RS232 SERIAL DATA RECORDER

MODEL TG

- DUAL CHANNEL
- TIMESTAMP
- 2 GBYTE CAPACITY
- INSTANT CABLE TAP

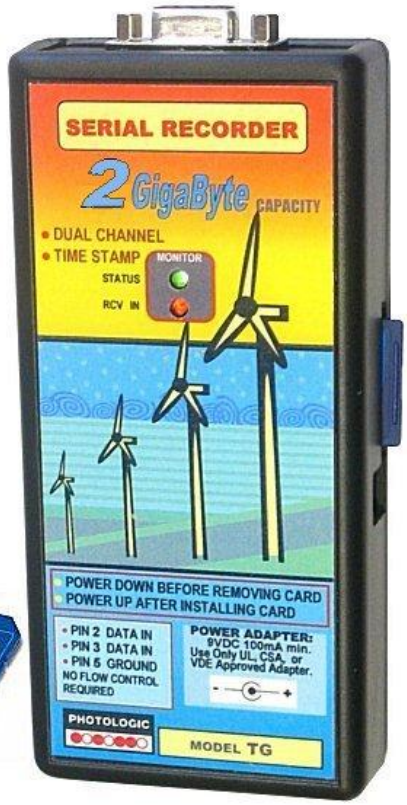
Model TG records serial data onto popular and inexpensive memory cards. The unit easily taps into existing serial data connections without interfering with the users system.

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.

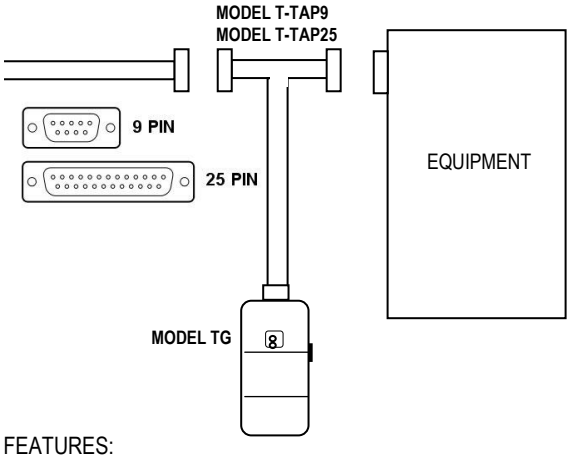
FOR:

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



Model TG

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

FEATURES:

- **No front panel settings or internal switches** - makes basic operation a simple procedure: just power up to enter record.
- **Timestamp setting** - can mark bursts of data that are received periodically.
- **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.
- **Microcontroller & UARTs are "plug-in"** - socketed parts makes the unit user repairable, to help protect the investment.
- **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 supress damaging RS232 electrical spikes caused by environment, eg. static, lightning effects.

Model TG 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 usually redundant. 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 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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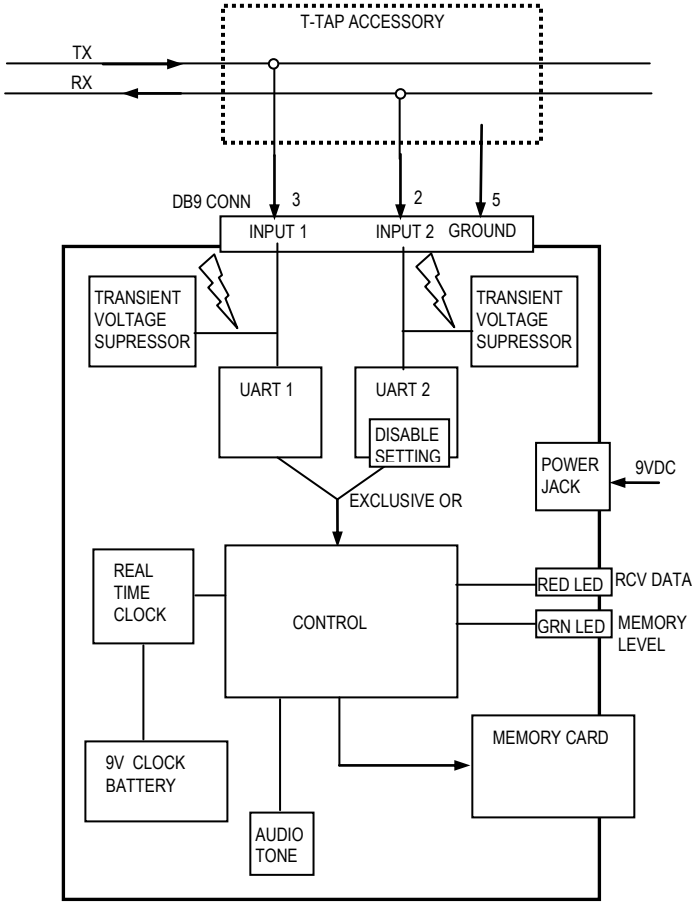
SPECIFICATIONS

