

RS232 SERIAL DATA RECORDER

MODEL **RX**

- DUAL CHANNEL
- 2 GBYTE CAPACITY
- INSTANT CABLE TAP

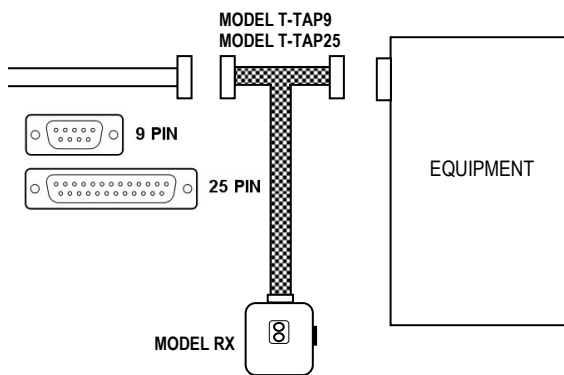
Model RX records serial data onto popular and inexpensive memory cards. The unit easily taps into existing serial data connections without interfering with the users system.

It's dual channel ability means that you can also record a second data line to capture TX and RX dialog between equipment. You may record all types of 7-8 Bit data such as text, photos graphics, proprietary protocols, .pdf files, photos, binary and non-ASCII types. Data is stored conveniently as a single RECORD.TXT file on the memory card.

No filtering and no conversion is performed on the data. Insert the memory card in a PC reader for quick transfer of all data to a PC folder. Many kinds of text data are immediately and reasonably viewable in spreadsheets or wordprocessors.



Tap into existing systems without interfering with its operation:



Scope of 2 Gigabyte capacity:

- You can record a constant stream of data at 9600Baud for approximately 24 days.
- You can record 1,000 byte bursts of data every 5 min. for 6,944 days.



Model T-TAP9 Accessory

FOR:

- Scientific Instruments
- Computers
- Machinery
- Modems
- Telecommunications
- Point Of Sale Systems
- Security Systems
- GPS Units
- PLC's
- Weigh Scales
- Sensors
- Printers

FEATURES:

- **No front panel settings or internal switches** - makes basic operation a simple procedure: just power up to enter record.
- **Dual channel setting** - uses two UARTS to enable recording of serial dialog between equipment.
- **2 GigaByte Capacity** - stores approximately 19 million lines of text data @100 characters/line.
- **T-Tap cable option** - allows quick and harmless tap into existing cables to record dialog between equipment.
- **No flow control required** - just RX and TX pins are read, RTS/CTS is not used, so all taps are simple, and non-interfering.
- **No software is used** - no licensing is involved and no learning or handling of software is required.
- **Data appends after power -up** - data stays in memory card until user erases it. Back to back projects can exist.
- **Recovers after power outage** - begins recording automatically, and appends data to where it left off. No operator required.
- **Audio Sound Transducer** - useful tones help confirm correct operation. Block data-writes to memory card sound similar to a disk drive.
- **Channel Number Stamp** - identifies the recorded data as send or receive when channel changes, ie. RX or TX.
- **"Memory Used" Level Indicator** -programmable threshold signals to the user by LED that memory level is exceeded.
- **Transient Voltage Protectors** -helps suppress damaging RS232 electrical spikes caused by environment, eg. static, lightning effects.

Model RX is recommended if you wish to record data in an established system but are concerned about disrupting it. You may feel that it is complicated and may need wiring changes and studying, however this is usually false. Simply install the T-Tap device where a serial cable connections exists, then you will be able to use the recorder without the system being affected by it. You can obtain background recording as a permanent or temporary function without affecting the users equipment. The recorder can be powered on or off, and the memory card can be installed/removed without the users system being affected. This is a valuable feature that makes recording in many types of systems easily accomplished.

Record for days, weeks or months depending on the application.

