Frequently Asked Questions about Cambridge Technology ScanMaster™ Controller Solutions

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1 Introduction

This technical bulletin addresses some of the recent questions about how to integrate Cambridge Technology ScanMaster™ Controller Solutions into their laser systems.

2 How do I choose a laser adapter?

There are several popular commercial laser adapters to choose from depending on the type of laser you have and what your needs are.

Table 1 - **Laser adapters for popular commercial lasers**

Manufacturer	Model	Adapter
Coherent	Avia_355-X	LSR-03
Coherent	Coherent-C70	LSR-05
Coherent	Diamond E-400	LSR-05
IPG	YLM	LSR-01
IPG	YLP	LSR-01
IPG	YLR	LSR-04
IPG	YLS	LSR-01
SPI	G3	LSR-02
SPI	G4	LSR-02
Synrad	Ti60	LSR-03
VGEN		LSR-01

LSR-01 – Provides IPG YLP 25 pin compatible connector.

LSR-02 – Provides connector used by SPI Lasers on their G3 and G4 models.

LSR-03 – A LSR-01 connector with BNC style LaserMod out signal.

LSR-04 – 24V compatible, provides customizable connections via Phoenix style connections and a TTL BNC modulation signal.

See the SMC hardware reference manual for details.

3 What additional features does the SMC Auxiliary I/O board provide, and when would I typically use one?

Use the SMC Auxiliary I/O board when you need extended Input/Output (see below) or a second XY2-100 connection. The Auxiliary I/O board includes Phoenix Contact industrial automation connectors for easy PLC connections.

- XY2-100 25 pin connections
- Second XY2-100 port
- DB9 COM port (COM3)
- 16 new AUX inputs (0-15)
- 16 new AUX outputs (0-15)
- Phoenix connectors for easy wiring
- RS485 Phoenix connection
- 5V or 24V I/O operation

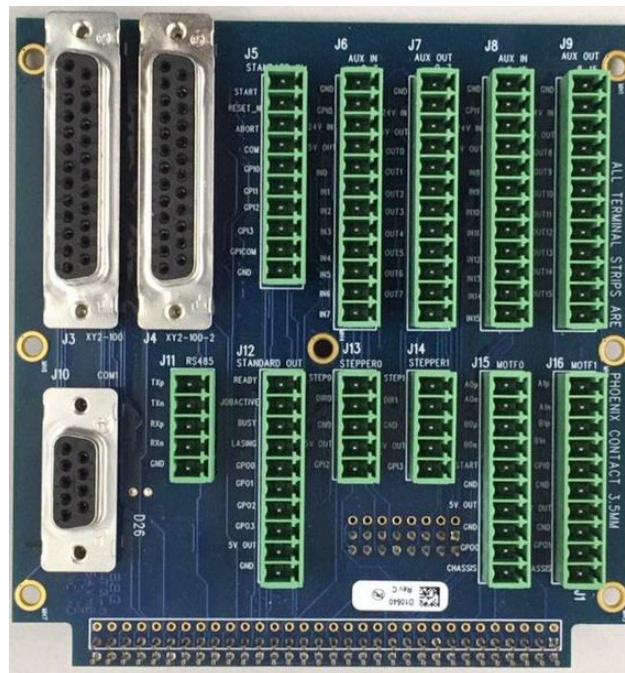

Figure 1 - SMC Auxiliary I/O board

Use the SMC Auxiliary I/O board when you need the extended I/O (see above) or a second XY2-100 connection. The board also provides Phoenix Contact industrial automation connectors for easy PLC connections.

4 Can you compare some of the common APIs and which Cambridge Technology controllers they support?

Table 2 - **Comparison of APIs supported by Cambridge Technology controllers**

API	Description	Similarities & Differences	Limitations	Controller
ScanMaster API (SMAPI)	The common API for all Cambridge Technology controllers and the recommended API. It allows you to incorporate complex shape rendering, such as barcodes, text, hatching, etc. into your applications. *Recommended selection.*	Built on top of the XML API, it adds much more functionality, including scripting and complex shape support. Actively supported, including bug fixes and enhancements.	Requires Visual Studio® but is the most functional choice. Requires .NET 4.0 Runtime.	All Cambridge Technology controllers
XML API	XML API is a common API for EC1000/SM1000 and SMC controllers. It allows vector oriented low level control of marking operation.	Similar in scope to SMAPI for vector marking but without basic support for high level shapes. Actively supported, including bug fixes and enhancements.	Jobs are represented as ASCII text in XML format. Less powerful functionality than SMAPI. Error codes with some description. No line numbers with errors.	EC1000/SM1000 or SMC
Universal API	An earlier API used with the SC500 Visual Studio VC++ environment.	Similar in capability to XML API.	Less functional than SMAPI. Bug fixes only. Not recommended for new development.	SC500
Remote API	An ASCII based API allowing the remote control management of controllers and their jobs.	To be used with PLC based control systems.		EC1000/SM1000 or SMC

5   What is ScanScript? Is it available through SMD and all types of APIs?

ScanScript is a domain-specific scripting language designed to support many intricate scenarios in the laser scanning industry. This lightweight yet powerful scripting language consists of several libraries of dedicated algorithms to perform laser scanning functions such as marking job flow control, process automation through I/O and much more. ScanScript is extensively used by SMD to extend its capabilities in automation situations. It is not available from the XML API.

