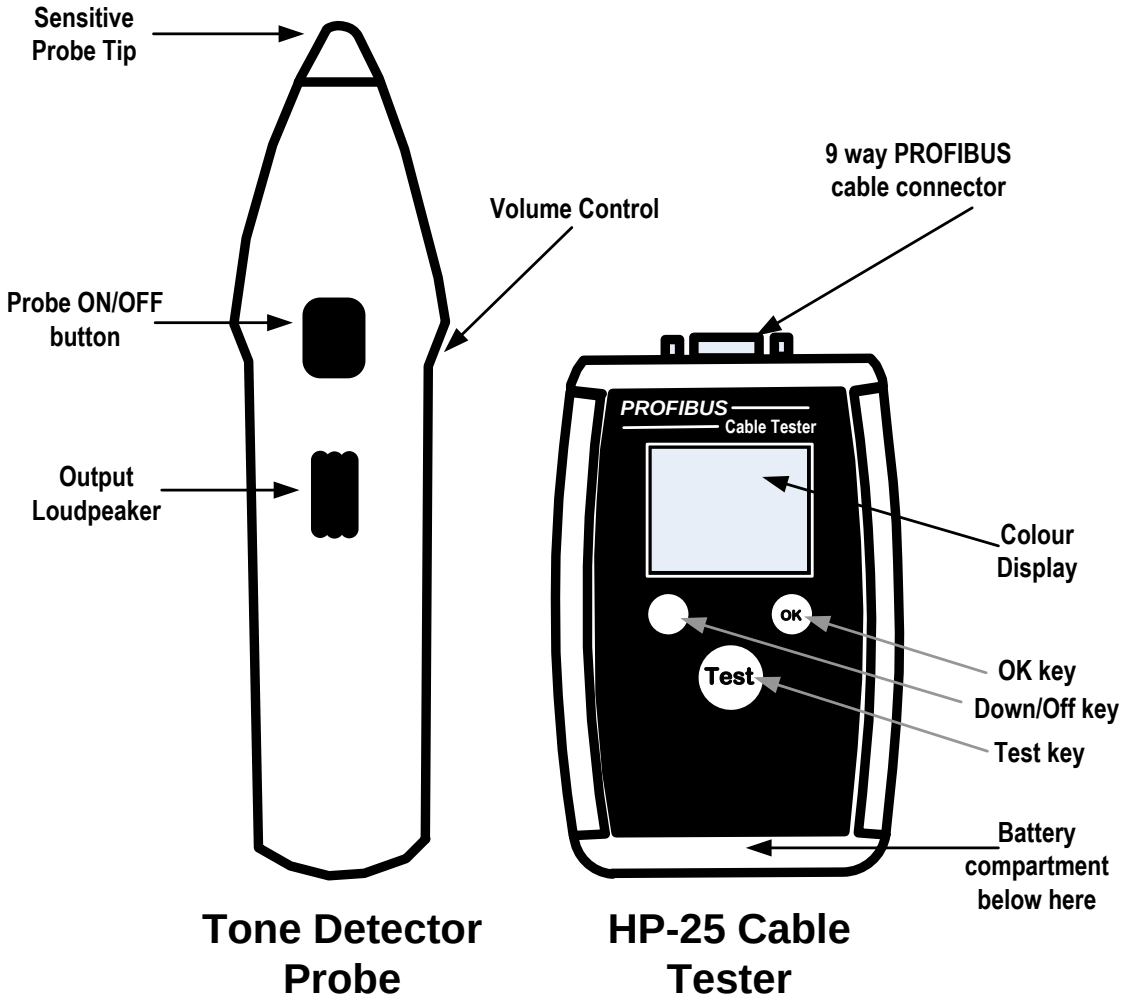
Hi-Port HP-25 PROFIBUS Cable Tester

Operating Instructions



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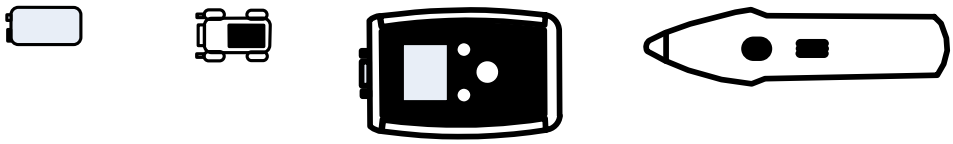
Hi-Port HP-25 PROFIBUS Cable Tester : Quick Start Guide

1 Essential Kit : battery test plug HP-25 tester optional : tone probe



2 What does it do : Checks connections between pairs of 9 pin PROFIBUS DP connectors.

With tone probe, identifies IN and OUT cables at remote location.