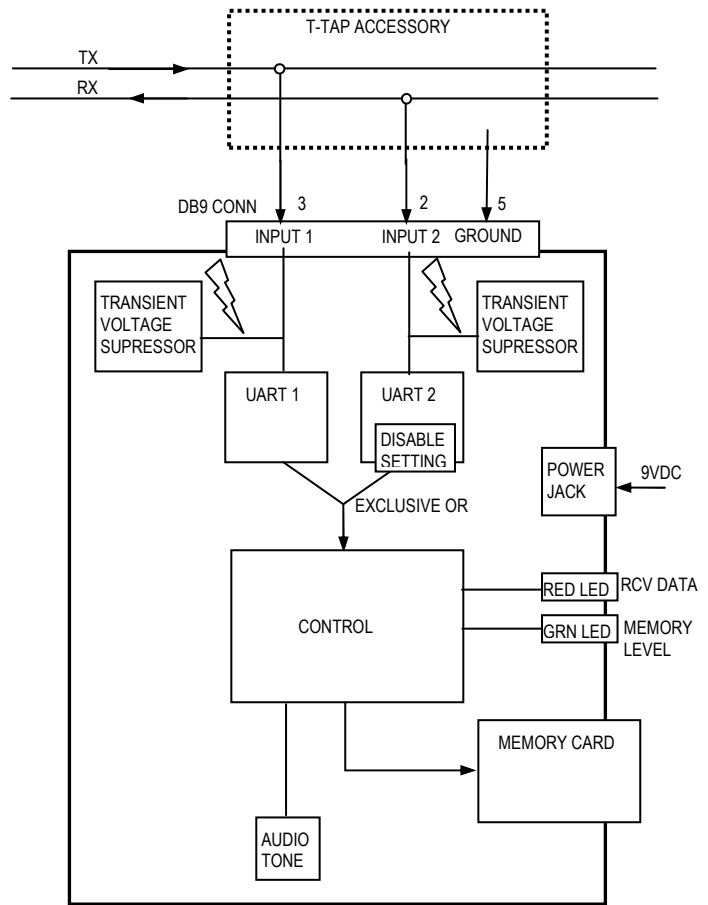


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SPECIFICATIONS

Interface	RS-232 DB9F Connector
Data Rates (Baud)	300, 600, 1200, 2400, 4800, 9600, 19.2K, 38.4K, 56.7K, 115.2K
Data Bits / Parity	8 Bits, No Parity, 7 Bits, Even Parity, 7 Bits, Odd Parity,
Time Stamp	None. Choose Model TG for timestamp feature.
Dual Channel	Enable or Disable setting. Channel1 = DB9 Pin 3 Channel2 = DB9 Pin 2 Half duplex operation records data channels in order received
Dual Channel Stamp	Text stamp "CR LF CHNx: CR LF " is inserted at the start of a channel change.
Memory Fill Level Indicator LED	Settable Levels: 100KB, 500KB, 1MB, 10MB, 100MB, 200MB, 500MB, 900MB
Handshaking RTS/CTS	None Required. Simplified interface uses Data + Ground only.
Power	DC Jack 5-18Volts 57ma 9 Volt DC Wallmount Adapter accessory.
Data Capacity	Approximately 2 Gigabyte
Memory Card	SanDisk Compatible SD (Original or Level2 Speed)
File Type	Windows PC Compatible FAT. 8 Bit Data File Name: RECORD.TXT
Front Panel Indicators	Red LED = Record Green LED = Memory Fill Threshold Status
Audio Sound Transducer	Generates feedback audio tones to help confirm operation.
Configuration	Performed by editing CONFIG.TXT file on memory card
PHYSICAL	
Weight	100 grams
Dimensions	6.5 cm x 6.5 cm x 2.8 cm
Enclosure	ABS Plastic

BLOCK DIAGRAM:



TO START RECORDING:

1. Power down
2. Install memory card:
 - Either 1. new card with no files on it.
 - 2. used card with only RECORD.TXT on it.
 - 3. card with only CONFIG.TXT on it.
3. Power up.
 - A new card will format and create empty RECORD.TXT (0 bytes).
 - A used card with RECORD.TXT on it will continue recording, appending where it left off.
 - A CONFIG.TXT card will load new settings to the recorder and store them in non-volatile memory.

On powering up, the LED indicators blink on, and a beep tones will be heard when recording mode is ready. Erased cards require about 3 seconds to format. If the card is defective, then the LED indicators will blink continuously, or will fail to create the beep tones.
4. When a double beep is heard, the unit is ready to record.
5. The red record LED will blink when a character is received at the interface.
6. After a block of 512 bytes have been received, a beep (tick) will be heard, indicating that the block wrote to the memory card successfully. The beep helps confirm proper operation of the recorder.