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	Enable or Disable Timestamp after 2 seconds idle time Format: CR LF dd/mm/yyyy hh:mm:ss CR LF
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 Bytes: 100KB, 500KB, 1MB, 10MB, 100MB, 200MB, 500MB, 900MB
Handshaking RTS/CTS	None Required Uses Data + Ground only.
Power	DC Jack 5-18Volts 57ma 9 Volt DC Wallmount Adapter supplied
Clock Battery	Internal 9Volt battery. Accessible from battery hatch door. Life: >2 Years
Data Capacity	Approximately 2 Gigabyte
Memory Card	SanDisk Compatible SD
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 tones to help confirm operation.
Configuation	Performed by editing CONFIG.TXT file on memory card
PHYSICAL	
Weight	125 grams
Dimensions	5.75" L x 2.75" W x 1.1" H (14.5 cm x 7 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:

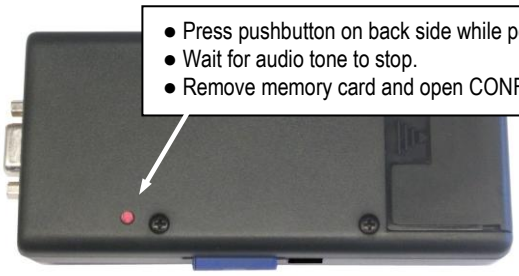
- ► Press the back panel Red Pushbutton.
- ► Listen for two audio beeps.
- ► Power down.
- ► The memory card may now be removed and read on a Windows PC.