3 What does it report : **Correct connections** : shows Test Pass with number of terminators

Faults : shows Test Fail with details of open lines, short circuits, cross connection between A and B conductors and otherwise correct connections but with more than 2 terminators. Also reports if connected cable is live, with voltage from a slave or active terminator.

4 Operating Modes :
Normal test mode : menu prompted access to tests and settings
Fast test mode : starts immediately ready for new connection test
Tone test mode : for identification of remote IN and OUT wires
Result demo mode : shows all test pass and test fail messages
Settings : show / change display setup and unit run time values

5 Getting started : Open underside battery compartment. Fit 9 volt battery to terminal lead, then carefully locate battery within compartment, inserting terminal end first.

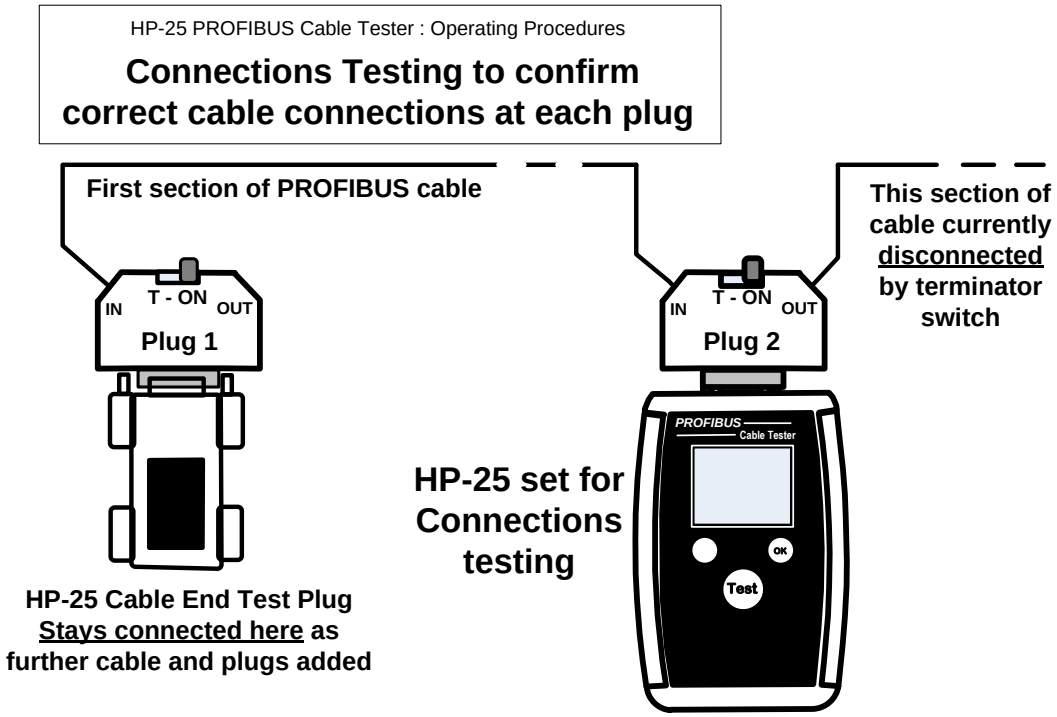
Ensure that connecting wires are arranged to run down side of battery – care is needed here in order to allow sliding hatch to be closed easily and released later to change battery.

6 Switch-ON : Press and hold central **Test key** until you hear a bleep from unit – then release Test key. After initial identification screen, the **tests menu** will usually be shown – use indicated **Down** and **Up** keys to move highlight, then right **OK key** to start selected function.