TO END RECORDING:

- ▶ Press the side panel Red Pushbutton.
- ▶ Listen for two audio beeps.
- ▶ Power down.
- ▶ The memory card may now be removed and read on a Windows PC.

ON POWER OUTAGE:

- ▶ The recorder design is meant to protect the recording by closing the file on the memory card when a power outage occurs.
- ▶ When power returns, the recorder should continue recording where it left off.

CONFIGURING MODEL TG

Make a **CONFIG.TXT** file to edit on a PC Note: **RECORD.TXT** file will be erased.



- Press pushbutton while powering up.
- Wait for audio tone to stop.
- Remove memory card and open **CONFIG.TXT** on a PC



CONFIG - Notepad

File Edit Format View Help

EDIT CURRENT SETTINGS: CONFIG.TXT

```

BAUD
0 300
0 600
0 1200
0 2400
0 4800
1 9600
0 19.2
0 38.4K
0 57.6K
0 115.2K
1 8 BITS, NO PARITY
0 7 BITS, EVEN PARITY
0 7 BITS, ODD PARITY

1 CHANNEL LABEL
1 TIMESTAMP AFTER 2 SEC RCV IDLE TIME
0 NOT USED
0 NOT USED
0 NOT USED

1 DUAL CHANNEL ENABLE (DB9 PINS 2,3 BOTH RCV)

MEMORY FILL LEVEL INDICATOR
0 100KB
1 500KB
0 1MB
0 10MB
0 100MB
0 200MB
0 500MB
0 900MB

CLOCK/CALENDAR
28 DAY
09 MONTH
09 YEAR
08 HOUR
27 MINUTE
0 SET CLOCK

OPTION
0 #1
0 #2
0 #3

* DO NOT CHANGE ANY SPACING OR FORMATING WHEN EDITING.
* PERFORM FILE SAVE TO CARD.
* RECORDER WILL DETECT CONFIG.TXT AND ADOPT SETTINGS
  INTO RECORDER NON-VOLATILE COMPUTER CHIP.
  
```

CAUTION
WHEN EDITING CONFIG.TXT
DO NOT CHANGE ANY SPACING
OR FORMATTING.

Set a baud rate. Edit to: "1"

CRLF **CHx**: CRLF precedes data after the channel has changed:

Not Used. Timestamp feature not available. Choose Model TG for this feature.

Front Panel green LED activates if memory card contains more that 500KBytes

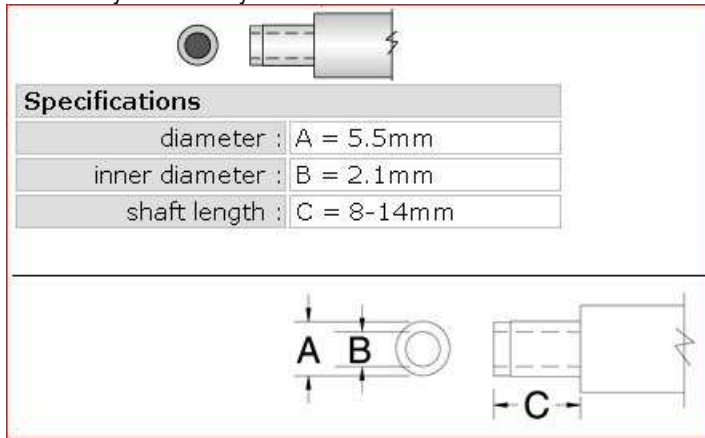
Not Used. Clock/Calendar feature not available. Choose Model TG for this feature.

Custom design options may be enabled.

- After editing, perform: **File Save**
- Install memory card in recorder and power up.
- The settings will transfer to non-volatile memory in the recorder.
- When the audio tones stop, the recorder will be ready in record mode.

POWER SUPPLY

- Commonly available style:



Typical Rating:
9 Volt DC, 200mA

Adapter should be approved: UL, cUL, VDE or approval of your country.



EXTERNAL BATTERY CABLE

PART: BATCAB



No internal battery is available for recording operation.

An External Battery Cable accessory is used to power the recorder from a variety of external batteries.

Voltage requirements 5V to 18V DC

Eg. 6 V Lantern batteries: Type 908, or Type 918



TYPE 918

Approximate Battery Life:

Battery Rating: 40,000 mah capacity.

