

**AUTO TRACKING TOTAL STATION**

# AP-L1A



# Speedy. Versatile and Accurate On



Topcon has developed the ultimate one-person survey system. The "Auto-tracking" total station AP-L1A, used in conjunction with radio communication, a hand held data collector and TDS Survey Pro Software produces a unique surveying system that enables all field surveying tasks to be carried out by one surveyor working on their own.

Complete control of the total station is given over to the rod-person who is with the prism and at the right place to make decisions about the surveying task being undertaken.

The outstanding capabilities of the AP-L1A ensure an easy to use system that can achieve optimum speed, versatility and accuracy when used by one person.



# e Person Survey



Driven by servo motors the AP-L1A has the ability to automatically search and lock on to the prism and an auto-tracking function to follow the prism even when

moved erratically or at high speeds. Standard EDM prisms can be used with the AP-L1A, or for even easier one-person operation, the new Topcon 360° prism unit A3S, ensures tracking lock is maintained from all directions.



The remote control unit is compact and lightweight and allows two way communication between the AP-L1A and the surveyor, giving real-time position, measurement data, and robotic control of the AP-L1A, to the surveyor.



All in all, a remarkable solution for a wide range of surveying and measurement tasks.

## FEATURES

### HIGH SPEED TRACKING

AP-L1A is designed to rotate and track at high speeds. This ensures that for normal surveying work the AP-L1A can easily follow the prism, even at shorter ranges.



High speed tracking (10°/sec.) also opens up a wide range of specialized applications. Aircraft flight tracking, hydrographic survey, machine control, etc.

### AXES FOR SIGHTING, DISTANCE MEASUREMENT AND TRACKING ARE COAXIAL

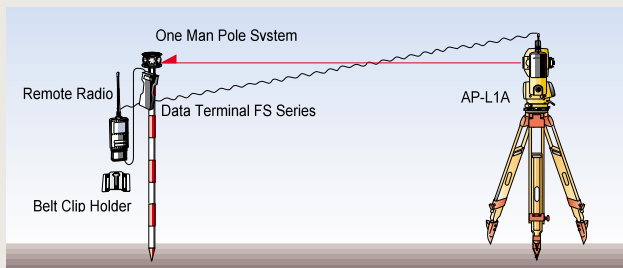


The world's first 3 axes coaxial mechanism provides high accuracy, simplicity of use and compact body design.

## ONE PERSON SURV

### ONE PERSON SURVEYING SYSTEM

The one person surveying system is made possible by the auto tracking function and the radio communication. This produces a new method of surveying which eliminates the need for manual aiming at the prism. This results in less mistakes and a major increase in efficiency.



### HORIZONTAL AND VERTICAL SEARCH ABILITY

Due to the horizontal and vertical searching ability of the AP-L1A, the prism can be found and tracked automatically. Search time can be reduced by defining a search area in the AP-L1A or by using the remote control to direct the telescope to the required location either by a specified angle rotation, a movement from the last position or a rectangular coordinate. Once close to the prism, the automatic search routine will begin and the AP-L1A will quickly lock on to the prism.

## RS-232C CONNECTOR



The data terminal and telemetry terminal with serial signal interface connectors are installed for direct connection of AP-L1A to external PC or for installation of radio data modems.

## KEYBOARD & DISPLAY



The wide dot matrix LCD (16 characters × 4 lines) offers clear visibility of measurement data. Special measurement functions are operated easily from the keyboard with the interactive menu.

## IMPROVED MEASUREMENT SPECIFICATIONS

- Extended measurement and tracking range up to 1 km.
- High accuracy angle measurement of 2" (6cc) for tra-

verse measurement with pointing accuracy of 3" (10cc) when in auto tracking mode. Minimum angle display is 1" (2cc)

## TRACKING LIGHT

The red LED shows the direction of aiming for stake-out surveying and aids one person surveying by indicating the tracking status of the AP-L1A.



| FUNCTION KEY   | MENU   |
|--|--|
| <ul style="list-style-type: none"> <li>■ Automatic rotation for leveling</li> <li>■ Measurement mode (mm/cm)</li> <li>■ Input of Back sight point coordinates</li> <li>■ Input of Instrument point coordinates</li> <li>■ Resection Calculation</li> </ul> | <ul style="list-style-type: none"> <li>■ Measurement of pre-measured points</li> <li>■ Determination of measuring areas</li> <li>■ Setting-out</li> <li>■ Tracking parameters</li> <li>■ Communication parameters</li> <li>■ Key-lock function</li> <li>■ Password function</li> </ul> |

# LEVELING SYSTEM

## LESS CHANCE OF MISTAKES

With the AP-L1A, the surveyor is put where he belongs: at the prism point, controlling and assuring his survey. Not only increasing efficiency, but also reducing the chance of mistakes and confusion that can result due to long distance communication or communication on busy construction sites.

