Here’s a **T-Doc style memo** for your future self, documenting the full process of building SOEM from source on Windows using Visual Studio 2022 and CMake, including the workaround for generating missing headers like nidrv.h and ec\_options.h.

**🧾 T-DOC: Building SOEM with Visual Studio 2022 + CMake on Windows**

**Author:** Philip Rose\ **Context:** Building SOEM (Simple Open EtherCAT Master) from source for use in a C/C++ shim library with C# P/Invoke integration.\ **Goal:** Generate a working SDK with all headers (including nidrv.h, ec\_options.h) and compiled binaries.

**✅ Prerequisites**

1. **Visual Studio 2022**
   * Install the **Desktop development with C++** workload.
   * Ensure **MSVC v143 - VS 2022 C++ x64/x86 build tools** are installed.
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2. **CMake**
   * Install the latest version from <https://cmake.org/download/>
   * Add cmake to your system PATH.
3. **SOEM Source**
   * Download from <https://github.com/OpenEtherCATsociety/SOEM>
   * Extract to a working directory, e.g., C:\dev\soem
   * A screenshot of a computer

     AI-generated content may be incorrect.

**🛠️ Build Instructions**

**1. Create a Build Directory**

mkdir C:\dev\soem\build

cd C:\dev\soem\build

**2. Run CMake with SDK Output Path**

This step is **critical** — it triggers CMake to generate the missing headers (nidrv.h, ec\_options.h) and install them into a custom SDK folder.

cmake .. -DCMAKE\_*INSTALL\_*PREFIX=C:\dev\soem\sdk -G "Visual Studio 17 2022"

* -DCMAKE\_INSTALL\_PREFIX tells CMake where to install the SDK (headers + libs).
* -G "Visual Studio 17 2022" ensures the correct generator is used.

**3. Build and Install**

Open the generated SOEM.sln in Visual Studio, or build from command line:

cmake --build . --config RelWithDebInfo --target INSTALL  
This will:

* Compile the SOEM libraries.
* Install headers and binaries to C:\dev\soem\sdk.

**📁 Resulting SDK Layout**

C:\dev\soem\sdk\

├── include\

│ ├── soem\

│ │ ├── ethercat.h

│ │ ├── ethercatmain.h

│ │ ├── ec\_options.h <-- generated

│ │ └── nidrv.h <-- generated

├── lib\

│ └── soem.lib

**🧩 Notes**

* nidrv.h and ec\_options.h are **not in the raw source** — they are generated by CMake during the install step.
* If you skip --target INSTALL, these headers will be missing.
* You can now link against soem.lib and include headers from sdk/include.