Elster A1700 Meter — PMU Interfacing Procedure

Detailed field & office procedure for connecting to, reading and programming an Elster A1700 meter using the Power Master Unit (PMU) software.

1. System Requirements (PC Side)

- PC: Pentium III or better, 256MB RAM minimum, CD-ROM drive, 60MB free disk space, SVGA display (800x600 or higher)
- Operating system: 32-bit Windows application — runs under Windows XP/7/10 in compatibility mode on most sites
- Free serial (COM) port, or USB-to-serial adapter with correct driver installed, for direct/optical connections
- PMU software installed and licensed (dongle or software key depending on version)
- Optical probe (for optical-port interfacing) or RS232 cable (for direct serial interfacing)

2. Hardware Connection Options

There are three ways to interface with the A1700:

- **Optical port** — direct, via an optical probe placed on the meter's optical communication window. No electrical contact with the meter; safest option on a live meter.
- **Serial port (RS232)** — direct cable connection to the meter's comms terminal block, or via a modem for remote/unattended sites.
- **Indirect via Hand-Held Unit (HHU)** — the HHU talks to the meter optically on site, stores the read, then is connected to the PC afterwards and the data is uploaded into PMU. Used where carrying a laptop to the meter location is impractical.

3. Optical Probe Setup (Most Common for Site Work)

- During PMU installation/setup, select the correct probe/communication type in Options > Communication Setup — choose "Optical Probe" as the port type, not "Direct Connect".
- Assign the optical probe to the correct physical COM port (check Device Manager if using a USB-optical probe adapter).
- Set the communication baud rate to match the meter’s default optical baud rate (typically 300 bps initial handshake, auto-negotiating up to 9600 bps once the session is established — consistent with the IEC 62056-21 style negotiation used across most ANSI/IEC meters of this generation).
- Clean the meter’s optical window and the probe lens before seating — dust or condensation is the most common cause of a failed optical handshake.
- Seat the probe squarely over the optical port, held steady (a probe with a magnetic ring or elastic strap reduces read failures from hand movement).
- In PMU, select Communications > Connect (or the equivalent toolbar icon) to initiate the handshake. A successful connection shows the meter’s serial number and firmware/program ID in the status bar.

If the handshake fails repeatedly: re-seat the probe, confirm the correct COM port is selected, and confirm no other application (another PMU instance, a terminal program) is holding the port open.

4. Serial Port (RS232) & Modem Connection

- For a direct cable connection, wire the meter's comms terminals to the RS232 cable per the A1700 terminal block wiring diagram (TXD, RXD, GND at minimum; RTS/CTS if hardware handshaking is enabled).
- In PMU's Communication Setup, select "Direct Connect" and choose the COM port the cable is attached to.
- Set the baud rate to the meter's configured serial baud rate (commonly 1200, 2400, 4800 or 9600 bps — must match what is already programmed into the meter, or the initial connect will fail).
- For remote/modem sites: select "Modem" as the connection type, enter the modem's phone number, and increase the connection timeout (remote PSTN/GSM links need more settling time than a direct cable — 15–30 seconds is a safe starting point).
- Connect via Communications > Connect, same as the optical workflow.

5. Indirect Method via Hand-Held Unit (HHU)

- On site, connect the HHU to the meter optically (same probe/window principle as section 3) and perform the read/program operation using the HHU's own menu.
- Back at the office, connect the HHU to the PC via its cradle or cable.
- In PMU, use File > Import (or the HHU upload utility bundled with PMU) to pull the stored reads into the PMU database.
- Verify the imported record's meter serial number and read timestamp match what was expected before filing/billing off it.

6. Session Parameters & Security Access

Once connected (by any of the three methods above), PMU will prompt for a security level/password before allowing reads or programming:

Level	Typical Use	Access
Level 0 / Read-only	Billing reads, routine data collection	No password, or a universal read password
Level 1 / Field Service	Clock sync, demand reset, minor config	Site/utility-assigned password
Level 2 / Programming	Full re-programming — TOU tables, CT/VT ratios, registers	Restricted password, utility-controlled

Always confirm the password set loaded in PMU matches the meter's program ID family — a mismatched password set is the most common cause of "access denied" on an otherwise successful connection.

7. Reading the Meter

- After connecting, select Readings > Get Current Data (or equivalent) to pull instantaneous values: kWh, kVArh, kVA, demand, voltage/current per phase.
- Select Readings > Load Profile to retrieve interval (load profile) data — choose the date range needed; large ranges take longer over a slow serial/modem link.
- Select Readings > Event Log / History Log to pull the meter's event log (power outages, tamper flags, programming events, clock changes).
- Save the read to a PMU data file (File > Save As) immediately after a successful pull — do not rely on re-reading the meter if the file is needed later.
- Export to the required billing/analysis format (CSV, MV-90, or the utility's own import format) via File > Export.

8. Programming the Meter

- Open or create a program (configuration) file in PMU matching the meter's firmware/program ID — a program built for a different firmware revision will be rejected or, worse, partially accepted.
- Set CT ratio and VT ratio to match the site's instrument transformers.
- Configure the Time-Of-Use (TOU) table if the tariff requires multiple rate periods — season definitions, rate periods, and holiday/special-day tables.
- Set the real-time clock — sync to PC time, or PC time with a defined offset, before sending the program.
- Review the full parameter set on screen against the intended configuration before sending — PMU will show a comparison of what is currently in the meter vs. what is about to be written.
- Select Program > Send to Meter. Do not interrupt power or communications during the write — an interrupted program write can corrupt the meter's configuration and require a full re-program or factory reset.
- After the write completes, immediately read the meter back and verify the key parameters (CT/VT ratio, clock, TOU) were applied correctly.

Always keep the previous working program file before sending a new one — if the new configuration causes unexpected billing behaviour, you need a known-good file to roll back to.

9. Demand Reset & Other Field Operations

- Billing (demand) reset: Operations > Reset Demand — clears maximum demand registers after the read has been recorded for billing. Confirm the read is saved first; a reset cannot be undone.
- Clock sync without a full re-program: Operations > Set Clock.
- Remote disconnect/reconnect (if the A1700 unit has a disconnect switch fitted): Operations > Remote Switch Control — gated by the same security level as programming.

10. Troubleshooting Quick Reference

Symptom	Likely Cause	Fix
No response on connect	Wrong COM port, probe not seated, wrong baud rate	Re-check port/probe seating, confirm baud rate ma
Connects, then "access denied"	Wrong password/security level for the operation requested	Confirm the correct password set/level is loaded fo
Program send fails partway	Comms dropout during write (loose probe, weak modem link)	Re-seat connection, retry; if meter now reads abnor
Load profile read very slow	Long date range over slow serial/modem link	Narrow the date range, or use a faster direct/optica
Imported HHU data missing readings	HHU read interrupted on site, or wrong meter selected during import	Re-read the unit; verify serial number before accepti
Clock drifts after sync	Meter's internal RTC fault or extreme temperatures on site	Resync more frequently; flag meter for RTC check i

11. Commissioning Checklist

- PMU installed, licensed, correct COM port identified
- Connection method chosen (optical / direct serial / HHU) and tested
- Correct security password set loaded for the meter family
- CT ratio and VT ratio set to match site instrument transformers
- TOU table and clock configured and verified on read-back
- Initial read taken and saved before any demand reset

- Program file archived (dated, tagged with meter serial number) before and after any re-programming
- Final read taken to confirm meter is recording correctly post-commissioning