## FLEXIBILITY

AP-L1A offers the user complete flexibility. Either Topcon Accessories can be used or any other available on the market.

## PRISM UNIT A3S

With the prism unit A3S, it is not necessary to constantly consider the direction in which the prism is facing. The specially designed prism unit A3S will be followed by AP-L1A from all directions. A3S prism unit can be attached on top of a conventional prism pole and has a zero prism constant.



## FS SERIES DATA COLLECTOR WITH TDS SOFTWARE

Through the handheld terminal, connected to the remote radio link, the surveyor can control the AP-L1A and use the extensive software for all surveying tasks.

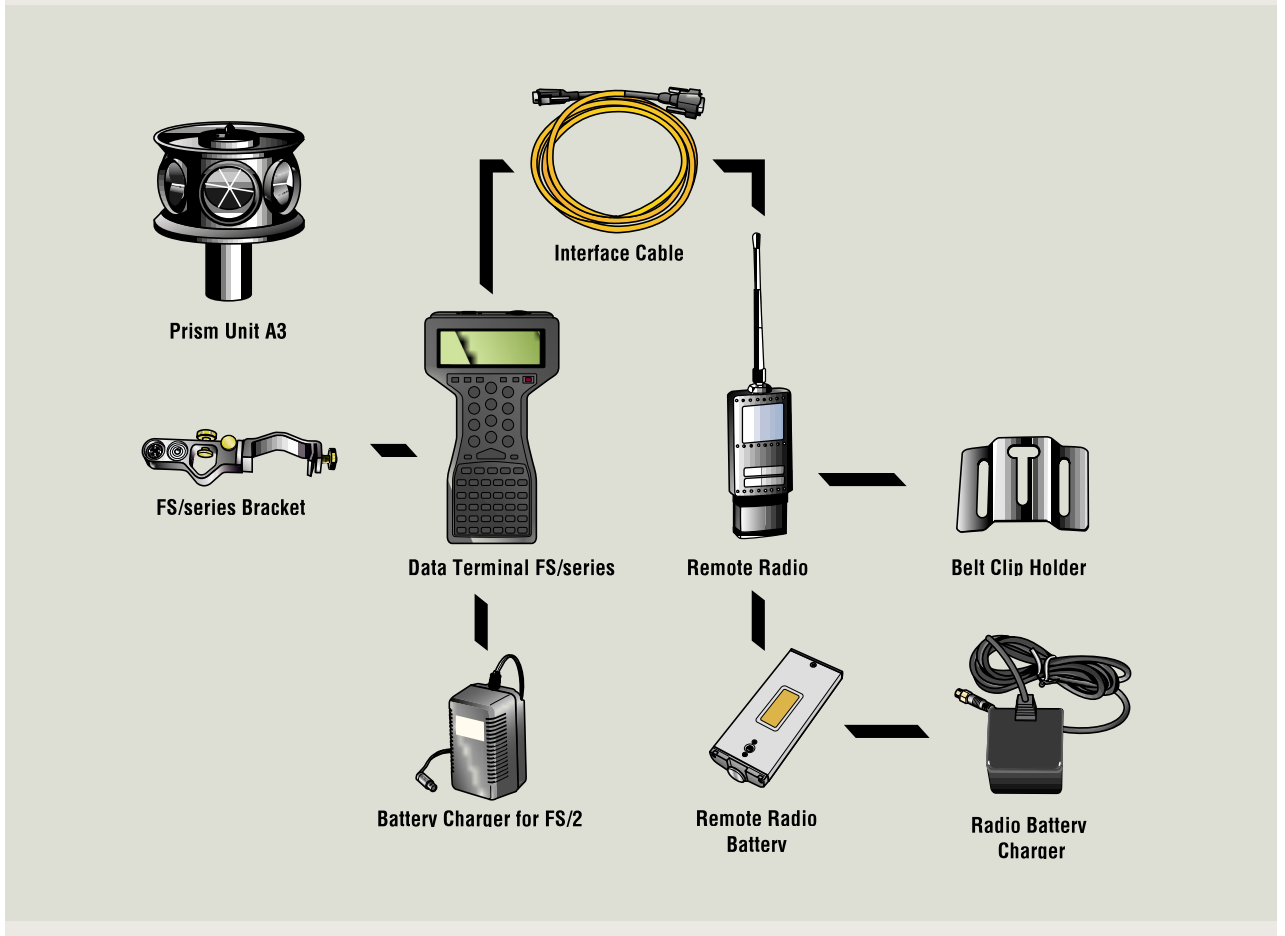
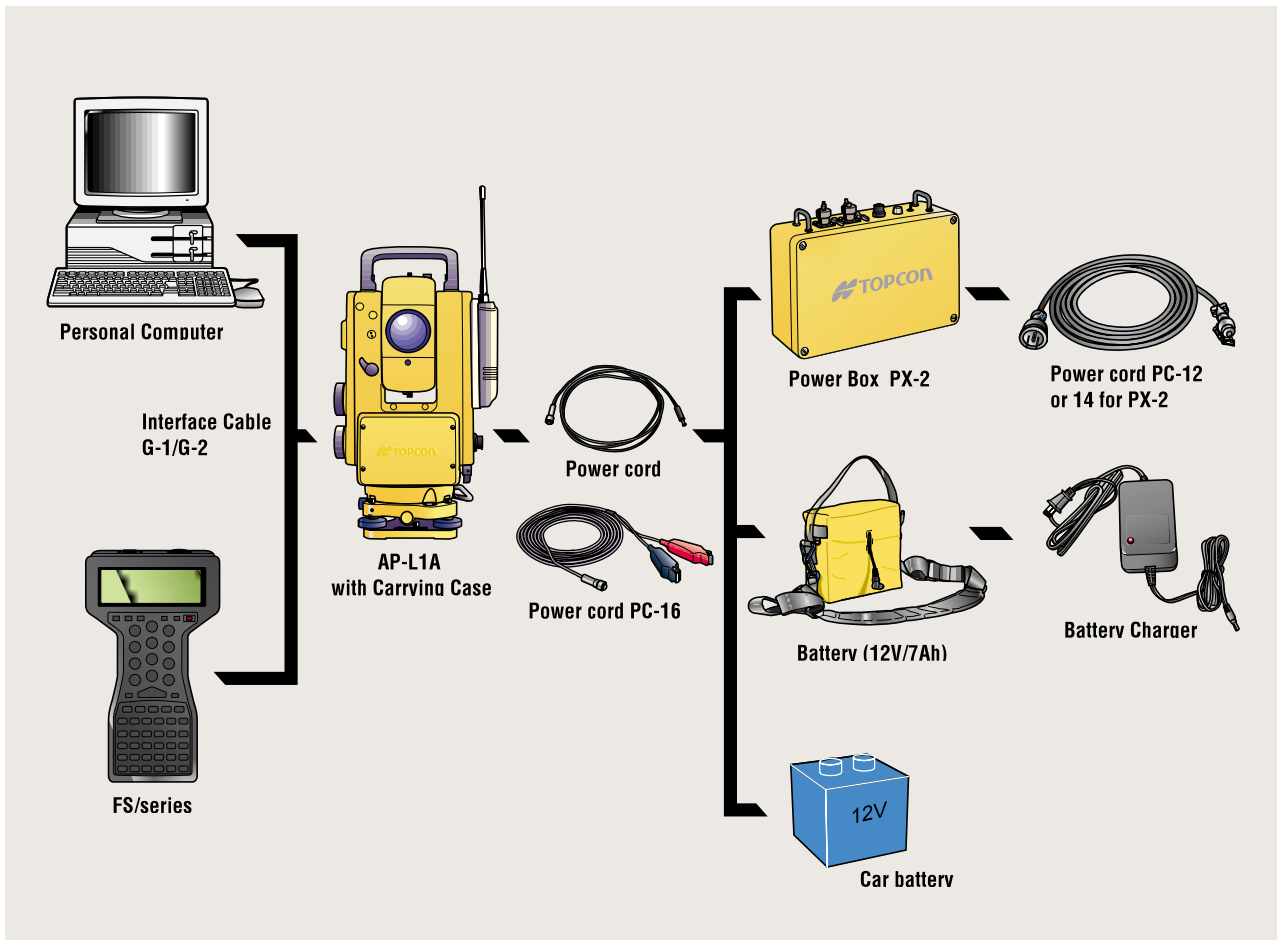
## TDS SURVEY PRO SOFTWARE