Model RX current usage: 57 ma

Battery Life: $40,000/57\text{ma} = 700$ hours

Degrade by 30% = $700 - 30\% = 490$ hrs

Life: $490\text{ hrs}/24\text{ hrs} = 20$ days

TESTING MODEL RX

A simple connection to a PC may verify basic operation and familiarize useage.

Set to:
9600 Baud
Data Bits: 8
Parity: None
Stop Bits: 1

MODEL RX
Data will record as
Channel #1

Straight-Thru Extension Cable

The T-TAP9 Accessory Cable may also be used:



PC

DB9 COM PORT
Or use USB Serial
COM Port Adapter.

Open Windows Hyperterminal
Set Properties:
9600 Baud
Data Bits: 8
Parity: None
Stop Bits: 1
Flow Contol: None

Memory Card Specifications

Actually maximum capacity of 2 GB rating is approximately 1.9 GBytes

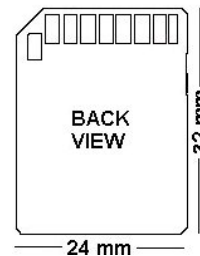
Popular Standard Original Type: SD

- Not MicroSD
- Not miniSD
- Not SDHC

Use 2GB or 4GB

Use SanDisk or compatible.

Level 1 or Level 2 speed cards.

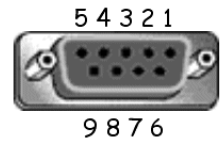


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DB9 CONNECTOR PINS: The interface is the mate to a PC COM Port (ie. connect to PC with straight-through cable extension).

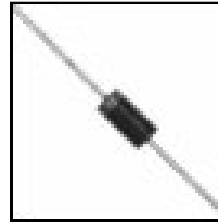
- | | | |
|---|--------------------|---|
| 1 | CONDITIONAL OUTPUT | Only acts as a +V pullup output for equipment which may require it. |
| 2 | INPUT RS-232 DATA | Channel 2 |
| 3 | INPUT RS-232 DATA | Channel 1 |
| 4 | NO CONNECTION | |
| 5 | SIGNAL GROUND | |
| 6 | CONDITIONAL OUTPUT | Only acts as a +V pullup output for equipment which may require it. |
| 7 | NO CONNECTION | |
| 8 | CONDITIONAL OUTPUT | Only acts as a +V pullup output for equipment which may require it. |
| 9 | NO CONNECTION | |



INTERFACE INPUT CIRCUIT PROTECTION

Each Data Input is protected by a Transient Voltage Suppressor (TVS).

Type: Littlefuse Part# P6KE13A 600 Watt Peak Pulse Power
TVS devices are ideal for the protection of I/O interfaces, and other vulnerable circuits used in telecom, computer, industrial applications. Protection includes voltage transients from lightning and transient voltage events. This protection helps prevent damage to the Model RX .



TVS Part# P6KE13A

The TVS suppresses interface overvoltages above 13 volts. It automatically resets when the overvoltage goes away, but absorbs much of the transient energy internally.

NOTES & TIPS

1. "No handshaking required" specification means only the data signal and ground pins need to be used. The recorder simply listens on the users serial cable and does not have to react to any protocols. This makes recording from users systems very easy. Only 2 wires are needed: Data and Ground.
2. Always listen for the power-up Beep . This assures you that the units basic function is working and Record Mode has been entered and is waiting for data to record.
3. To confirm proper operation while installed, listen for the beep tone when a block of data is being witten to the memory card. Every 512 bytes received will sound a short beep (tick) when it is finished being written to the memory card. The tick sound can be equated to the sound of a PC Hard Disk Drive writing data. Also, the Red LED will come on when data is being recorded.
4. If the recorder fails at making RECORD.TXT or CONFIGURE.TXT files, then it is possible that the card requires a format from the PC. (Go to reader drive letter used, eg. "F", right click and choose Format). The card may be defective.