If the unit had previously been set to **Fast test mode**, display will show **Ready to Test** after first identification display – in this case, use the Test key to start testing a connected cable.

7 Switch-OFF : **Off** function is prompted to left side key in all test result reports.
Alternatively the unit will automatically switch off after the user selected **Run Time**. This is initially set for 4 minutes, but may subsequently be changed in 4 minutes steps up to maximum of 20 minutes. Once changed, the new value will be used each time the tester is started, until explicitly changed again using the **Settings dialogue**.

8 Connection Test Procedure : Fit and secure **end test plug** to the start of cable to be tested. Fit HP-25 tester to far end plug, if necessary with local plug terminator switch turned ON to isolate that first section of cable from ongoing sections. Switch-on the HP-25, select **Connections** line from **tests menu** by pressing the right hand OK key (when that line is highlighted). When **Ready to Test** message is seen, press the central **Test** key to start the cable test.

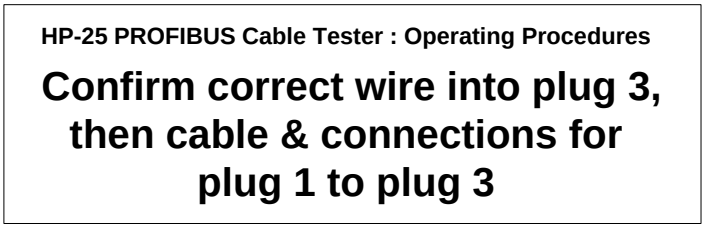


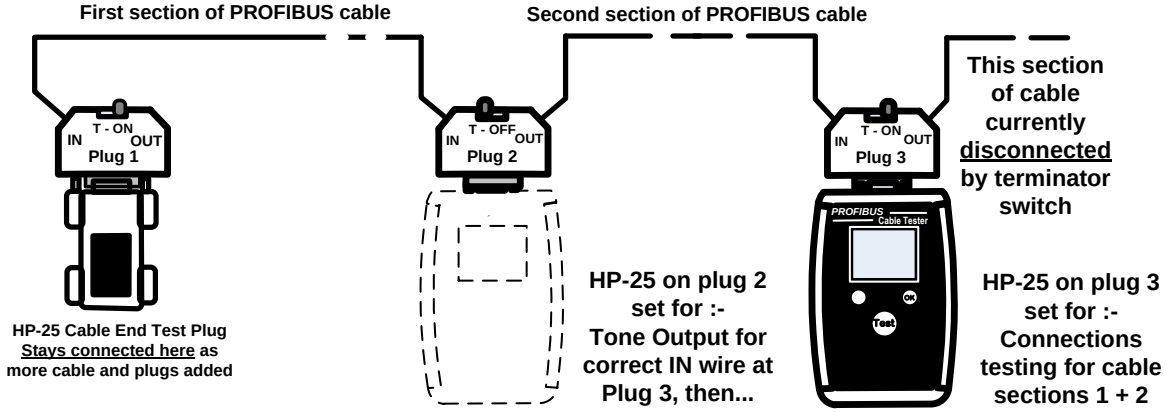
Test results will be reported by sound signal, with details shown on the colour display. Correct cable reports will include the number of terminators detected. If more than 2 terminators are found in an otherwise correctly connected cable, this will be reported as a failed test result. Different sound signals are used to emphasise fault reports, with details of the fault shown on the display with colour coding of associated conductors. **Green** is used to indicated the A conductor, **Red** for the B conductor and **Black** for the cable screen/shield.

Note that the first section of PROFIBUS cable MUST be fitted into the IN port of plug 1, as terminator switch will (operationally) need to be set ON and will then disconnect any cable on the OUT port.