- The TDS Survey Pro can control the AP-L1A from the prism point and take the measured data via wireless communication.
- The TDS Survey Pro makes topographic mapping easy with unique user definable code library.
- Up & Down loading of:
  - 1) 3D coordinates
  - 2) Code library
  - 3) Road files
- Contents of application
  - 1) TOPO and Traverse Data Collection
  - 2) Setting Out (point/road/cross section)
  - 3) Traverse Adjustment
  - 4) Offset Observation
  - 5) COGO  
(resection/inverse/intersection/area calculation)
  - 6) Edit and Delete Data
  - 7) Road Calculations





# SYSTEM DIAGRAM



Note: Alternative accessories are available.

# SPECIFICATIONS

| AUTOMATIC TRACKING UNIT        |  |
|--------------------------------|--|
| Maximum Rotating speed         | 45°/sec  |
| Tracking angle speed           | 10°/sec  |
| Operating range                | Fully rotation in horizontal and vertical (360°, 400°)   |
| Search range                   | User definable   |
| Coarse movement unit           | Shuttle operating in 7 speed levels  |
| Fine movement unit             | Log operating (Minimum step 1 second)  |
| Collimation accuracy           | ±3" (in still condition) Standard deviation<br>±2' (8°/sec) Standard deviation   |
| Safety standard for Laser Beam | Class2 (IEC)   |
| Radio Frequency Link           | 500-700m   |
| Used LD                        | Visible  |
| TELESCOPE UNIT                 |  |
| Length                         | 173mm  |
| Magnification                  | 30x  |
| Image                          | Erect  |
| Field of view                  | 1°30'  |
| Resolving power                | ≤3.5"  |
| Minimum focus                  | 1.5m   |
| DISTANCE MEASUREMENT           |  |
| Measurement range              | Pin hole prism: 4m to 700m<br>1 prism: 7m to 1,000m<br>Condition: visibility about 20 km<br>moderate sunlight with light heat shimmer. |
| Measurement accuracy           | ±(3mm +2DDm) m.s.e. (in fine measurement)<br>±(10mm +2DDm) m.s.e. (in tracking measurement)  |
| Least count                    | 0.2/1/10mm   |
| Measuring time                 | 4.5 - 0.22 second  |
| Atmospheric correction         | Temperature • Air pressure/PPM input   |
| Operating temperature limit    | -20° - +50°C   |
| ANGLE MEASUREMENT              |  |
| Method                         | Incremental reading  |
| Detecting system               | 2 sides in Horizontal and Vertical angle   |
| Tilt correction unit           | Automatic correction in 2 axis   |

| Least count                 | 1"/5"  |
|-----------------------------|--|
| Accuracy                    | 2" (0.6meon) (Standard deviation based on DIN 18723)   |
| DISPLAY UNIT                |  |
| Display size                | Dot matrix LCD 16 characters in 4 lines, one side display (with back light/heater/brightness control)  |
| Measuring display           | Maximum 999.999.999m   |
| LEVEL SENSITIVITY           |  |
| Circular level              | 10"/2mm  |
| Plate level                 | 30"/2mm  |
| OPTICAL PLUMMET TELESCOPE   |  |
| Magnification               | 3x   |
| Image                       | Erect  |
| Field of view               | 4°   |
| Operating Temperature limit | -20-+50°C  |
| DIMENSION                   |  |
|                             | AP-L1A 405(H)x216(W)x180(L)mm  |
| WEIGHT (WITH TRIBRACH)      |  |
|                             | AP-L1A: 9.4kg  |
| POWER SUPPLY UNIT (OPTION)  |  |
| Mark light battery          | Output voltage: DC12V<br>Capacity: 8Ah<br>Effective approx. 4-7 hours (at 20°C) for continuous measuring include distance measurement.   |
| Battery charger             | Input voltage: 115 or 230V<br>Recharging time: 4 hours (at 20°C)   |
| Point guide                 | Yes  |
| OTHERS                      |  |
| Wireless Terminal           | Transmission range: Depends on Radio Modem.<br>(Please contact local distributor)<br>Instrument side: Attached to the left cover.<br>Prism side: Built-in Ni-Cad battery is used for wireless terminal |

\* Design and specifications herein are subject to change without notice.

**Important** In order to obtain the best results with this instrument, please be sure to review all user instructions prior to operation.



Certificate No.Q18661  
TOPCON CORPORATION



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Certificate No.EC97J1081  
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