PARALLEL INTERFACE RECORDING

To record print data from Parallel print cables rather than Serial you require Photologic Ltd. Model PDX-R
The interface is Centronics Parallel or IEEE-1284 Centronics

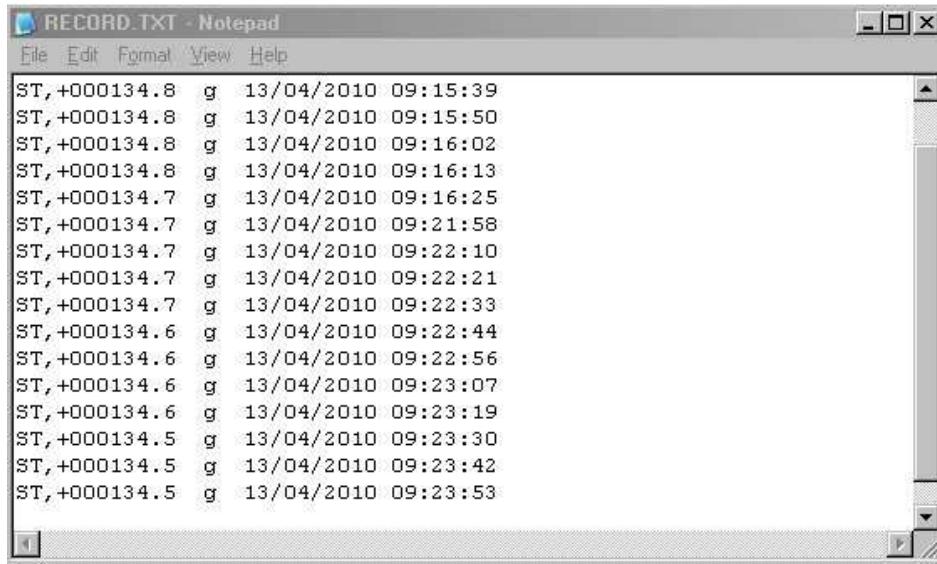
Identify parallel interface
by 36 Pin connector :



SAMPLE OF RECORDING:

Below is a sample of plain text data recorded from a balance scale instrument.

- The balance outputs a line of data every 10-12 seconds.
- As the balance output is plain text, the recording is easily viewed in text processors such as Windows Notepad, Wordpad or Word.
- Also since the text data values is columnar in nature, it would likely be able to open and be useable in a spreadsheet such as MS Excel.

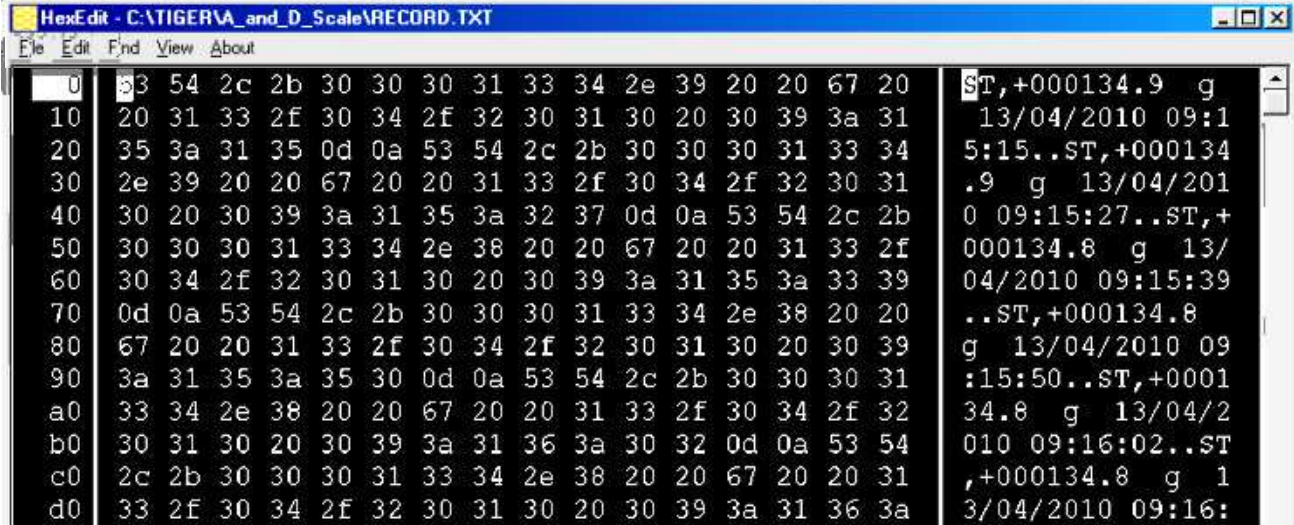


```
RECORD.TXT - Notepad
File Edit Format View Help
ST,+000134.8 g 13/04/2010 09:15:39
ST,+000134.8 g 13/04/2010 09:15:50
ST,+000134.8 g 13/04/2010 09:16:02
ST,+000134.8 g 13/04/2010 09:16:13
ST,+000134.7 g 13/04/2010 09:16:25
ST,+000134.7 g 13/04/2010 09:21:58
ST,+000134.7 g 13/04/2010 09:22:10
ST,+000134.7 g 13/04/2010 09:22:21
ST,+000134.7 g 13/04/2010 09:22:33
ST,+000134.6 g 13/04/2010 09:22:44
ST,+000134.6 g 13/04/2010 09:22:56
ST,+000134.6 g 13/04/2010 09:23:07
ST,+000134.6 g 13/04/2010 09:23:19
ST,+000134.5 g 13/04/2010 09:23:30
ST,+000134.5 g 13/04/2010 09:23:42
ST,+000134.5 g 13/04/2010 09:23:53
```