6   What are the differences between J1 (Power) and J3 (24V)? How do you choose between them?

J1 is the standard power connection for SMC (differential voltage between V+ and V- must be in the range of 15–48V). J3 input is optional and is designed to conveniently supply digital I/O optical isolators on the expansion I/O board.

7   How many scan heads can a single SMC control?

The SMC can control two heads. Current design is limited to using the same job, one laser, but with different correction tables for each head.

8   What is the current status of MOTF function?

MOTF job setup is done in ScanScript. SMC supports either X or Y tracking.

9   What features does SMC currently support that SC500 and EC1000 do not?

SMC has ScanPack mode, supports more I/O options, and has faster processing, more working memory, and more onboard storage capacity for holding larger and more jobs than both SC500 and EC1000.

10 Is it possible to get tightly synchronized control of two SMC cards with four scan heads?

Yes, it's possible to get tightly synchronized control of two SMC cards with four scan heads. The user needs to control the two SMC controllers via a programmable PLC controller so they both get the same start signal.

11 How do I set up the Start Mark signal on SMC?

The easiest method to set up the Start Mark signal on the SMC is to connect a switch between pin 3 (start signal input) and pin 4 (GND). You can use the following code in SMD ScanScript to have your program wait for the start signal.

```
Report("Waiting for the StartMark")
count = 1
while true do

    if (Io.ReadPin(Pin.Din.StartMark)==true) then

        Report("Accepted the part Start Marking")

        ScanAll()
        Laser.WaitForEnd()
        Report("Marked" ..count)
        count = count + 1
        Sleep(1000) --for a short job you may need some time to release the switch
    else
        --Keep the part on conveyor or start system
        Sleep(10)
    end
end
```

12 How do I set up 5V Digital inputs on SMC?

The following diagram shows the setup to attach a button/switch to an SMC Digital I/O board input for 5V. Operation and switch on UserIn1.
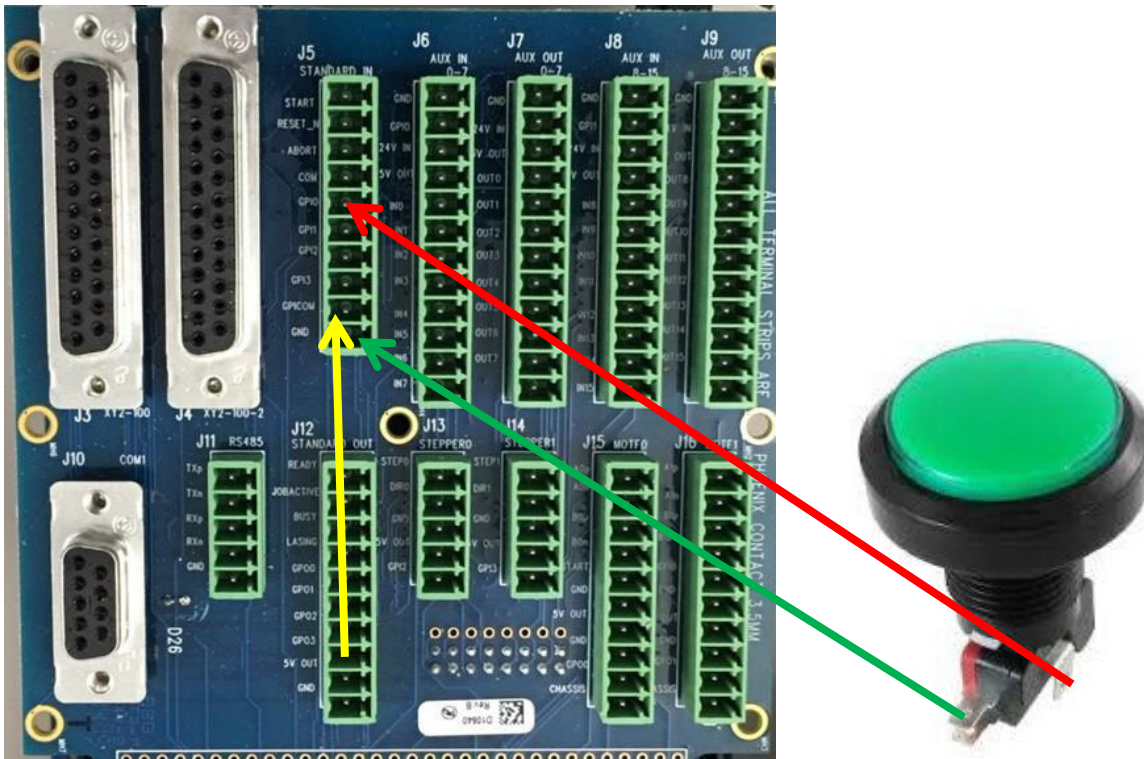
Figure 2 -

Connection	Description
Any 5V Out to GPICOM	Provides 5V TTL operation
One end of switch to GPI0(Gen. purpose in #0=UserIn1)	Provide switch operation I/O to UserIn1
One end of switch to GND	Provide Ground ref. to switch

13 SMD gives me the following error when I try to run a job: "SMC does not have the license to run this job. (200212.)" How do I get a license?