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

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

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.
```

Set a baud rate. Edit to: "1"

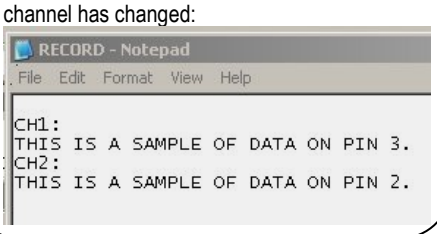
Front Panel green LED activates if memory card contains more that 500KBytes

Shows current time. Military format - Edit to adjust.

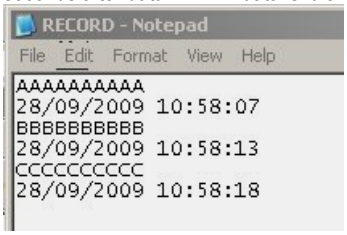
Set to "1" to adjust

Custom design options may be enabled.

CR LF **CHx:** CR LF preceeds data after the channel has changed:



Example: Timestamp triggers 2 seconds after data AAAAA data is idle:

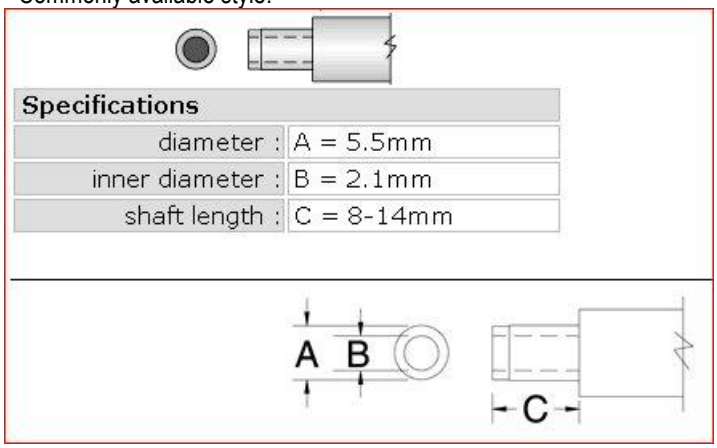


Timestamp only applies to Channel #1
2 SEC value is not editable.

- 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, Type 918

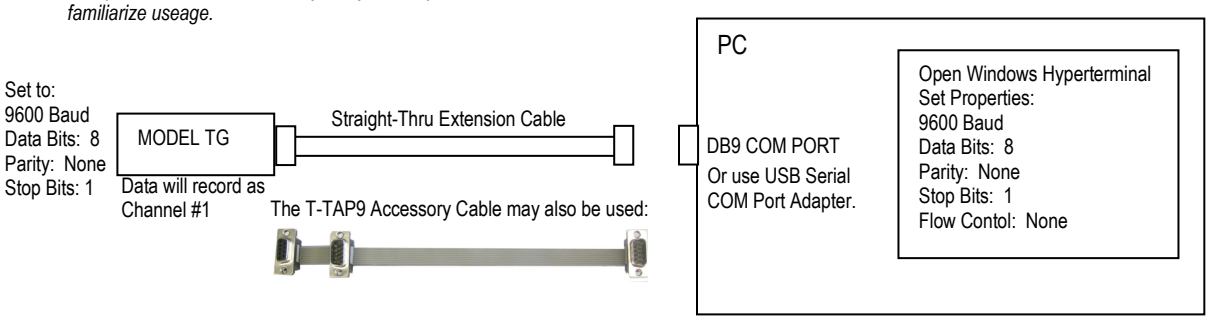
TYPE 918

Approximate Battery Life:
Battery Rating: 40,000 mah capacity.
Model TG Usage: 57 ma
Battery Life: 40,000/57ma = 700 hours
Degrade by 30% = 700 - 30% = 490 hrs

Life: 490 hrs/24 hrs = 20 days

TESTING MODEL TG

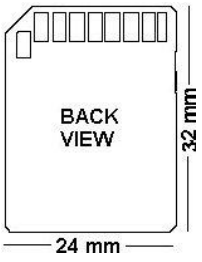
A simple connection to a PC may verify basic operation and familiarize useage.



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.



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	

ABOUT CLOCK CALENDAR

Format : dd/mm/yyyy hh:mm:ss Example for December 25, 2010 1:55PM: **25/12/2010 13:55:00**
Default Time due to unset clock or disabled 9Volt battery displays: **01/01/2001 01:01:00**
Total number of bytes in string: 24 bytes including CR, LF bytes at beginning and end of string.
The timestamp only applies to Channel #1 Reverse DB9 Pins 2 & 3 on input cable to timestamp alternative data line.