VIEWING INDIVIDUAL BYTES IN RECORD.TXT

Each byte in the RECORD.TXT file may displayed if you use a hex viewer such as free "HexEdit", available by internet search.

Below is HexEdit showing the contents of the balance scale data recorded above.



```
HexEdit - C:\TIGER\A_and_D_Scale\RECORD.TXT
File Edit Find View About
0  53 54 2c 2b 30 30 30 31 33 34 2e 39 20 20 67 20 ST,+000134.9 g
10 20 31 33 2f 30 34 2f 32 30 31 30 20 30 39 3a 31 13/04/2010 09:1
20 35 3a 31 35 0d 0a 53 54 2c 2b 30 30 30 31 33 34 5:15..ST,+000134
30 2e 39 20 20 67 20 20 31 33 2f 30 34 2f 32 30 31 .9 g 13/04/201
40 30 20 30 39 3a 31 35 3a 32 37 0d 0a 53 54 2c 2b 0 09:15:27..ST,+
50 30 30 30 31 33 34 2e 38 20 20 67 20 20 31 33 2f 000134.8 g 13/
60 30 34 2f 32 30 31 30 20 30 39 3a 31 35 3a 33 39 04/2010 09:15:39
70 0d 0a 53 54 2c 2b 30 30 30 31 33 34 2e 38 20 20 ..ST,+000134.8
80 67 20 20 31 33 2f 30 34 2f 32 30 31 30 20 30 39 g 13/04/2010 09
90 3a 31 35 3a 35 30 0d 0a 53 54 2c 2b 30 30 30 31 :15:50..ST,+0001
a0 33 34 2e 38 20 20 67 20 20 31 33 2f 30 34 2f 32 34.8 g 13/04/2
b0 30 31 30 20 30 39 3a 31 36 3a 30 32 0d 0a 53 54 010 09:16:02..ST
c0 2c 2b 30 30 30 31 33 34 2e 38 20 20 67 20 20 31 ,+000134.8 g 1
d0 33 2f 30 34 2f 32 30 31 30 20 30 39 3a 31 36 3a 3/04/2010 09:16:
```

VIEWING OTHER FORMS OF DATA:

The recorder does not alter the captured data, so the user may record any kind of data stream that uses 8 bit wide data bytes.

That may include photos, TCP/IP data streams from modems, graphics from imaging instruments, and outputs from bar code and card readers.

If the data is not plain generic text, for example PCL emulation print data, then PCL viewers may be applied to the file. Such a viewer could be "VeryPDF" which converts a PCL code file to .pdf. Other print data files with emulations for printers Epsom, Okidata, Proprinter, ESC-P may be viewed by other file converters found through internet search. Also, users may apply programming such as Visual Basic to parse data out of the file and manage it for specific use.

