Figure 19.10 Charge controller with integrated voltage and current meter (Courtesy: STECA Solarelektronik, Germany)

to parameterise the controller, to read out the status of the system or to download operation data from the built-in data logger. Another feature is to communicate with external balance-of-system components via power line transmission.

In Solar Home Systems, the charge controller can act as an energy meter or can be used to automatically debit energy costs from a pre-paid card.

19.1.1.8 Design criteria and appraisal factors for charge controllers

The following summary of requirements is intended to support a designer or a purchaser of a charge controller. Which of these requirements must be met has to be decided specifically for each individual application.

The values of voltage thresholds and so on are related to lead acid batteries.

1. Charging phase.

- The end-of-charge voltage threshold should be adjustable according to the battery in use (2.3–2.5 V/cell at 25°C). To prevent extreme misadjustment, the setting range should not extend beyond these limits.

- The end-of-charge voltage can automatically be adapted to the system voltage (e.g. 12 V or 24 V).

- If the battery temperature is expected to deviate more than ±10°C from the average temperature under operation, the end-of-charge voltage should have a temperature compensation (approximately −4 to −6 mV/K per cell). If the temperature deviation is smaller, temperature compensation is not mandatory and the threshold should be set