If Timestamp is enabled, but the Battery is disabled, then erroneous date values will exist. Solution: Disable Timestamp

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. You can check the recorder clock/calendar time by making a CONFIG.TXT file on the memory card.
   (Press pushbutton on backside while powering up.) Read the card on a PC to view the time. When the card is installed back into the recorder, the recorder will format the card to contain an empty RECORD.TXT file.

5. 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.

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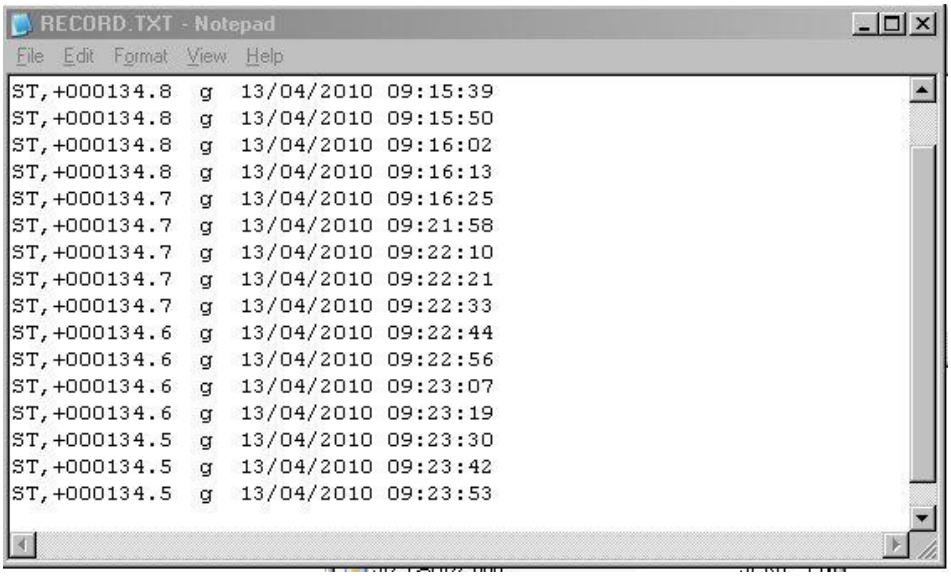
SAMPLE OF RECORDING:

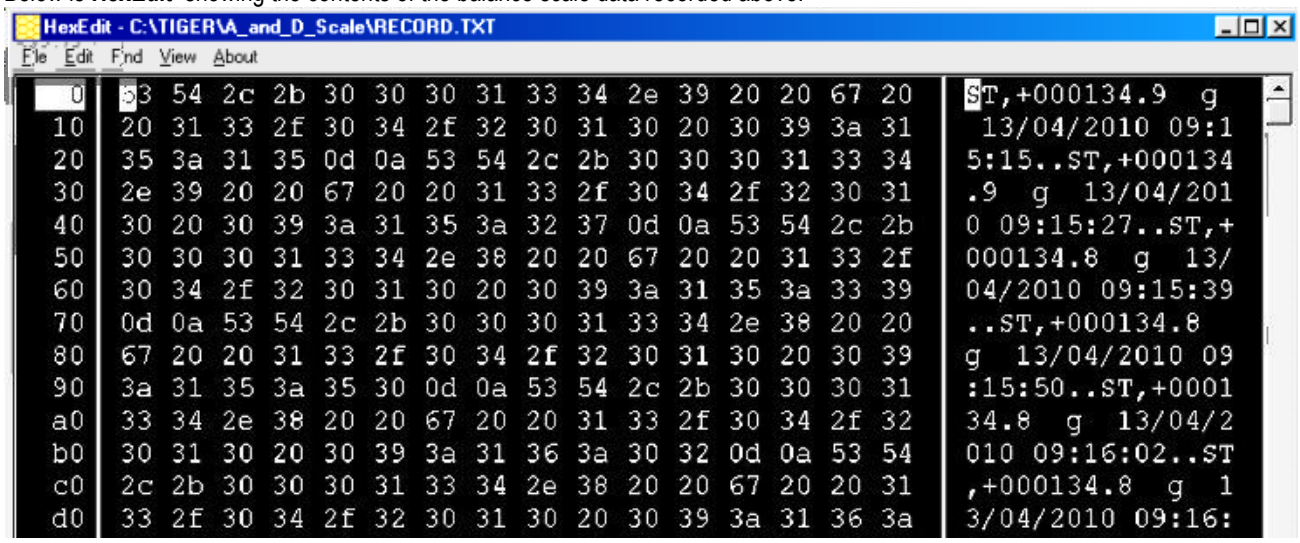
Below is a sample of plain text data recorded from a balance scale instrument.

- 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.



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.



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 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 TG SERIAL DATA RECORDER

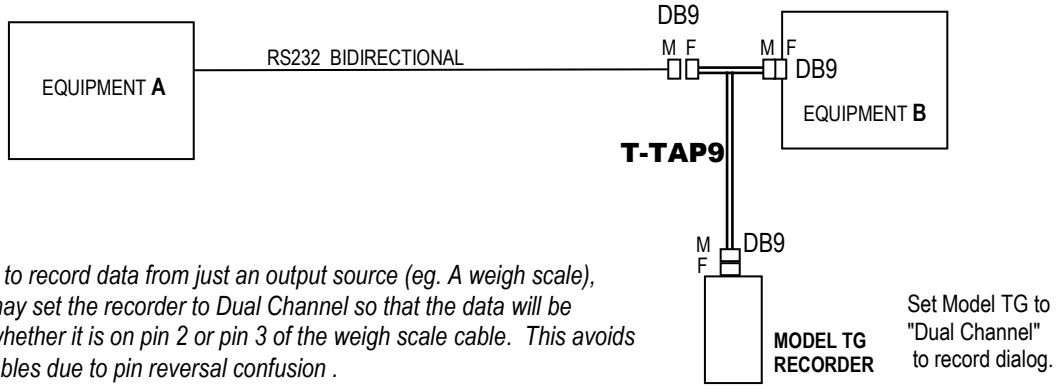
Use to tap into a DB9 cable connection in a system and record RX and TX in the background.

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:



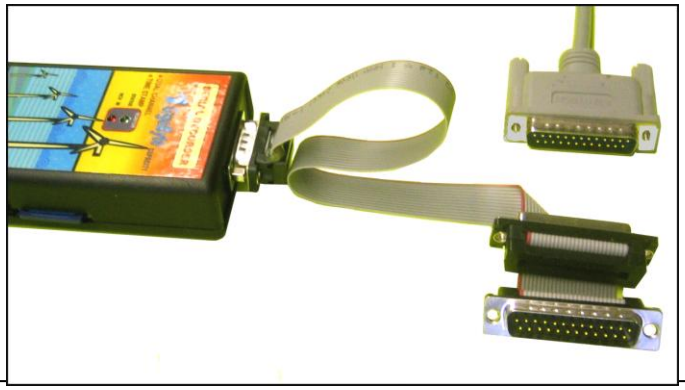
If you wish to record data from just an output source (eg. A weigh scale), then you may set the recorder to Dual Channel so that the data will be recorded whether it is on pin 2 or pin 3 of the weigh scale cable. This avoids rewiring cables due to pin reversal confusion .

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

PART# T-TAP25

CABLE ACCESSORY FOR MODEL TG SERIAL DATA RECORDER

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



TTAP.DOC

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