PART# T-TAP9

CABLE ACCESSORY FOR MODEL RX SERIAL DATA RECORDER



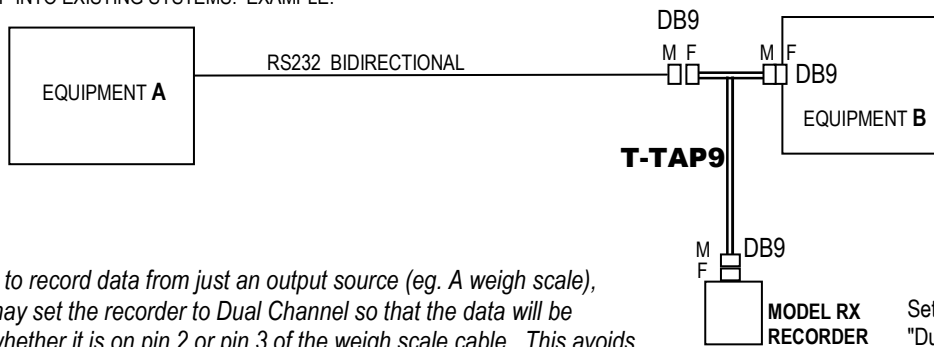
Use to tap into a DB9 cable connection in a system and record RX and TX in the background.

Example applications:

- modems
- lab instruments
- PLC's
- machines
- Point Of Sale systems
- printers
- card readers
- telecommunications

- ▶ No extra wiring required, - "just plug in".
- ▶ No handshaking required.
- ▶ Recording does not interfere with users system.
- ▶ Recorder may be disconnected/connected, or powered on/off, or memory card removed/installed without interfering with users system.

INSTANTLY TAP INTO EXISTING SYSTEMS. EXAMPLE:



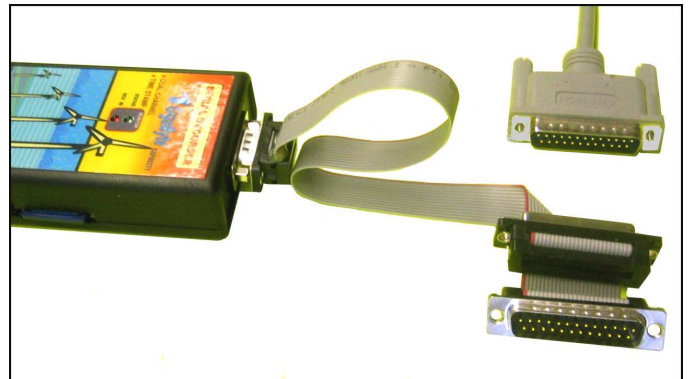
If you wish to record data from just an output source (eg. A weigh scale), then you may set the recorder to Dual Channel so that the data will be recorded whether it is on pin 2 or pin 3 of the weigh scale cable. This avoids rewiring cables due to pin reversal confusion.