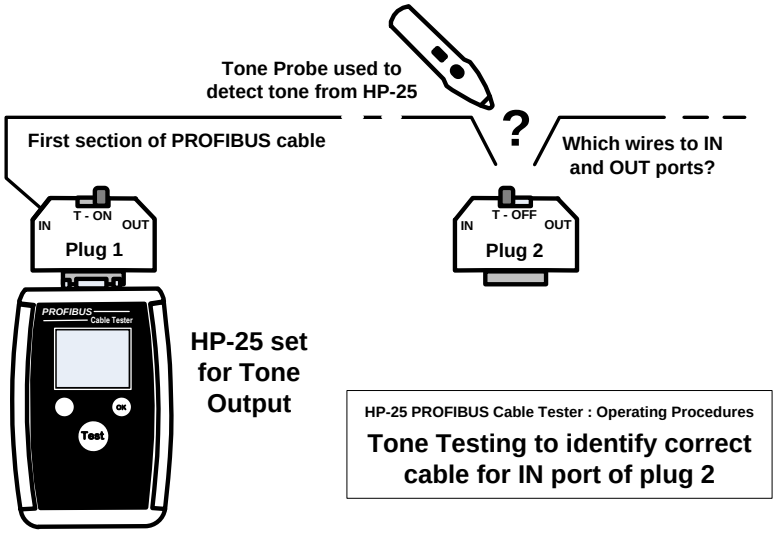
At the end of each test, the Test key may be used to repeat or start a new test. Alternatively the left key may be used to turn off the tester. The right hand OK key may be used to brighten the display after it has automatically dimmed (to save battery power).

9 Multi-drop cable testing : Check the first cable section as above, then disconnect the HP-25 tester, clearing the terminator switch on that PROFIBUS connector. Move down cable to the next connector location, setting the terminator switch at that point, connecting HP-25 tester onto that plug. Press the Test key to here test the **first two sections** of cable, back to the test plug fitted at start of cable. Repeat this procedure, adding and testing successive lengths of cable one at a time, until the complete end to end run has been tested and confirmed as correctly assembled, with no more than 2 terminators set over the whole length.





10 Tone Testing : When **Tone Output** is selected from the **Tests menu**, the HP-25 begins output of an intermittent tone signal onto the PROFIBUS **A line** (green core). This may be used, at a remote location, with a tone detector probe, to identify which of a pair of cables should be connected into the **IN** port of a new PROFIBUS connector.



Correct orientation of cables within all plugs is important, as the **outgoing cable will be disconnected** when the terminator switch is set ON at that plug – this is a very useful feature for both **commissioning** a new network and also for later **fault-finding,** as it enables network partitioning for testing.

Tone Output is confirmed with a green background display on the HP-25, initially with the **default 4 minute run time shown**. This period may be extended in 4 minute steps up to a maximum of 20 minutes using the prompted middle **+4 min** key. During tests, the remaining test time will be

indicated on the display in minutes, updating at end of each minute. Note that this will **show zero** for the final minute! Tone tests may be ended early using the left hand **Off** key or right **OK** key.

Apply the **Tone Probe** end tip to the HP-25 cable connector or outgoing cable end, press the **ON/ OFF button**, if necessary adjusting side **volume control** to hear intermittent signal from the HP-25.

11 Display brightness : The display brightness and other related parameters may be adjusted using the **Settings dialogue**. New values are then saved for later test sessions.

It is recommended that **display brightness be minimised** in order to conserve battery power and, much like most mobile phones, this is helped by automatic display dimming after a short (but adjustable) period. Similarly, the display dim level, can also be adjusted. Three different display settings may be so controlled, namely **Display Brightness**, **Bright Time** and **Dim Level**. Each such setting has 5 available setting levels with, for example, Bright Time adjustable over the range from 2 to 10 seconds (shown as setting values 1 to 5).

Currently saved setting values will be shown on the display when the Setting dialogue is run, then allowing each such value to be retained or changed. Currently displayed values are saved when the **OK** key is pressed to complete each setting, then storing any new value for use when the tester is next used.

Note that different brightness settings may be needed for using the tester in daylight or artificial lighting – similarly different dim levels may be preferred for each. The bright time setting range should allow time for easy reference to displayed test result details, although often the sound signal is sufficient to give first indication of test successes or failures. When display dims, use right hand **OK** key to see test result details again

12 Run time : The Settings dialogue, as mostly covered in the preceding section, is completed by the final **runtime setup sequence**. This allows adjustment of the HP-25 run time after the last key has been pressed, ie sets the automatic turn-off delay.