Customer Service will need two items of information to send you a license file:

1. The sales order number from your controller purchase.
2. The internal license key number from the controller:
   a. For SMC or EC1000, run the corresponding firmware loader application for the controller you are using (see section 4.2 - Running the Firmware Loader).
   b. For the SMC, you can also access the key using the configuration editor (see step 4 - Select device configuration).

Once the Firmware loader is running and the appropriate controller selected, note the license key number that is found in the lower left corner. Send this number along with the original Sales Order number to Cambridge Technology Technical Support. You will receive a license file in via e-mail.
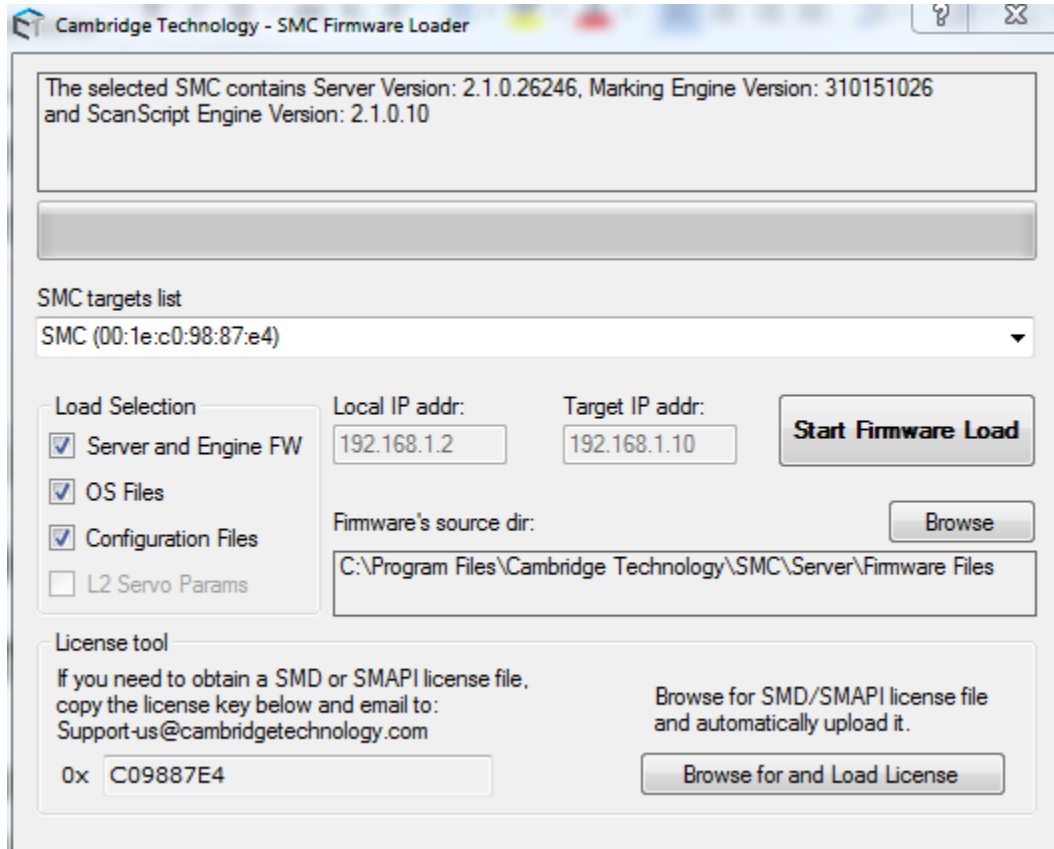
14 I installed the software and can see SMC on the network via ping, but the CTI software doesn't see the SMC device. What may be the problem?

Because the Cambridge Technology controllers are network-based devices, Cambridge Technology applications must have permission to go through the Windows Firewall to work properly. If your firewall is blocking the broadcast monitor, it will not show any devices present.

For example, most Cambridge Technology applications need to sense the presence of controllers that periodically broadcast system information on the network. If the broadcast packets are blocked from reaching the applications by the Windows Firewall, they will not be aware of them and hence, not be able to connect to them.

Please enable Firewall access to the Home/Work, and Public network categories for all Cambridge software products. It may also be necessary to enable the Domain category at some sites.

You can access the firewall settings by:

Start→Control Panel→System and Security→Windows Firewall→Allowed Programs