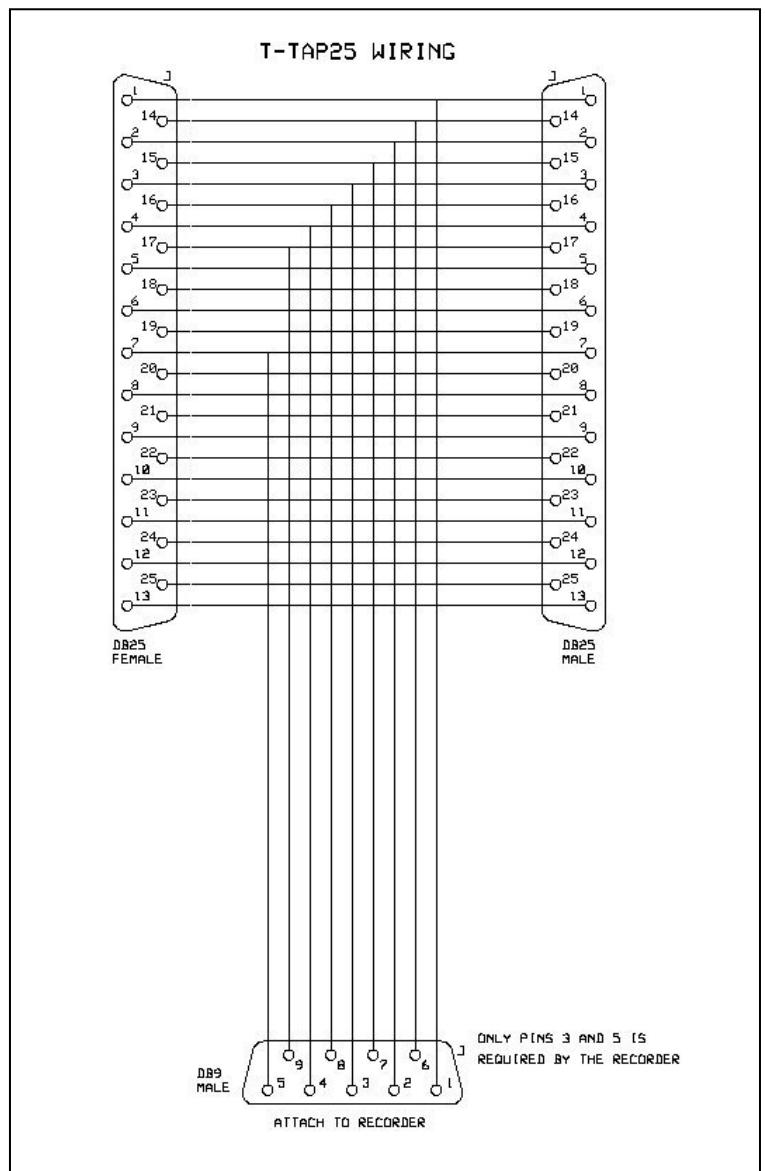
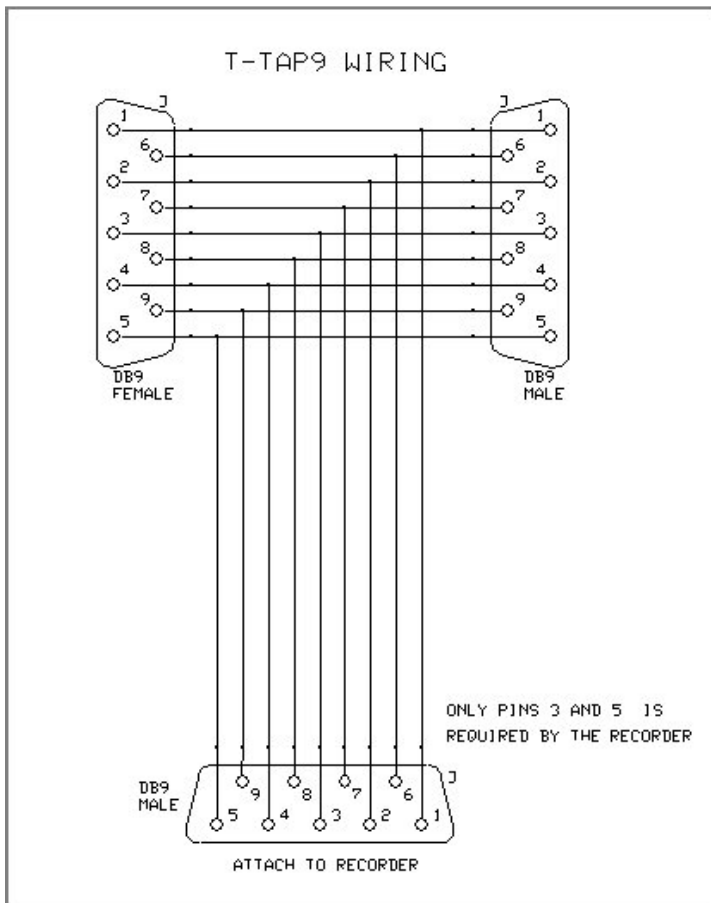
Set Model RX to "Dual Channel" to record dialog.

PART# T-TAP25

CABLE ACCESSORY FOR MODEL RX SERIAL DATA RECORDER

Use similar to T-TAP9 above except the use is for tapping into a DB25 cable connection.





TO CONNECT DIRECTLY TO EQUIPMENT SERIAL PORT OR CABLE:

USER EQUIPMENT
Eg. Alarm System

DB9
or
DB25



NUL CONNECTOR
IF REQUIRED

9 WIRE OR 25 WIRE CABLE
OR NUL CABLE



DB25 TO DB9
IF REQUIRED



As connector styles and pinning vary on user equipment, a combination of DB9-DB25 adapter, NUL Connector and Gender Changer with a 9 wire or 25 wire cable should be all that is required. The Model RX supplies steady state flow control and supervisory signals to the users equipment if they are required, so there should be no special jumpering/soldering pins to a cable. The Model RX only requires data and ground pins to work. If data is on the wrong pin, (eg. Pin 2 versus Pin 3), then the user can use a NUL connector or NUL cable, or enable DUAL CHANNEL on the recorder which logs both Pin 2 and Pin 3.

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DOCUMENT: RX.PDF REV.2 NOV.2011

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