This is set to 4 minutes in a new tester, but may be increased in 4 minute steps, up to a maximum of 20 minutes, using the left hand and central keys, which are prompted for **Down** and **+4 mins** respectively. Once a new setting has been confirmed using the right hand **OK** key, that setting will be saved and used for all future use of the tester until explicitly changed again.

13 Fast test mode : Fast test mode enables quick access to **connection tests**, immediately after unit switch-on. Following notes explain how to engage and clear.

If not already operating, this mode may be started by pressing and holding down the right **OK key** immediately after release of the **Test key** to start the unit, up until the display first brightens. After a further short period the tester will give a double bleep and show the Ready to Test message, from which a new connection test may be started using the middle **Test key.**

Once selected, this Fast Test Mode will automatically operate each time the tester is turned on.

In order to return to normal (menu) mode, repeat the above turn on procedure, once more pressing and holding the right OK key again until the display brightens. This will clear the previous Fast Test Mode and allow access to the Tone Test and Settings dialogues.

14 Result demo mode : Result demo mode shows all of normally seen **test pass** and **test fail** report messages for user training and sales demos.

Result demo mode is started in a similar manner to that explained above for starting Fast Test Mode, but here pressing and holding the left hand **Down** key from immediately after the **Test** key is released up until display first brightens, during unit start-up. This result demo mode may only be engaged when the tester has not previously been set into fast test mode!

Once engaged, use the central **Test** key to step through all available messages, finally using the prompted left **Off** key to end the sequence. Unlike the fast test mode, the result demo mode will not repeat automatically when the HP-25 is next turned-on.

15 Settings Dialogue : The Settings dialogue enables user adjustment of **display brightness**, **bright time**, **dim level** and unit **run time**.

The setting dialogue may be accessed from the initial Tests Menu page, by moving the blue highlight down to the final **Settings** menu line, before pressing the right hand **OK** key.

The program then runs through 4 separate sequences, each allowing adjustment and saving of a separate setting. Each sequence shows the associated setting name, shows the range of possible values, shows the current value, then shows what each of the 3 available keys will do.

Five different setting levels are available for each of the 4 dialogues. In the case of the **Brightness** adjustment sequence, the display will briefly change to a selected new brightness, after any change. When the **Bright time** is changed, this will be shown soon after by dimming the display after the newly selected bright time. Newly selected **Dim levels** may be seen after the current bright time.

Finally, the **Runtime setup** sequence allows adjustment of the automatic turn-off delay for the tester. Initially this is set to 4 minutes in a new tester, but may be changed later in steps of +4 minutes up to a maximum of 20 minutes using prompted keys. On completion of the runtime setup sequence control returns to the Tests Menu once again. All 4 setting screens are automatically run one after the other, with the prompted OK key completing each such sequence, saving any new values, then moving on to the next sequence, finally returning to the tests menu. A user can safely run through all such sequences using the right hand OK key in order to check on current setting values, without changing any.

16 Other issues :

16.1 The HP-25 Cable End Test plug, once fitted to the first plug of a network, should remain there as new sections of cable and new plugs are fitted and connection accuracy confirmed, so enabling eventual end-to-end testing of the completed cable assembly.

16.2 Where a slave <u>is not connected using 9-pin connectors</u>, consider leaving PROFIBUS cable temporarily un-cut at that device location to enable immediate cable and connection verification testing, alternatively use temporary electrical screw terminal blocks or temporary PROFIBUS DB9 connector to join free cable ends, so allowing ongoing multi-drop cable testing.

Where slave device uses <u>M12 connectors</u>, use the Procentec DB9-M12 Tap Lead (with part no. 101-00052B – as in photo) or similar. The Procentec assembly includes both male and female M12 connectors and allows connection onto the HP-25 tester. Note that the two short M12 connection leads are joined within the 9-pin connector – ie the terminator switch cannot be used here to isolate test signals from outgoing cable.

16.3 When installing or commissioning new PROFIBUS cables, it is often worth checking cable length metre marks which are printed by the cable manufacturer (see photo).

These enable simple calculation and logging of cable lengths between plugs, but also allow checking that the cable has not been (maybe badly) joined between plug sites!