter, open the cover, and then use the array of sliding switches to set the desired mode.

DIP switches are used to select the operation mode (RS-422 or RS-485). For RS-485 mode, the control mode (By RTS or ADDC) is also set by DIP switch.
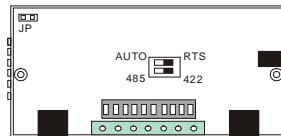
Internal view of A52/A53 (*default settings)

| SW1		SW2	
RS-422 mode	Off	By RTS	Off
RS-485 mode	On*	Auto Data Direction Control (ADDC)	On*

In RS-422 mode, RxD is automatically set with a 120 ohm terminating resistor.

In RS-485 mode, the 120 ohm terminating resistor is set by one jumper.

When shorted, the resistor is enabled.

Basic Communication Wiring

Before placing a converter in an existing network, the converter should be properly configured. The following diagrams show typical layouts for both converters.
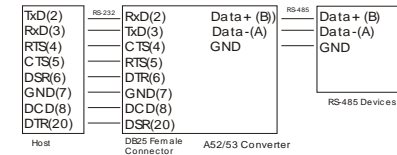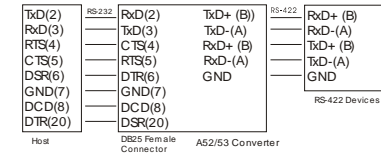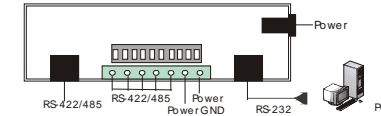
LED Indicators

LED indicators for TxD, RxD, RTS, CTS signals and PWR are located on the top of the A52/A53. The indicator light is NOT lit when there is no signal, or the power is off.
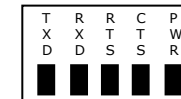
TxD: Shows green when connected and transmitting data from RS-232 to RS-422/485.

RxD: Shows green when connected and receiving data from RS-232 to RS-422/485.

RTS: Shows green when connected and RS-232 RTS Signal is ON.

CTS: Shows green when connected and RS-232 CTS Signal is ON.

PWR: Shows green when the power is ON.

Power Supply

The A52/A53 converters are designed for standard +24 VDC unregulated power for use in industrial environments. Operation is guaranteed when using any power supply between +9 and +30 VDC at 350 mA. An optional power adaptor (9 V 1.5 A UL 110/230 V) can support up to 4 converters (see the following diagram).
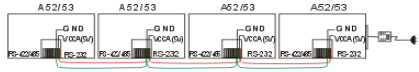
A52/A53 Converter Connection Diagram

RS-232 Pinouts

10-pin RJ45 Jack

The RJ45 port for the RS-232 signal is shown in the following figure.

A52/A53 RJ45 Connector Pinouts

Pin	RS-232	Pin	RS-232
1	DCD (Always On)	6	RxD
2	DSR	7	GND
3	RTS	8	CTS
4	GND	9	DTR
5	TxD	10	---

> **NOTE** Each group of (DTR, DSR) pins are shorted, freeing users from the hardware flow control cable wiring problem. For this reason, we list two types of RS-232 cable wiring below.

Type 1: To connect the RS-232 side of A52/A53 to a DTE (e.g., PC COM1/2) or DCE. (Be sure to check the precise DTE/DCE pinouts. The following DTE/DCE pinouts are just an example.)

|	A52/A53 RJ45	DTE Device DB25 Male	DTE Device DB9 Male	DCE Device DB25 Female	
DCD		8	1	8	DCD
DSR	2	20	4	6	DTR
RTS	3	5	8	4	CTS
GND	4	7	5	7	GND
TxD	5	3	2	2	RxD
RxD	6	2	3	3	TxD
GND	7	7	5	7	GND
CTS	8	4	7	5	RTS
DTR	9	6	6	20	DSR

Type 2: You can connect the RS-232 side of the A52/A53 to a DTE, such as a terminal or PC COM1/2, with 3-pin wiring if you don't need hardware flow control.

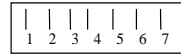|	A52/A53 RJ45	DTE Device DB25 Male	DTE Device DB9 Male	DCE Device DB25 Female	
TxD	5	3	2	2	RxD
RxD	6	2	3	3	TxD
GND	7	7	5	7	GND

RS-422/RS-485 Pinouts

The RS-422/RS-485 port with RJ45 connector or Terminal Block Connector is depicted as follows.

RJ45 Connector

1 2 3 4 5 6 7 8 9 10

Terminal Block Connector

1 2 3 4 5 6 7
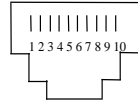
RS-422

Pin	RS-422 with RJ45	Pin	RS-422 with Terminal Block
1	TxD − (A)	1	TxD + (B)
2	RTS − (A)	2	TxD − (A)
3	RTS + (B)	3	RxD + (B)
4/7	SG	4	RxD − (A)
5	TxD + (B)	5	SG
6	RxD + (B)	6	Power GND
8	CTS + (B)	7	VCCA (9V)
9	CTS − (A)	---	---
10	RxD − (A)	---	---

> **NOTE** Pins 6 and 7 of the Terminal Block are for Power GND and Power Input, which can be used instead of a power adaptor. Be careful NOT TO confuse RS-422/RS-485 GND with Power GND.
> SG: Signal Ground

RS-485

Pin	RS-485 with RJ45	Pin	RS-485 with Terminal Block
1	Data − (A)	1	Data + (B)
4	SG	2	Data − (A)
5	Data + (B)	5	SG
7	SG	6	Power GND
---	---	7	VCCA 9 V
---	---	8	---

> **NOTE** Pins 6 and 7 of the Terminal Block are for Power GND and Power Input, which can be used instead of a power adaptor. Be careful NOT TO confuse RS-422/RS-485 GND with Power GND. SG: Signal Ground

⚠ CE WARNING

This is a Class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take appropriate measures.

Federal Communications Commission Statement

FCC - This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

⚠ FCC WARNING

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense..