CFM-Lite Installation Manual

Crimp Force Monitor

CFM-Lite

Ver 1.1

Update history

Version number	Date	Updated by	Detail
Version 1.0	2017.10.24	Masato Sato	
Version 1.1	2018.12.14	Masato Sato	1.1 & 2.1 description for dongle is updated.

CONTENTS

1. Overview

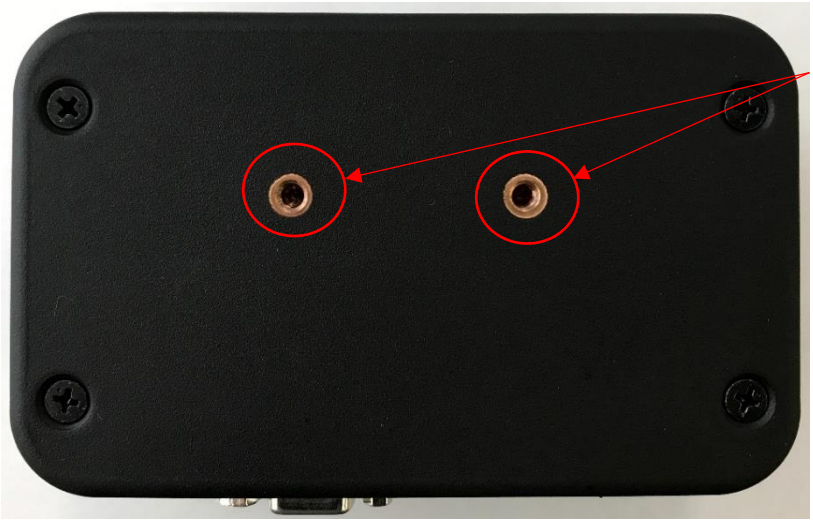
This manual guides you the way how to install the system successfully.

1.1. The main unit, standard accessories and optional accessories

Front

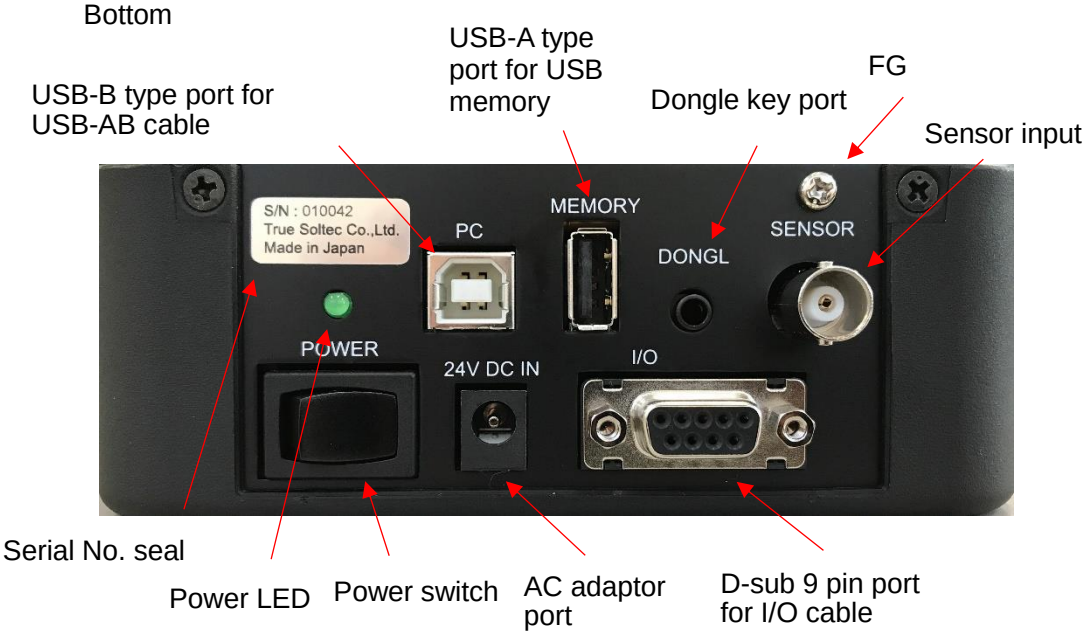
All are operated via the touch panel in the front. Only the power switching button is located at the bottom.

Rear



Bracket set holes（M5）

Bottom

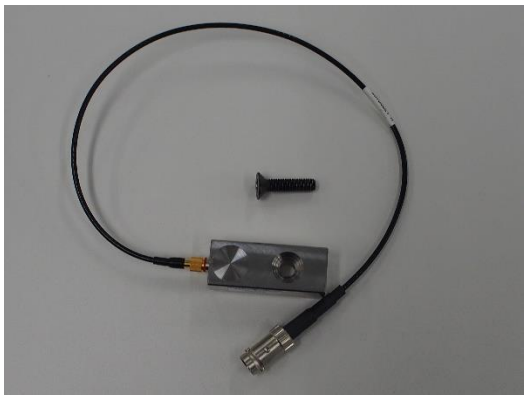


FG (Frame Ground) must be connected firmly to the earth via e.g. the earth terminal of the table tap, crimping machine, the formal earth terminal prepared by the factory in order to prevent the external noise.

Accessories

Packed together	**Non packed together**
CFM-Lite main unit	PC software (available by download from PC web site)
Sensor : Standard is PSS type, optionally available is FTW or FTC model.	General instruction manual and Installation manual (available by download from PC web site)
BNC cable for sensor	PC (user preparation)
I/O cable for control	USB-AB type cable (user preparation)
AC adaptor	USB memory (user preparation)
Dongle key (optional item)	
Mounting bracket	
Basic instruction manual (print)	

Photos of packed items:



PSS sensor

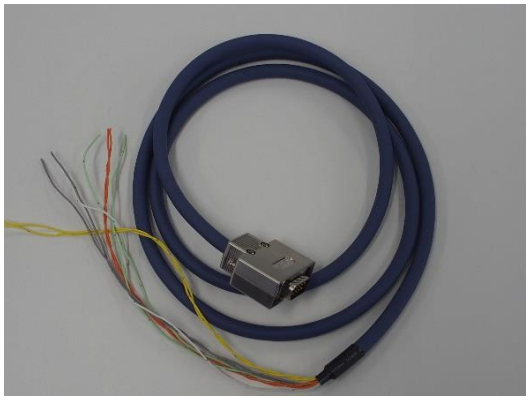
Force detection is made by measuring the machine body's elongation. See sensor details at 1.11. Sensor

AC Adaptor

Noise proof type adaptor is prepared. Caution: Do not use other low cost AC adaptors in the market.

BNC cable

1.5 m long BNC cable connects the force sensor and CFM-Lite main unit.

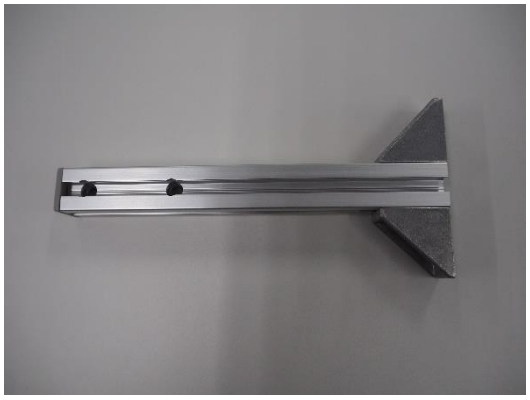


I/O cable

1.5 m long Input and Output cable with D-sub 9 pins connector for connecting CFM-Lite and the machine control

Dongle key (optional)

This key blocks selected operations from unwanted hand of operators



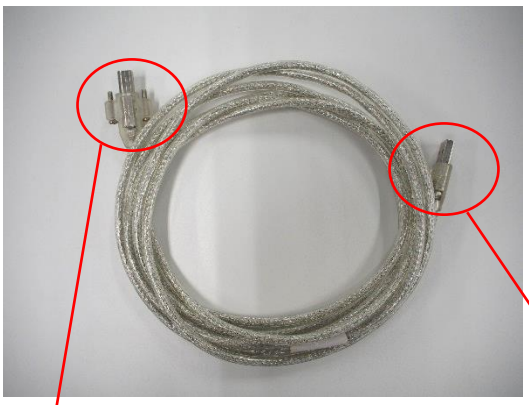
Mounting bracket

Standard bracket for mounting the main unit: 170mm long body can be set by the triangle base plate (M5).

Photos of non-packed together

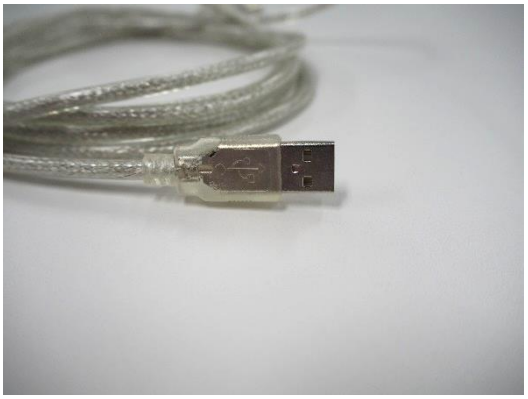
PC is to be normal type in the market.

USB cable is available in the market, too.



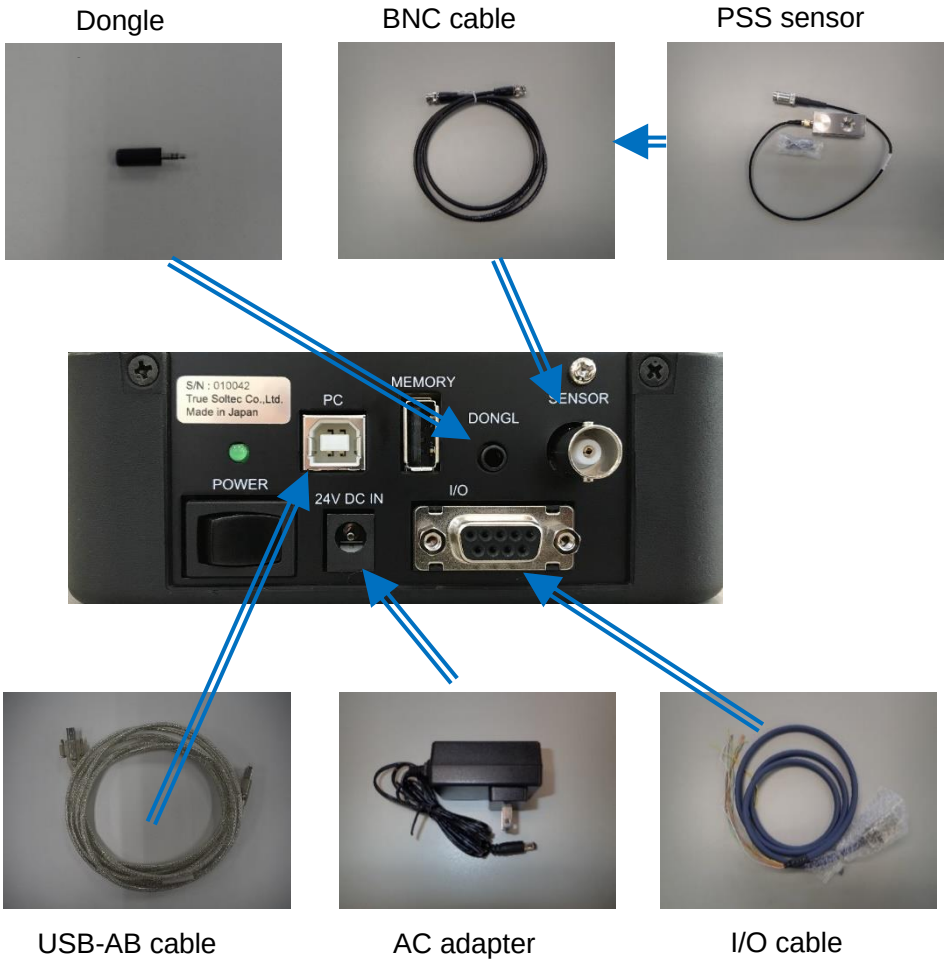
USB cable (AB type)

B connector



A connector

1.2. Connection of accessories



1.3. Main specifications of the unit

Outer dimensions	W 137mm x H 84mm x D 50mm
Analog sensor signal	Resolution 12bit Max sampling rate 20kHz
Sensor	FTW series (ring type force sensor, cable output, 0.1 to 10 ton) PSS series (piezo strain sensor, high /middle / low sensitivity models) FTC series (ring type force sensor, connector output, 2 or 4 ton)
I/O cable	“Refer to 1.5. Input and Output”
USB communication	1) PC communication (USB2.0) 2) USB data memory（max 64GB saved）
Power	Adapter Tec made, model ATM012T-W240U (Input 100～240V AC、Output 24V DC・0.5A) Other all AC adaptors are out of warranty if trouble should happen.
Operating temperature	0～40 degrees C, Humidity 90% or lower but no dew
Circumstances	RoHS regulation is performed.

1.4. Terms explanation

Crimp Force Monitor = CFM : CFM monitors cable's terminal crimping is monitored by using a force sensor. Every crimped force data is compared with the standard (= good) force data (reference force curve) to judge if it is a good crimping or defect.

Operation = OPE.: It is a mode of CFM-Lite. It controls data if it is good or bad. Production is done under OPE mode.

TEACH: It is a mode of CFM-Lite. Before starting production, two good crimp data will create the reference force curve by which next coming all data can be judged. This mode teaches the standard; therefore we say it as "Teach".

Tolerance : Data deviation from the standard is expressed by percentage %. The acceptable limit of + tolerance value and – tolerance value will be setup for controlling good and defect data.

Parameters : Only selected parameters can be accessed by touching the front panel of the main unit. All the others can be precisely conditioned by selecting parameters by PC software.

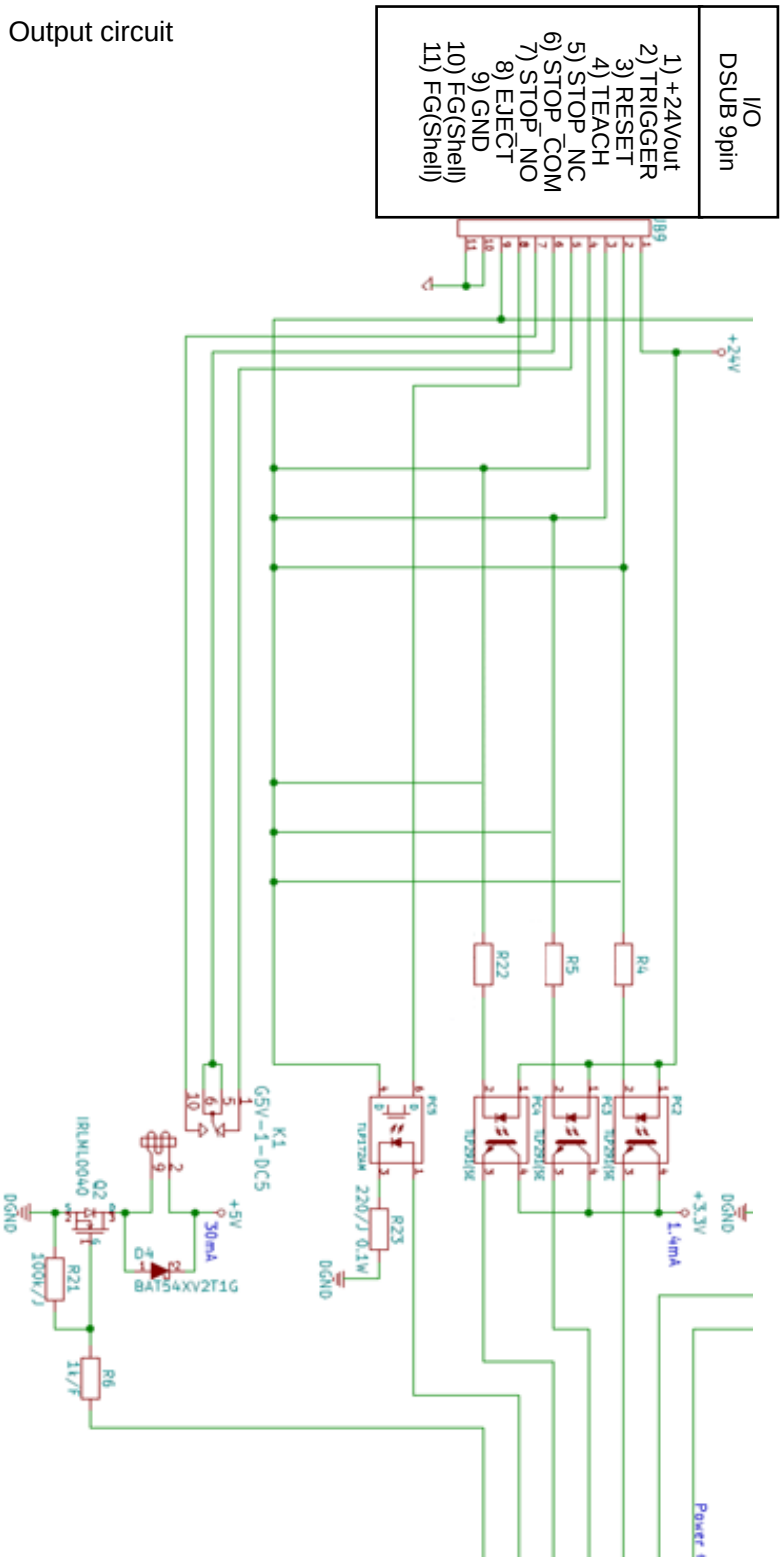
Trigger : This word is used in broad sense. We mean it as the start timing of force signal getting. There are two ways of triggering; one is the automatic trigger "Auto Trigger" CFM-Lite detects the right force level to start getting automatically, and the other is the external switch trigger which is made by a high response type sensor set on the crimping machine monitoring the machine ram motion. Normally the automatic trigger can work. However bad machine conditions and poor material quality will make force data very unstable. In such cases, we should recommend you to use the external trigger. Consult with us or our agent.

Stop signal : CFM-Lite outputs stop signal when it detects a defect crimp. It locks the machine not to re-start production until the operator checks it and remove the cause. The stop signal line is often connected in series to the foot switch circuit of manual press.

Eject signal: For more advanced machines using automatic running system will use this signal as the confirmation of good crimp completion. The machine will receive this pulse signal to take the next cycle.

1.5. Input and Output

Input and Output circuit



I/O pin assignment

PIN No.	Description		Wire color
1	Power	24V(output)	Orange/Black 1
2	TRIGGER	External trigger input	Orange /Red 1
3	RESET	External reset input	Yellow/Black 1
4	TEACH	External teach input	Yellow/Red 1
5	STOP	Stop signal (N.O)	Green/Black 1
6	STOP	Stop signal (COM)	Green/Red 1
7	STOP	Stop signal (N.C)	Gray/Black 1
8	EJECT	Eject output	Gray/Red 1
9	GND	Ground	White/Black 1

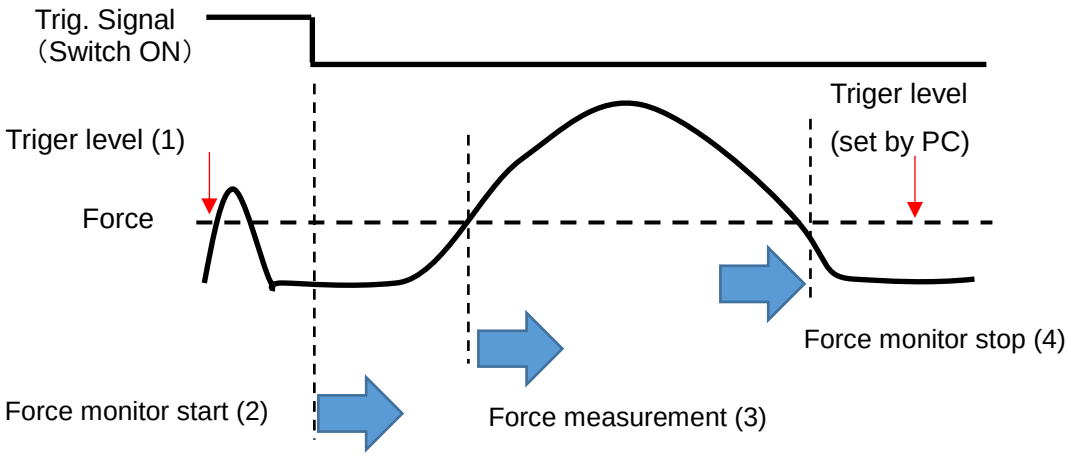
1.6. Signal interface

See “1.5 Input and Output”

1.6.1. External trigger input

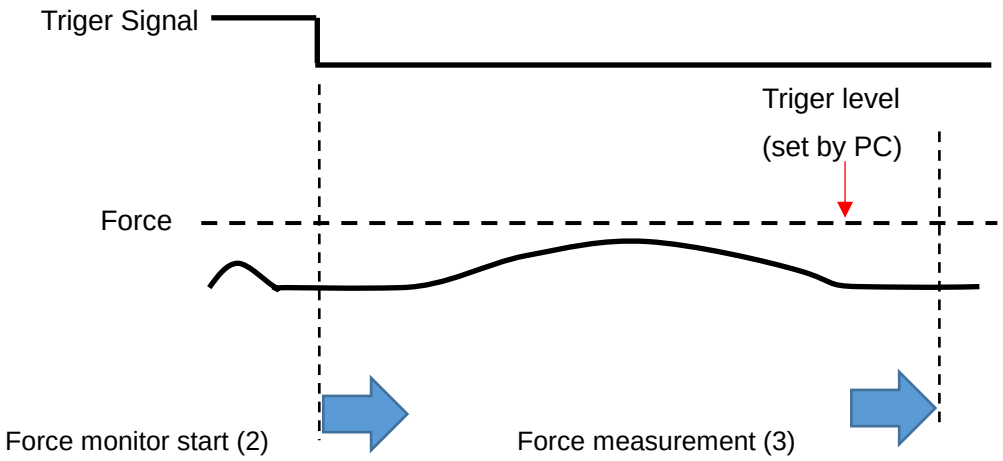
A high speed optical switch will make the pin 2 (TRIGGER) and pin 9 (FND) shorted for triggering. But, if the automatic trigger mode is selected, this signal is ignored. This trigger timing is expressed as HIGH to LOW change. The system demands Low period longer than 10m seconds.

[Diagram] Signal exceeding the trigger level



The measurement starts from (3) and ends at (4). Internally the system gets margin area 10% each for left and right sides.

[Diagram] Signal not exceeding the trigger level



It monitors for 100msec. to confirm that force curve exceeds the trigger level. If it cannot confirm such exceeding of the trigger level, the force curve with peak of at (2) – (3) period is obtained.

1.6.2. External RESET

RESET signal release errors of data error, sensor error and TEACH error. It is the external resetting, which will be sent from the press machine or external switching box. To make it ON, pin 3 (RESET) and pin 9 (GND) should be short circuited. When the system operates without error, this RESET signal is ignored. Caution: make the low time (short-circuited) longer than 10msec. for sure.

1.6.3. External TEACH

TEACH signal starts teaching. It is the external TEACH signal from the machine. Make pin 4 (TEACH) and pin 9(GND) short circuited to set ON. When the CFM is already in TEACH mode, this signal is ignored. Caution: make the low time (short-circuited) longer than 10m sec. for sure.

1.6.4. STOP signal

STOP signal stops operation of machine. There are normally open (NO) signal and normally close (NC).

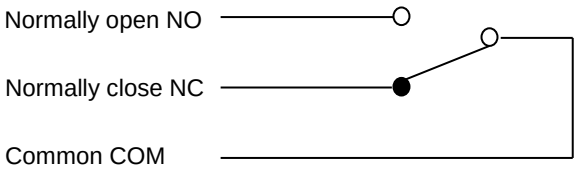
NO:

When the main unit is turned on, it keeps the relay contact opened.

NC:

When the main unit is turned on, it keeps the relay contact closed.

The below is the relay contact circuit. It shows the normal mode. When it should happen error, the mode is reversed, namely the NO contact is closed and NC contact is opened.



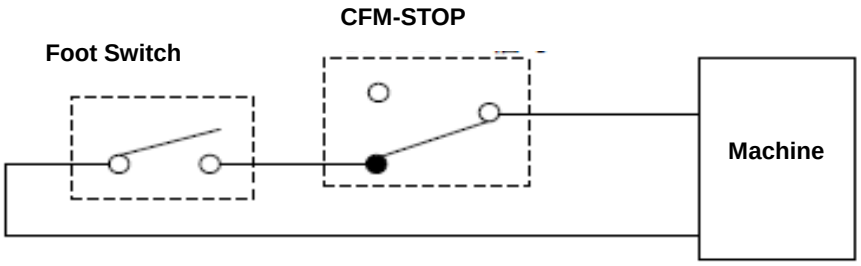
Stop signal contact

5	STOP	(N.O)	GRN/BLK 1
6	STOP	(COM)	GRN/RED 1
7	STOP	(N.C)	GRY/BLK 1

Contacts condition

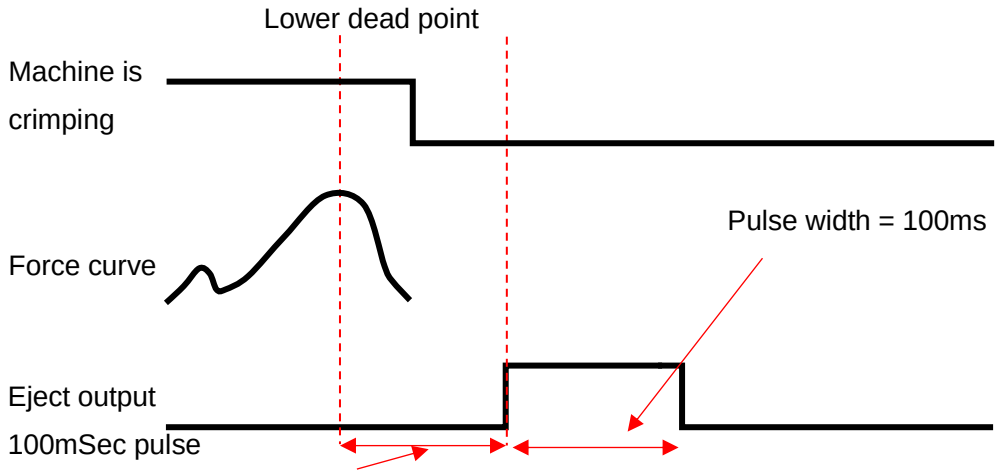
	Pin 5(STOP (N.O))	Pin 7(STOP (N.C))
Power OFF	Close	Open
TEACH	Open	Close
OPE	Open	Close
Tolerance setting	Close	Open
Parameter screen (PC)	Close	Open
Error happens	Close	Open

Ordinary manual type press control has no special connector for external stop signal. Therefore, we recommend you to break the foot switch circuit for CFM stop signal in serial so that the foot switch can be locked at the error detection. See “2.4 Interlocking signal (STOP) for press machine”.



1.6.5. EJECT

EJECT signal is output to a semi-automatic machine which has the electrical control functions to receive the eject-pulse signal as the confirmation of good crimp and start the next press cycle. The eject pulse width is 100m sec. It is possible to select Eject output at good crimping or bad crimping as a parameter. Normally Pin 8 (EJECT) and 9(GND) is open (= HIGH). When EJECT is output, it becomes LOW and maintain 100ms and returns to HIGH. See “3.3 Eject signal connection”.



Eject is output within 100ms when the unit is set as short measurement mode (measurement max. 100ms).

Eject is output within 500ms when the unit is set as long measurement mode (measurement max. 500ms)

1.7. PC communication

See [1.3 main unit specifications]

1.8. AC Power adaptor

See [1.3 main unit specifications]

1.9. BNC

BNC cable is used for the sensor connection. Use only ours.

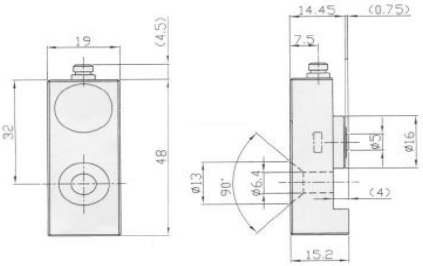
1.10. USB memory

Force curve is kept in the USB memory. When it is inserted to the USB port, data is automatically stored in time order.

1.11. Sensor

Piezoelectric strain sensor, PSS50

PSS50 is provided as standard accessory. It can be screwed to machine body easily. Refer to “2.3 PSS sensor installation” for details. It’s sensitivity is 90mV/μST. The μST is called as micro-strain, a physical term expressing how micron meter elongated per 1 meter long base material. This sensor outputs high voltage in proportion to applied elongation. Namely, when the machine body strains at crimping, PSS sensor output proportional voltage to it



Sensitivity	90mV/μstrain(PSS-50)
Rated strain limit	50μstrain (physical overload is 400μstrain)
Low cut frequency	About 0.1Hz
Linearity	3FS %
Output impedance	100Ωor lower
Base noise	500μVrms or lower
Carrier base voltage	11V±1V
Recommended set torque	7～10N-m
Max. allowable torque	10N-m
Net weight	About 73g
Power	Voltage 24～27V,　constant current2～10mA
Operating principle	Sharing, piezoelectric effect
Sensor casing	Stainless steel
Connector	Miniature type, No.10-32UNF
Set screw	M6 type set screw, flat head、φ6.4mm
Operating temperature range	-20～60 degreeC

Other PSS series sensors: PSS100, PSS25

PSS100 is of 160mV/μstrain for highly rigid type press machines.

PSS 25 is of 40mV/μstrain for low rigid machines.

* For selection of right PSS model, please consult with us. They are all same size. Only the sensitivity is classified.

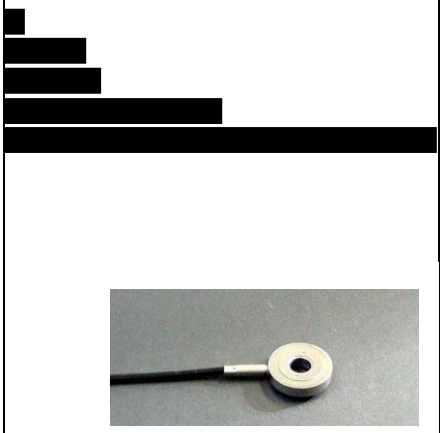
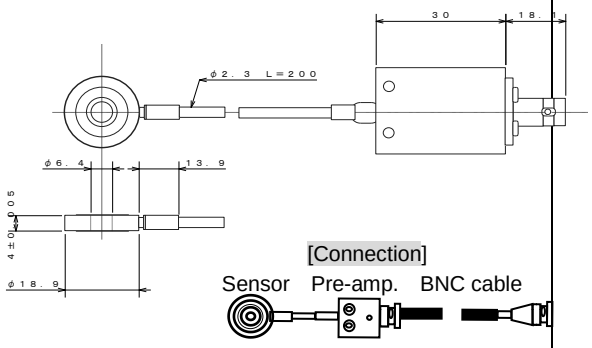
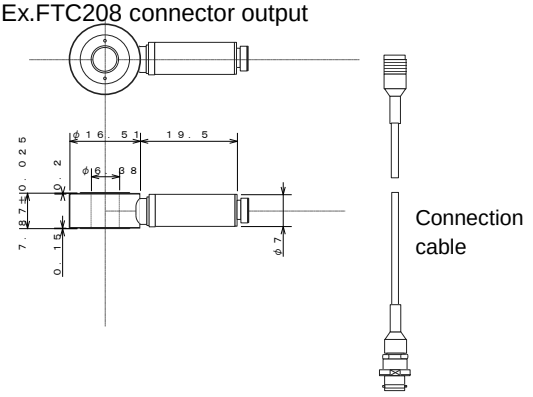
Other sensors are also available.

When your press has no space to put PSS sensor or you prefer to receipt of the force directly – not via machine's distortion, you can choose our ring type piezoelectric force sensors.

- FTW series are cable output type, ranging from 100kg, 500kg, 1ton, 2ton, 2.5 ton, 5ton and 10ton.
- FTC series are connector output type, ranging 2ton and 4 ton.

In order to receive the crimping force, the sensor must be set in the applicator's base plate or the machine ram. Usually we recommend to put the FTW sensors in the base plate, which will be designed and fabricated by us. You will consult with us or our agent for sensor selection, location of sensor, jig design and installation. It must be done before issuing your purchase order.

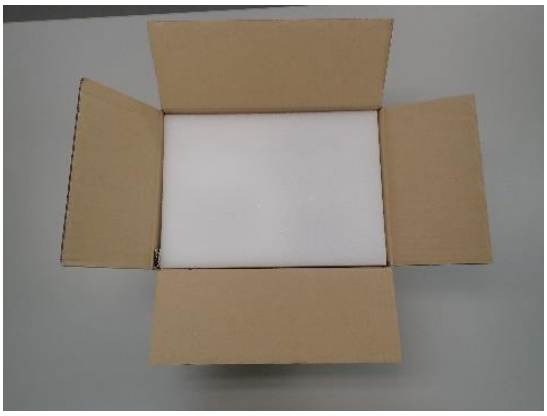
As for the base plate type installation of FTW sensors, refer to "3.2 base plate and sensor preloading".

Sensor model (max load) FTW05(500kg) FTW20(2t) FTW255(2.5t) FTW50(5t) FTW100(10t) **[FTW]** They are sandwiched in the base plates		Ex.FTW20 cable output 
FTC208(2t) FTC408(4t) **[FTC]** They are pinched in the ram adaptor. Sensor cable must be routed carefully not for breakage		Ex.FTC208 connector output 

2. Installation

How to install CFM-Lite to the crimping machine is explained here. Starting from opening the delivery box, setup the main unit, sensor installation, wiring, and installing PC software are described in order with pictures for easy understanding. After finishing all procedure, crimping production with CFM-Lite will be available.

2.1. First of all : opening the box



1. Open the special box. There is a urethane lid.

2. Below the lid, there is a print of CFM-Lite basic instruction manual.

3. Below the manual print, there is an upper urethane container. Below parts are put in each slits.

A. Sensor
B. CFM-Lite main unit
C. AC adapter

Below the upper container, there is a lower container. There are parts put in each slits also.

D. I/O cable, BNC cable, screws for mounting bracket, dongle key (optional item) are packed together

E. Mounting bracket

F. Triangle base plates 2 pcs.

2.2. Packed parts

Take out the following parts from the special box.

CFM-Lite main unit

PSS sensor

AC adapter

I/O cable
(9 pin 1.5m)

BNC cable
(1.5m)

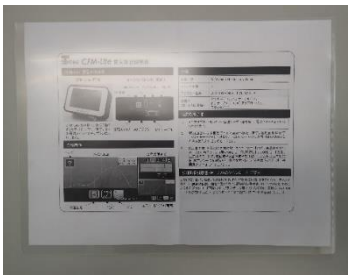
Mounting bracket main bar

Triangle base plats 2 pcs.

M5 x 10 black cap bolt 4 pcs.

M5 x 25 black cap bolt 2 pcs. M5 flat washer 2 pcs.

M5 after nut 2 pcs.



Basic instruction manual

Dongle key (optional)

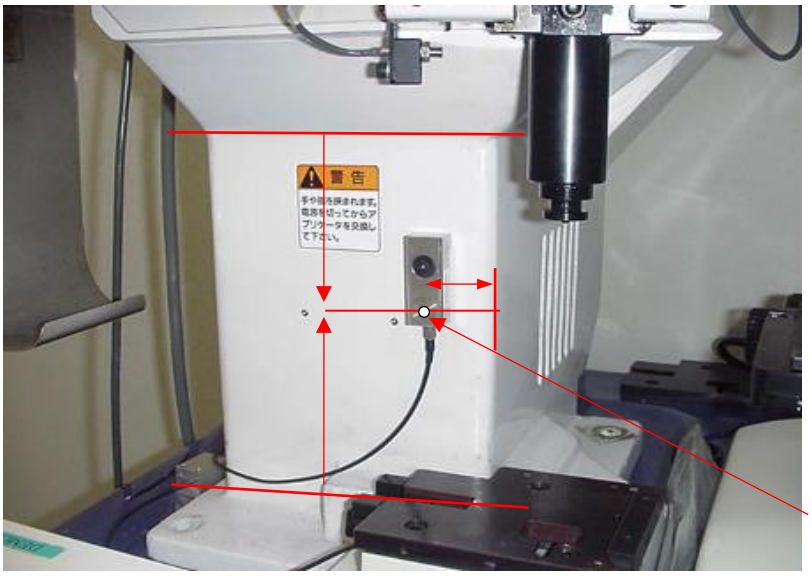
2.3. PSS sensor installation

How to install PSS sensor is described here. PSS sensor detects elongation of the crimping machine body when the terminal is crimped. Therefore, the correct position for putting on the machine is needed.

2.3.1. How to set on the machine : example

The correct setup position depends on the machine design. Basically, the sensor should be setup just behind the applicator, vertically central, horizontally 10 – 20mm from the side of applicator (right or left). If behind the applicator is not available due to different object there, the side is also available, vertically central, horizontally 10 – 20mm from the front. Electrical insulation sheet for PSS sensor is available in case there is electrical leakage on the machine body to prevent electrical noise problem. See “3.4. Electrical insulation sheet for PSS sensor” for more information.

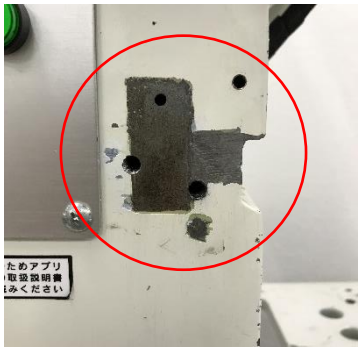
Example : C-frame type



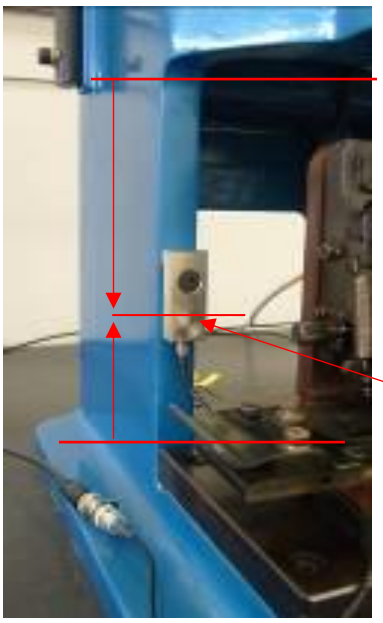
The element position detecting the strain

In many cases, C-frame crimping machine has the biggest-elongation area is behind the applicator (front side). Central of vertical direction, horizontal position should be 10mm – 20mm from the side of the machine ram. Normally no need to peel the paint of body surface, however, if more sensitivity is needed like standard PSS50 can get so small force curve, you can peel the paint to get more sensitivity.

Example of peeling the paint



Example : Straight-side frame



For Straight-side frame, you can setup the sensor right or left column either one is fine. Setting up the sensor on the side where CFM-Lite main unit is put makes easy wireing work. The sensor position is vertically central of the column. Normally no need to peel the paint.

The element position detecting the strain

2.3.2. Procedure of setup the sensor

Punch

Drilling machine

Tap handle

Drill tool
3.3mm, 5.0mm

M6 tap tool

1. Tap on the machine for setting up the sensor. Prepare these tools and parts.

Cleaning cloth 2-3 pcs.

Alcohol for cleaning

PSS sensor with M6 screw

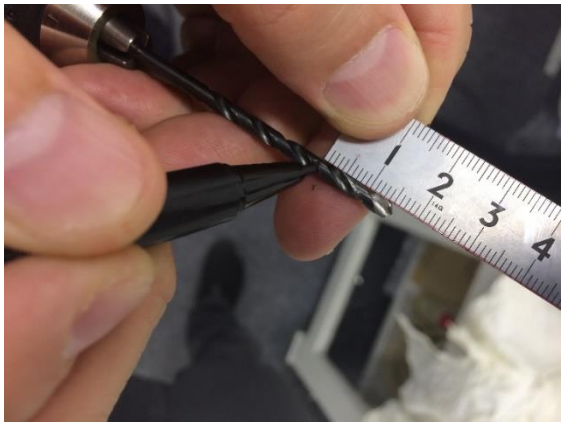
2. Mark on the machine where to make a hole by punch.

3. Such mark is made.

4. Make a pilot hole by 3.3mm drill. Set 3.3mm drill tool to the drilling machine and fix it rigidly not to fall out during rotation.

5. Spread clothes to receive the scraps prod

6. Mark on the drill tool for seeing how far the drill is forwarding. Mark by pen or apply a tape 15mm from the tip. Forward the drill till reaching there.



7. Put the drill tip on the punch mark and make a straight hole. If the drill tilts, the hole tilts as well, it results in non-flat sensor position. Forward the drill till the mark on the drill tool made in 6.

8. Take out the 3.3mm drill tool and put 5.0mm drill. The mark on drill is not needed because there is a pilot hole.

9. Make main hole with the 5.0mm drill tool. Inert the drill into and along the pilot hole and rotate it and forward it, like just expanding it. Forward till reaching the end of the hole with feeling like “bump something hard”. Then, remove the drill.

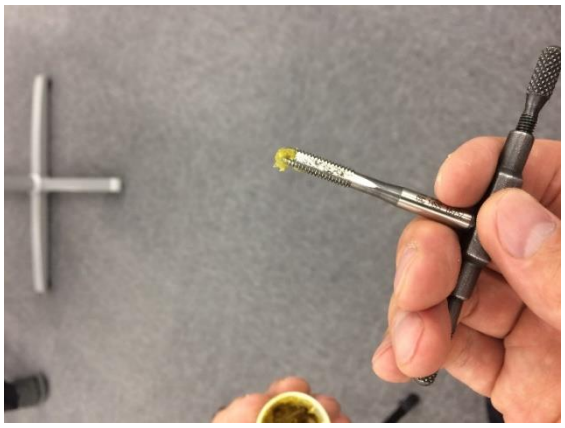
10. Wipe the hole and around it with the cloth. If you have air gun, use it to blow scraps. While using it, be careful not to splash them, it is better to cover with cloth while blowing.

11. Prepare the tap handle and tap tool of M6.

12. Put the M6 tap tool to the tap handle.

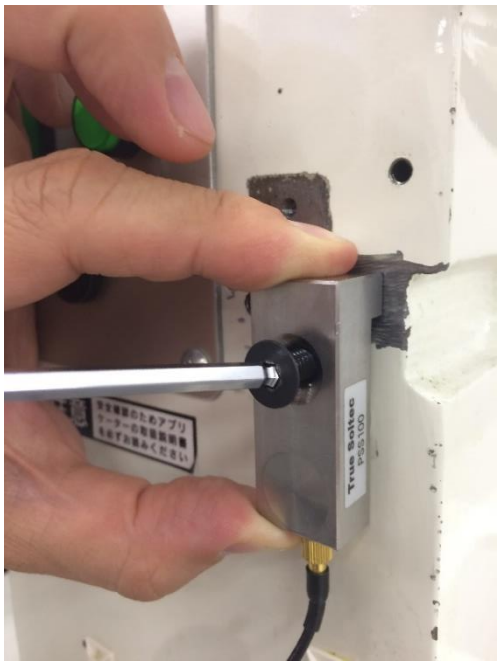
13. Put the grease on the tap tool to lubricate it.

14. Example of greasing.

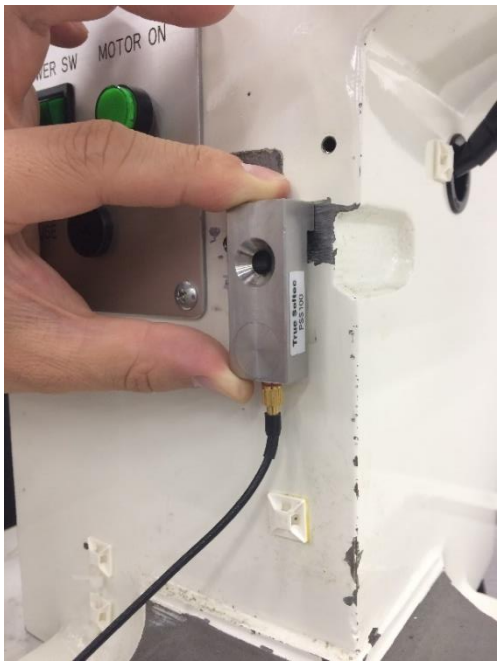


15. Put the tap tip into the hole to tap it slowly in a clockwise direction. Be careful not to tilt it. After the tap is forwarded straight and the direction is fixed, move it forward till the end. Not to break the tap tool, sometimes release the load applied on it by turning it in a counterclockwise direction. When it hits the end of the hole, you feel “stuck” force, it can’t move forward more. Then the tapping process is finished. Remove the tap tool in counterclockwise direction.

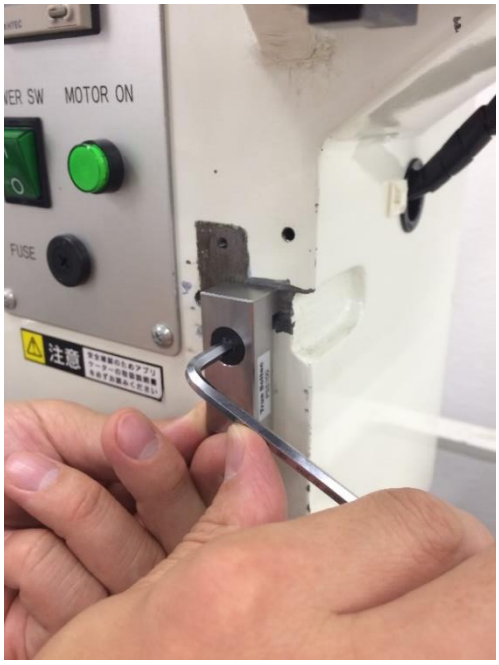
16. Wipe the hole and around it with the cloth. If you have air gun, use it to blow scraps and grease. While using it, be careful not to splash them, it is better to cover with cloth while blowing.



17. Set up PSS sensor with M6 screw in a direction as shown in the picture. The vertical direction (up/down) can be opposite depending on the wiring way. It can't be set horizontally (right to left) because it can't detect the elongation. The paint on the body surface doesn't have to be peeled, however, depending machine model or PSS sensor model, it does, due to low sensitivity which can't obtain correct force data.



18. Fix the M6 screw by hex wrench. Only a screw is needed to fix PSS sensor.



19. Sensor is designed to fix with 7N – 10N force which requires torque wrench if correct force is given, however, just fixing with the hex wrench rigidly is enough setting up PSS sensor, if there is no torque wrench. It is no problem if you cannot move the sensor after fixing. When applicator or other tool hits the sensor, sensor should be enough strong not to change the position.

20. Setup work is finished.
The picture is example that the paint is peeled.

2.4. Wiring of interlock signal (Stop signal) for the machine

When CFM-Lite judges the result as defect, or when it is in Parameter screen or Tolerance setting mode, the crimping machine must be locked to stop the production as interlock. For manual crimping machine, in most cases, foot switch is used. Therefore, how to lock foot switch is described here. The crimping machine used in pictures here is an example. How to connect the stop signal and wiring depends on the machine model.

Cable stripper

Terminal crimping tool

Nipper

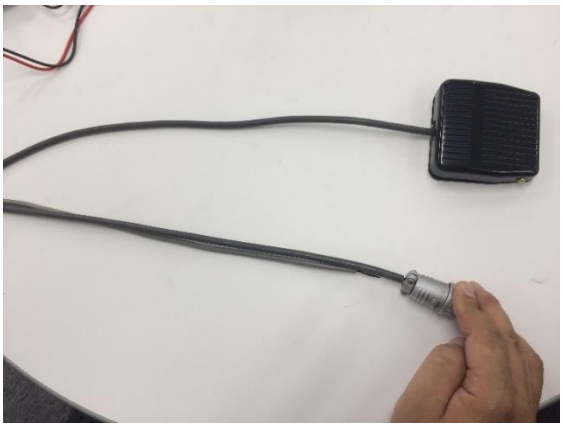
Male terminal

Female terminal

1. Prepare these tools and parts for wiring to foot switch and the machine.

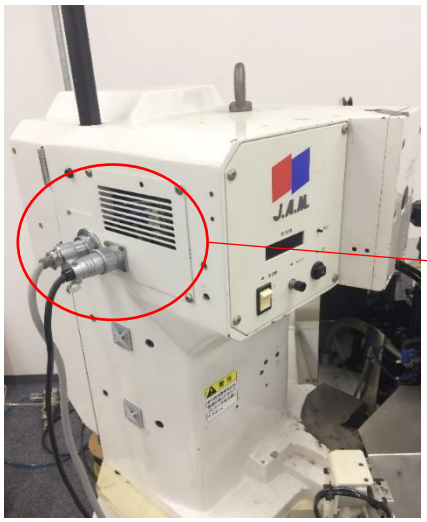
I/O cable
(D-sub 9 pin)

Electric multimeter



2. A foot switch use for the machine.

3. Connect the stop signal of I/O directly to cables of connector of foot switch (circled in red below) inside the cover. This is easier to wire than connecting to cable of foot switch outside the machine.



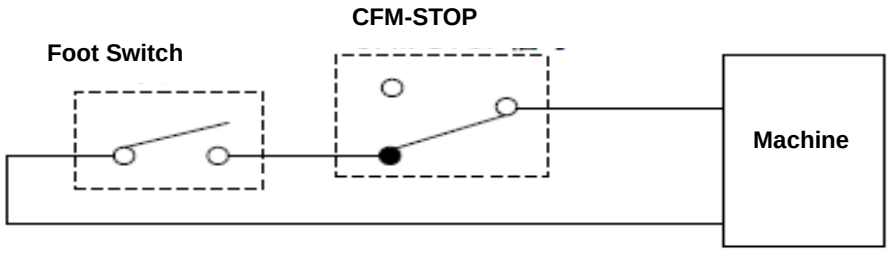
4. This is the connector of foot switch.

5. Press foot switch to turn ON the contact of foot switch. This is the same status when stepping foot switch.

6. Touch the connector with multi meter to check to which cable the stop signal should be connected.

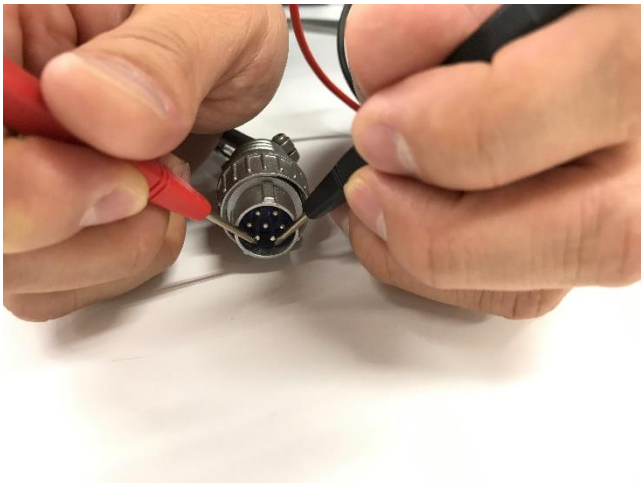
Reference picture

Connect the stop signal in series between foot switch and the machine.

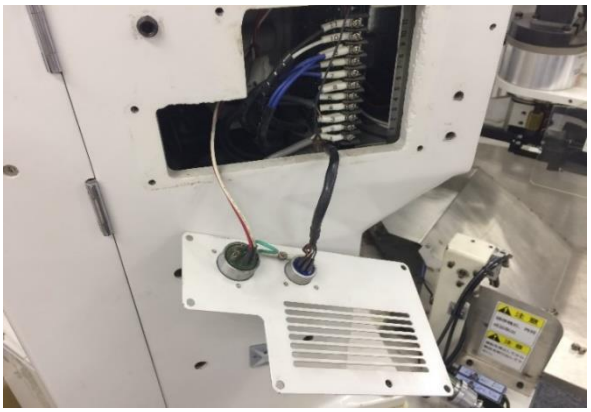


7. An electric multimeter. Turn the mode to resistance measurement.

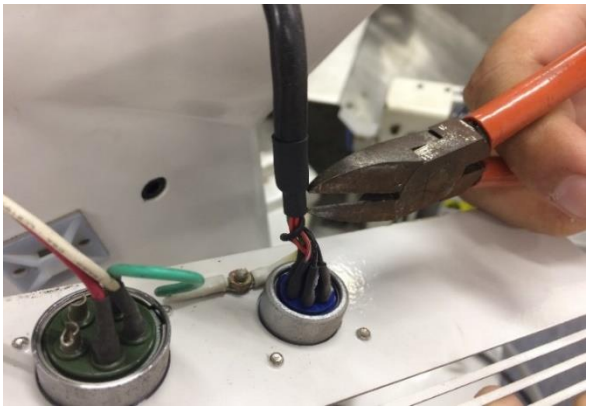
8. Touch each pin of connector of foot switch by using red and black probes, each probe red and black touchs one pin each, 2 pins at a time. If the multi meter screen shows “000.0”, these 2 pins conduct. There are the following 3 combinations in the foot switch pins. A) conducts when foot switch contact is ON, B) conducts when foot switch contact is OFF, C) don’t conduct neither A) or B). The pin conducts both in A) and B) is COMMON (COM). Interrupt the stop signal to COM.



9. Pick up a pin from the machine side corresponding to the one from foot switch side

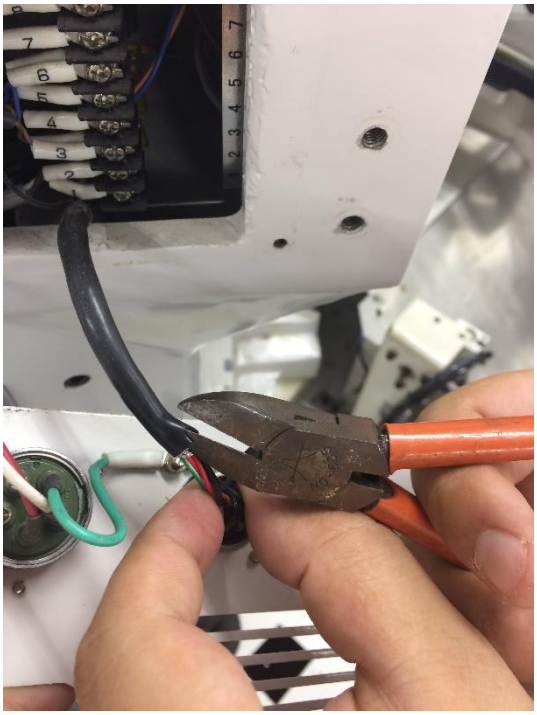


10. Take out the cover of the machine.

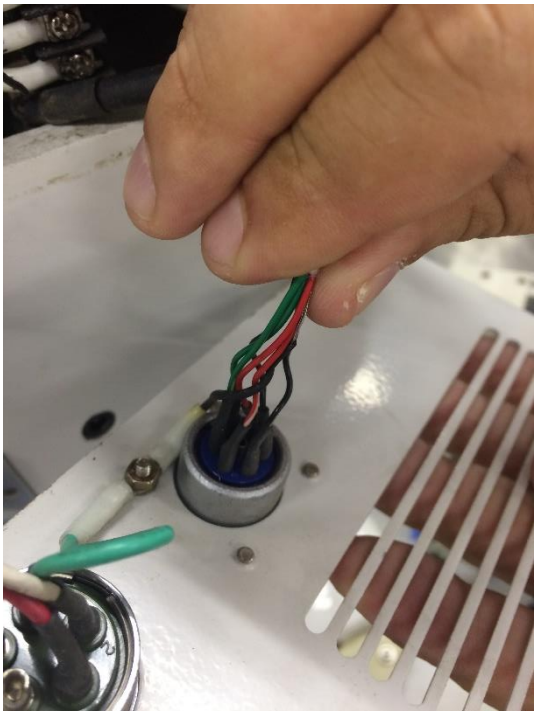


11. Cut the wire corresponding to COM inside the cover.

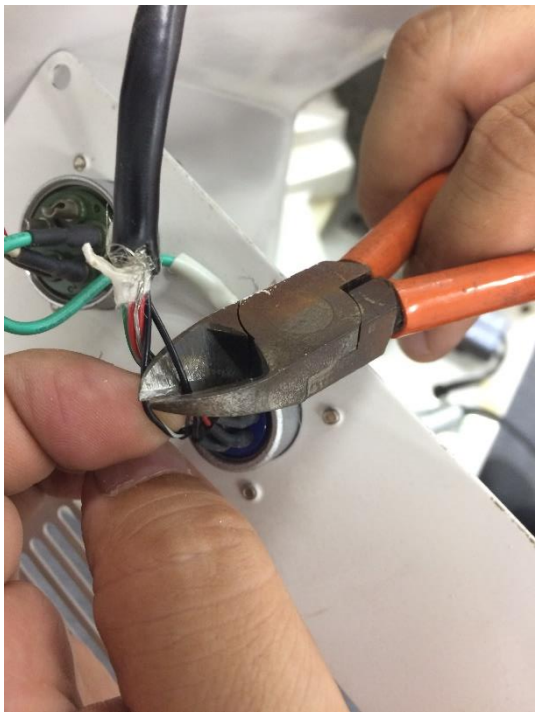
12. If there is heat shrinkable tube, cut and remove necessary length of



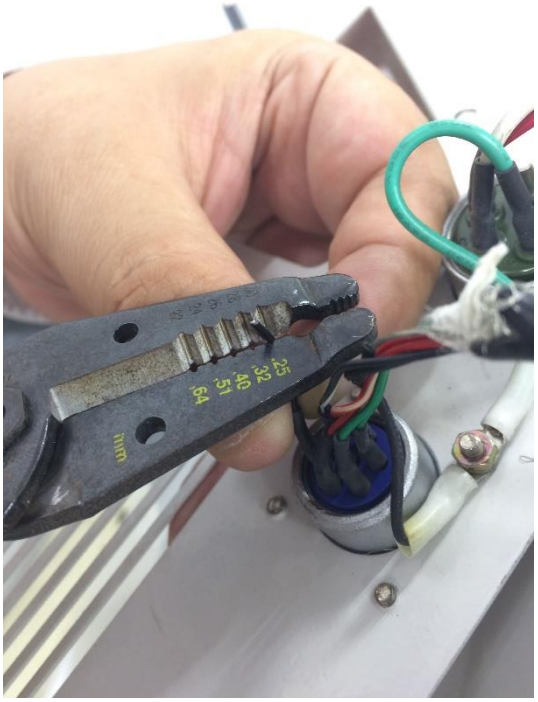
13. The heat shrinkable tube is cut and opened.



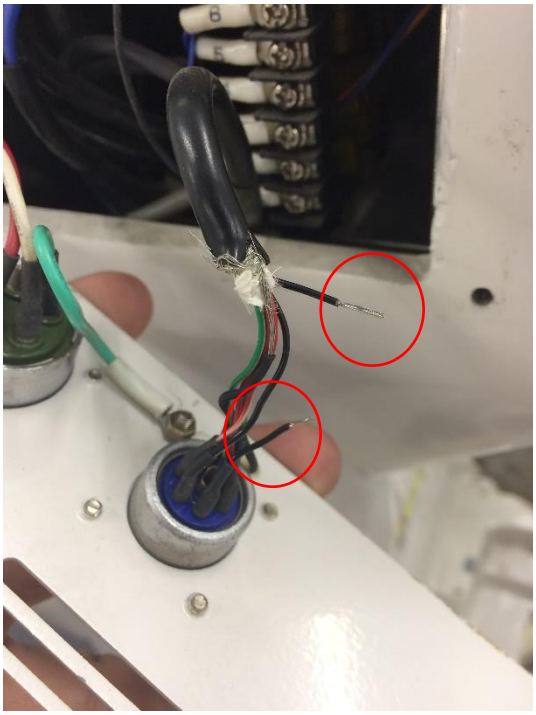
14. Cut the cable of COM.



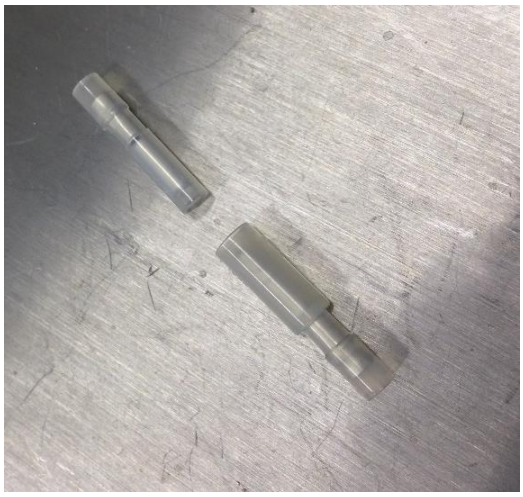
15. Strip the insulation of both end of the cut cable by cable striper.



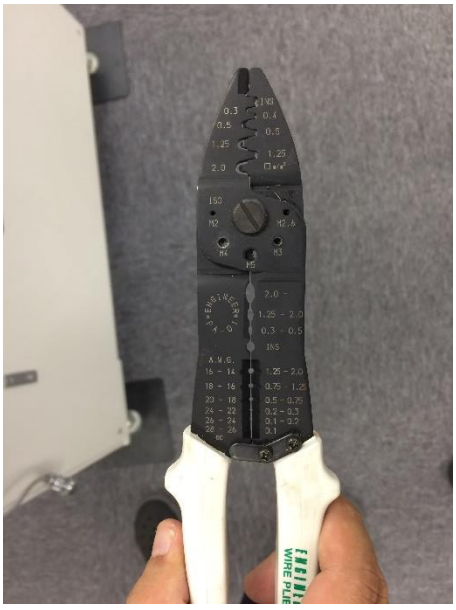
16. The both ends of the cable were cut and stripped.



17. Prepare male and female terminals.

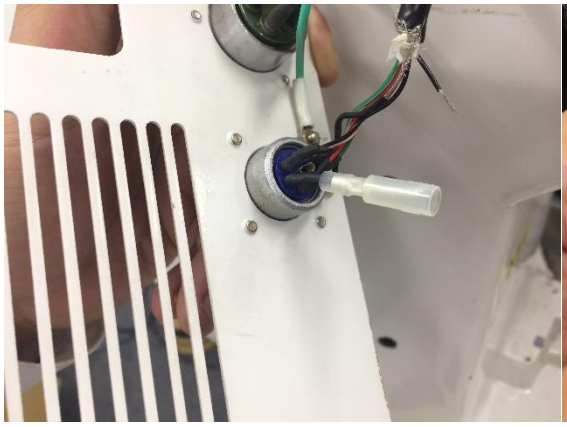


18. Prepare terminal crimping tool.

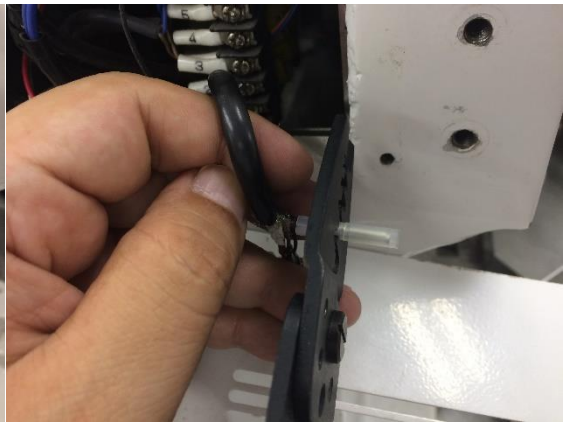


19. Crimp male terminal on the stripped cable of the cover side by terminal crimping tool.

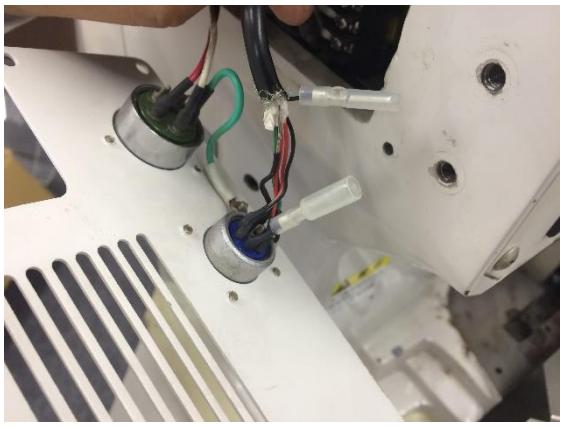
20. The cable of COM in the cover side is crimped with male terminal.



21. Crimp female terminal on the other side of COM cable.



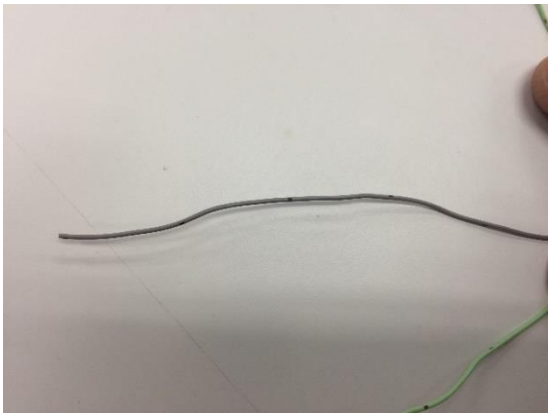
22. Male and female terminals are crimped



23. Prepare I/O cable.

24. Pick up a green cable with 1 red dot (COM) from separated tip of I/O cable. There is a red dot on green cable.

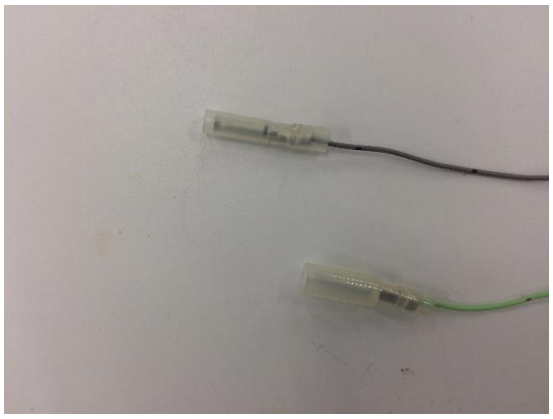
25. Pick up a gray cable with 1 black dot (NC) from separated tip of I/O cable. There is a black dot on gray cable.



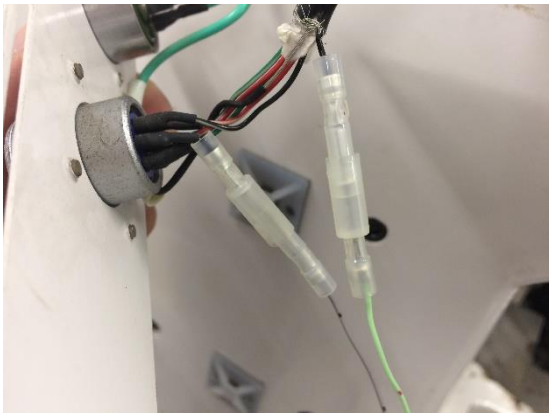
26. Strip cables of COM and NC by cable stripper.

27. Crimp terminals with terminal crimping tool. Male terminal for COM, and female terminal for NC. Male and female ca be opposite.

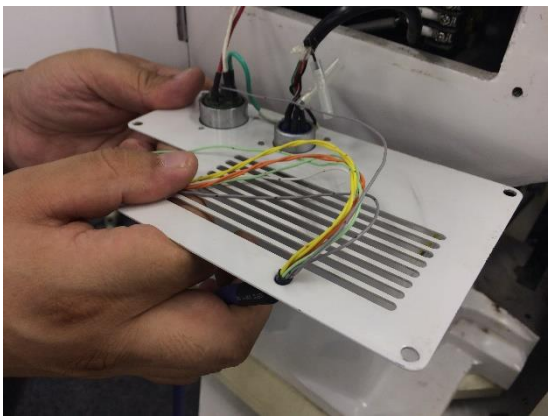
28. Terminals are crimped on COM and NC cable of I/O cable.



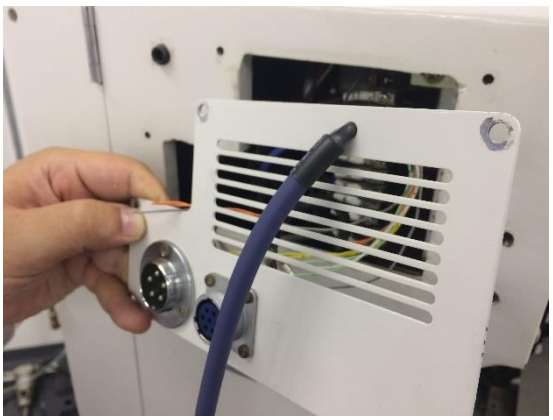
29. Connect COM and NC from I/O cable crimped in 26 to the terminals of COM of foot switch in 22.



30. Take out I/O cable of CFM-Lite through a hole or a gap.



31. I/O cable is taken out the cover. Wirng of the stop signal is finished.

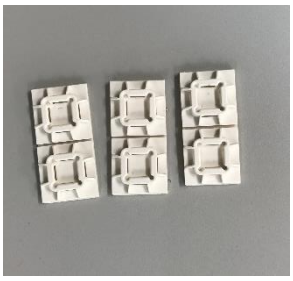


2.5. Lay out of the cables of sensor and I/O.

The cables of PSS sensor and I/O cable that are wired in “2.3. PSS sensor installation” and “2.4. Wiring of interlock signal (Stop signal) for the machine”. The crimping machine used in pictures here is an example. How to connect the stop signal and wiring depends on the machine model.

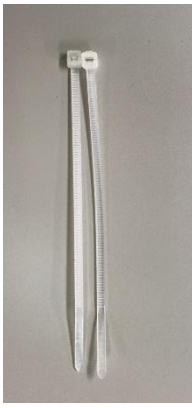
Cleaning cloth 2-3 pcs.

Alcohol for cleaning



Insulation lock base

1. Prepare these tools and parts necessary for laying out cables.



Insulation lock

I/O cable

BNC cable

2. Drop alcohol on the cloth.

3. Fix the cable of PSS sensor by insulation lock. Put insulation lock base on the machine body as shown in picture.

4. Stick necessary number of insulation lock base to lay out the cable.

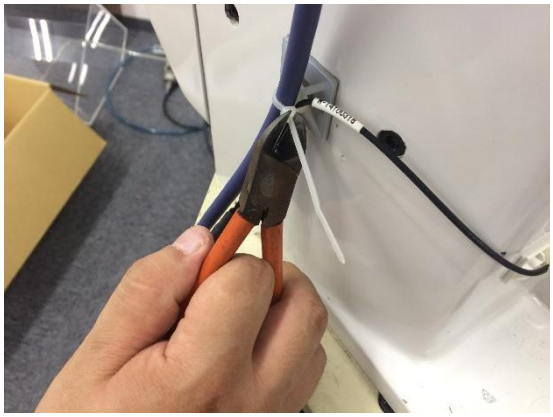
5. Fix the cable by passing insulation lock through the base as shown in picture.

6. Cut excess part of insulation lock by nipper.

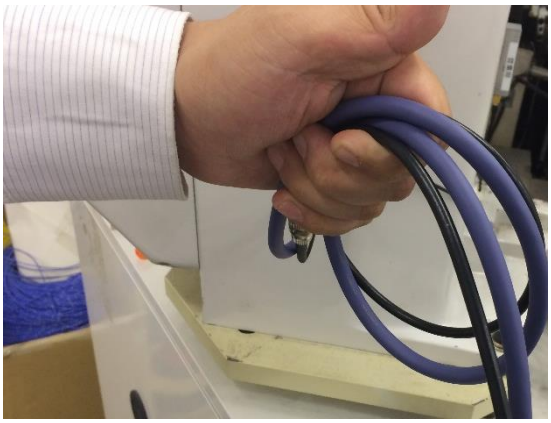
7. The cable of PSS sensor is laid out is finished.

8. Bind up the cable of PSS and the cable of I/O wired to the machine in “2.4. Wiring of interlock signal (Stop signal) for the machine” by insulation lock.

9. Cut excess part of insulation lock by nipper.

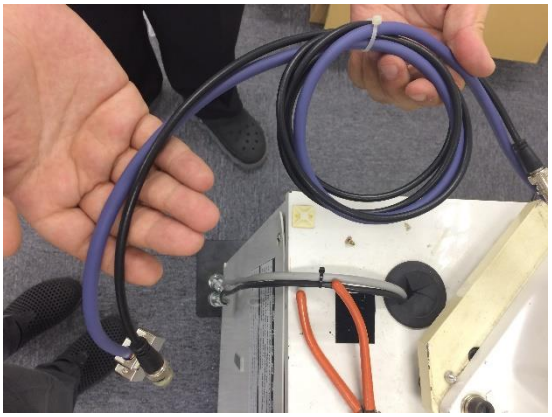


10. Connect the cable of PSS and BNC and make round together as show in picture.



11. Bind up these 2 rounded cables by insulation lock.

12. These 2 cables are ready to connect to CFM-Lite main unit.



2.6. How to set up mounting bracket for the main unit

The CFM-Lite main unit is designed to be attached on mounting bracket. The mounting bracket is packed in the box. How to set up the bracket is described here.

Punch

Drilling machine

Tap handle

Drill tool
3.3mm, 5.0mm

M5 tap tool

1. Prepare these tools and parts to set up mounting bracket.

Cleaning cloth 2-3 pcs.

Alcohol for cleaning

Mounting bracket main bar

M5 x 25 black cap bolt 2 pcs.
M5 flat washer 2 pcs.

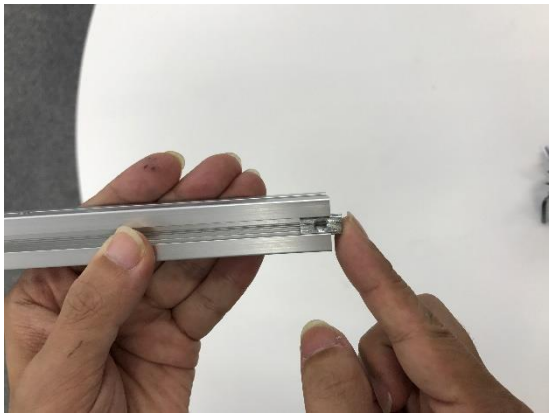
Triangle base plats 2 pcs.

M5 x 10 black cap bolt 4 pcs.

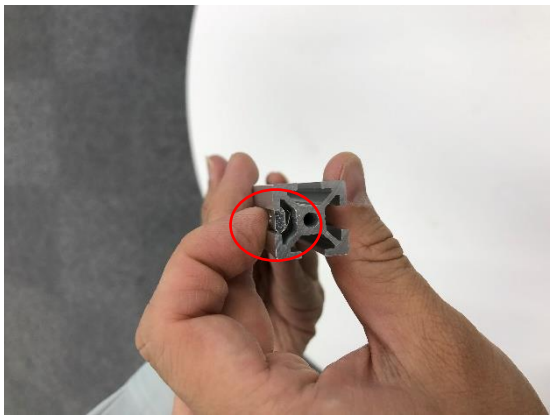
M5 after nut 2 pcs.

2. Prepare mounting bracket main bar.

3. Inert M5 after nut to the main bar



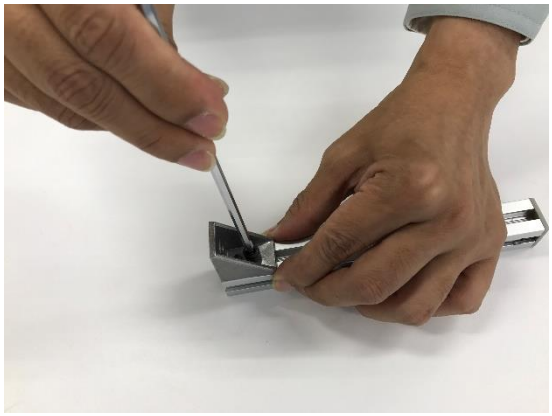
4. Adjust plate spring of after nut during insertion to put it in the slit.



5. Attached the side with bump of the triangle base plate to the main bar for fixing it with M5 screw.

6. The side without bump of the triangle base plate is going to be attached to the machine body..

7. Fix the triangle base plate with M5 screw.



8. The 2 triangle base plats are set on the main bar.

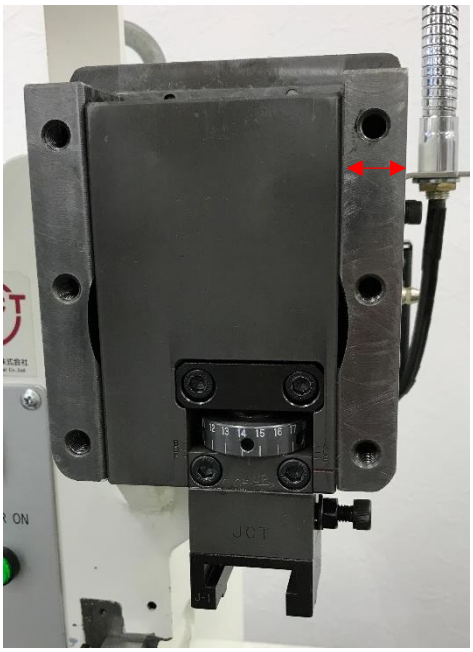
In the case of the machine in picture, open the holes in the right side (circled in red). Where to set up depends on the shape of machine. Also, check if there is no object around the holes, or important parts like cable or motor inside the body where the holes are.

Reference picture : example of mounting the main unit.

9. Make holes on the side of machine body for mounting bracket. The bracket should project out to the side.

10. Open the front panel of machine to check if there is no important parts inside the body where to make the holes.

11. The packed screws project 5.5m from the surface of triangle base plate. In the picture, the thickness of body where to open holes is enough thick, the packed screws don't penetrate.



12. Mark on the body by punch.

13. Mark at 5.5mm of 4.2mm drill with a pen to see how much the drill goes forward.

14. Move forward the drill till the mark on it. Be careful not to penetrate the drill to inside the body which can damage some parts.

15. Prepare M5 tap.

16. Tap on the holes.

17. If the body is not think and holes are so shallow, use anther tap without or less incomplete thread tip to lessen the incomplete thread part of the holes.

18. Wipe the hole and around it with the cloth. If you have air gun, use it to blow scraps and grease. While using it, be careful not to splash them, it is better to cover with cloth while blowing.

19. Set up the bracket with M5 x 10mm screws.

20. Set up the main unit by fixing M5 screw with M5 flat washer to the holes of rear side.

21. Mounting bracket and the main unit are set up.

2.7. How to install PC software

Product requirements

Available operating system (OS)	Windows7 (32/64bit)
Recommended specifications	CPU of Core-i5 or more : Memory of 2GB or more

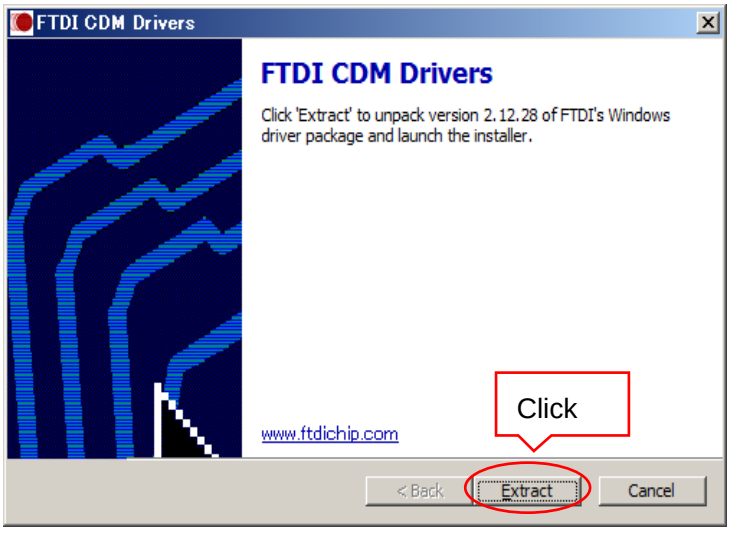
Copy and paste the following 3 installer files to the deskop of PC and run one by one in order.

Root folder of CD

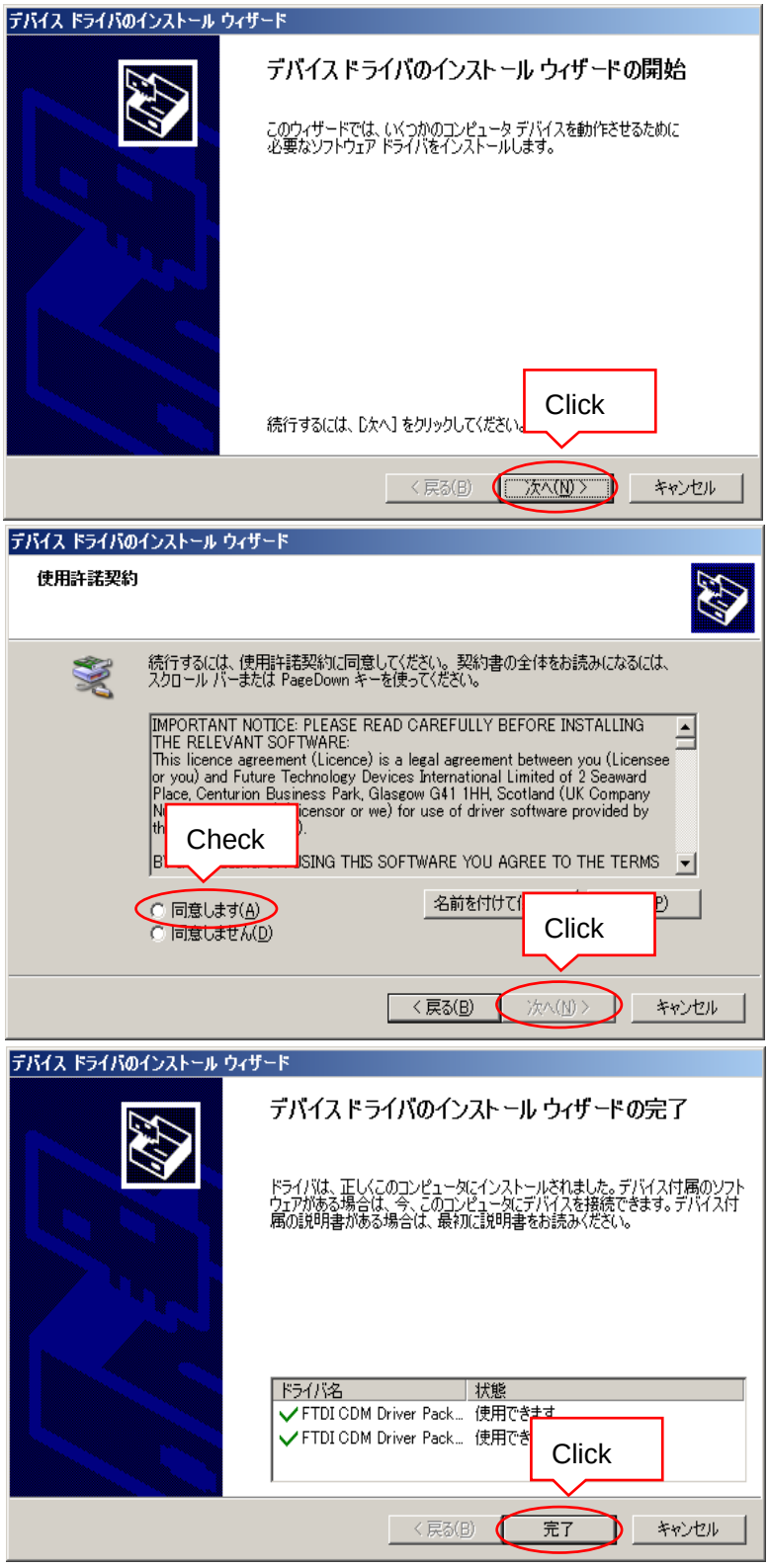
- 1.USB_Driver folder
  - CDM21228_Setup.exe
- 2.VB_PowerPack folder
  - VisualBasicPowerPacksSetup.exe
- 3.Pro-Lite_Setup folder
  - setup.exe

Run “CDM21228_Setup.exe “ in “USB_Driver” folder

Double click “CDM21228_Setup.exe” to run it.



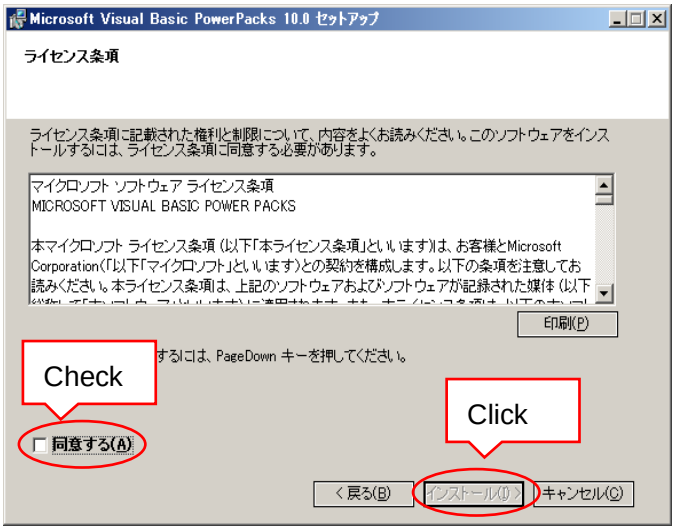
This screen is "device driver install wizerd", which is written in Japanese. This will be automatically adjusted to local launguage according to OS.

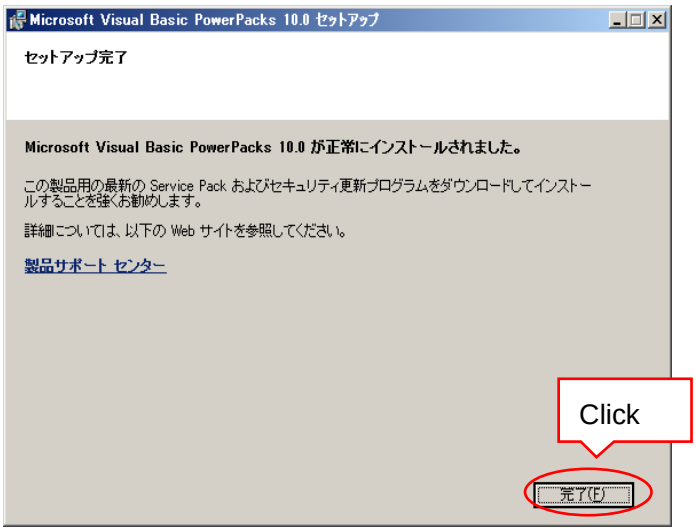


Setup of ”CDM21228_Setup.exe” of “USB_Driver” folder is finished.

Next, Run "VisualBasicPowerPacksSetup.exe" in VB_PowerPack folder.

Double click “VisualBasicPowerPacksSetup.exe”.

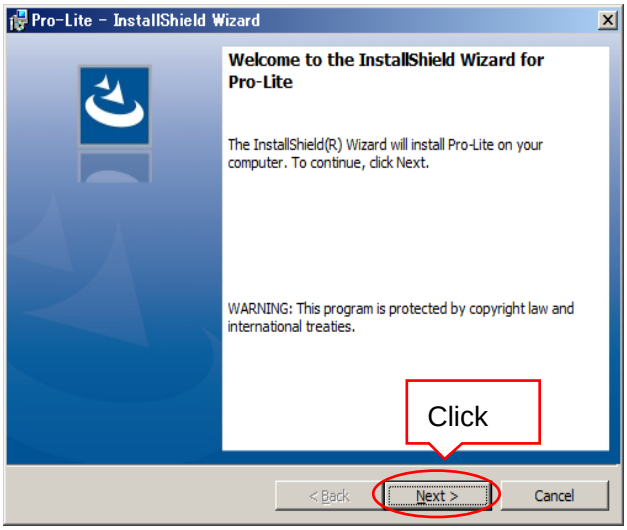


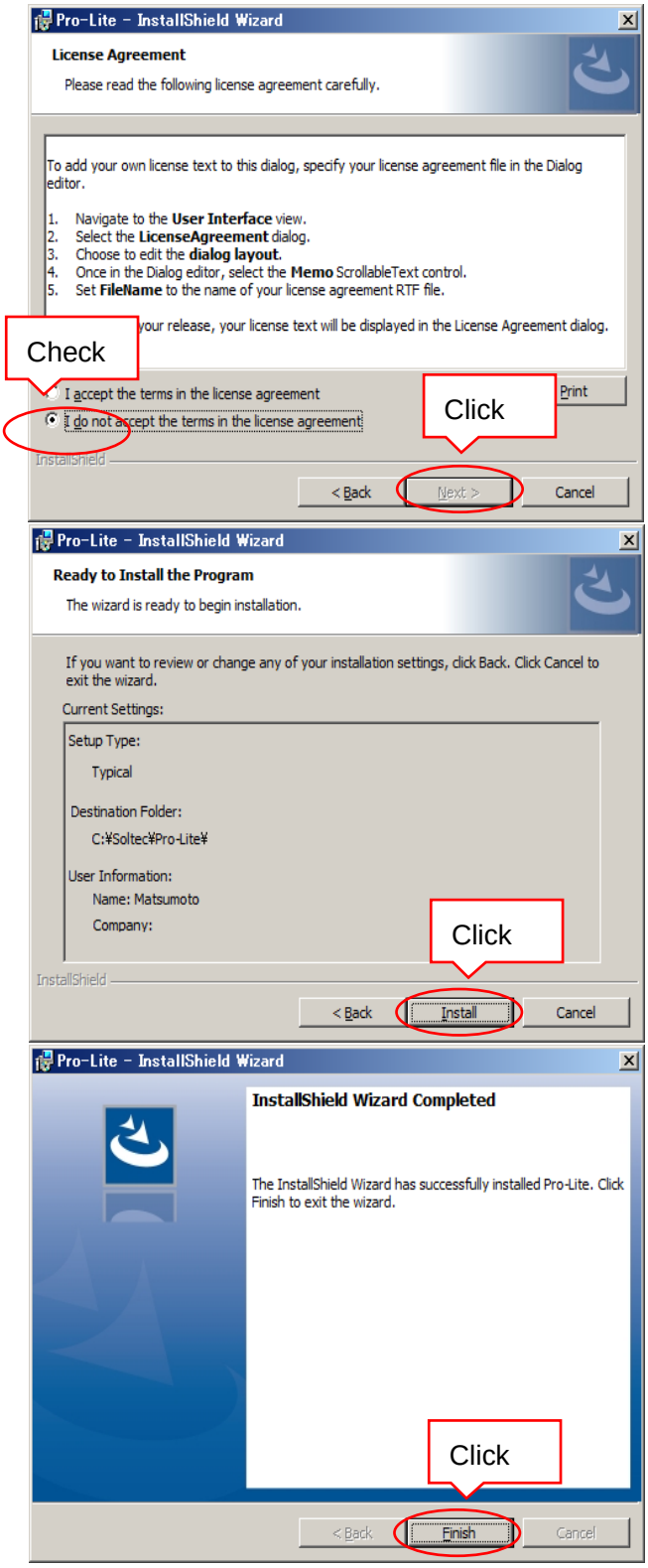


Setup of ”VisualBasicPowerPacksSetup.exe” in “VB_PowerPack” folder is finished.

Run “setup.exe “ in “Pro-Lite_Setup” folder

Double click “setup.exe”.





Setup of “setup.exe” in “Pro-Lite_Setup” folder is finished.

PC software Pro-Lite is ready to start.

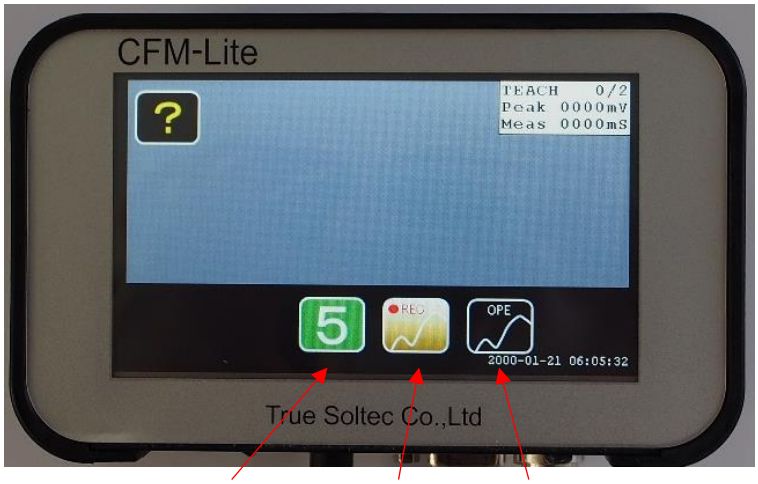
Click the icon of Pro-Lite appeared in the stat menu to start it.

2.8. Let's get started

With all setup procedure, CFM-Lite has been ready for used with production. Then, start it with the following process. CFM-Lite can be operated only by touching the main unit basically. There are 3 modes, OPE (operation/production), TEACH (obtain of the reference force curve), and Tolerance setting. Other than these modes, for changing parameters, open PC software Pro-Lite.

The main unit is turned ON.

After start screen, it automatically goes to TEACH screen, which obtains the reference force curve by sampling 2 good crimps. The 1st crimp in TEACH is not judged. The 2nd crimp is judged as good or defect by comparing with the 1st crimp. The set tolerance for OPE mode shown in the main unit screen is used in this process.



Tolerance button OPE button TEACH button

It automatically goes to OPE mode after getting the reference force curve. In OPE mode, you can perform producing the crimped terminal. At every crimp, the actual force curve is compared with the reference force curve to judge it as good or defect Good and bad count is up accordingly. If defect, an error screen is shown.

The error screen. The stop signal in I/O activates to lock foot switch. To unlock it, tap Reset button in the lower right corner, circled in red. Error is reset and you can step foot switch again.

Tapping tolerance button leads you to tolerance setting screen. You can choose appropriate tolerance from 1 to 5.

3. Other installation

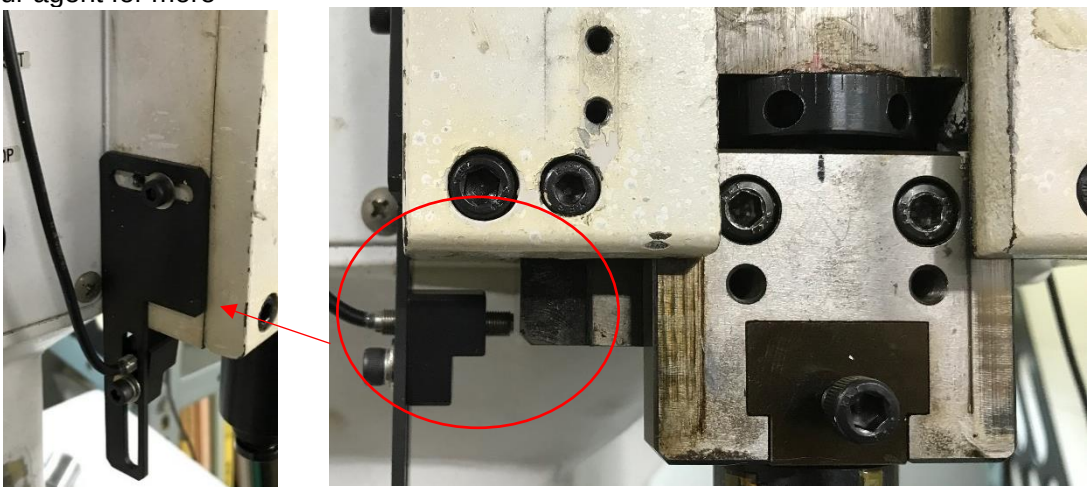
3.1. Proximity sensor installation

If correct force curve can't be captured with Auto Trigger, use an external trigger. In many cases, the proximity sensor is set near the machine ram to detect the ram is falling down as the start timing of capturing force. We are providing the proximity sensor of E2E-X1C1 of OMRON as standard.

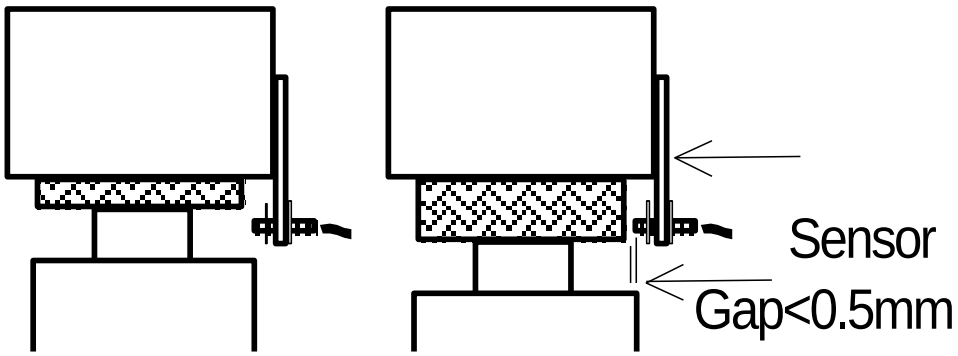
OMRON E2E-X1C1

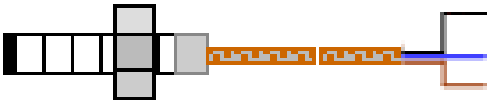
The proximity sensor is put on the machine with special holder. It needs M4 holes. Setting position and the bracket depends on machine model. Contact to us or our agent for more

Set the proximity sensor as shown below picture when the machine ram is set down to the lower dead point, so it reacts just before crimping process starts.



Example





oximity sensor Pin of the I/O of CFM-Lite

“signal” —— pin 1 : 24V(orange black dot 1)
“ground” —— pin 2 : External trigger(orange red dot 1)
n “power —— pin 9 : Ground (white black dot 1)
12-24V”

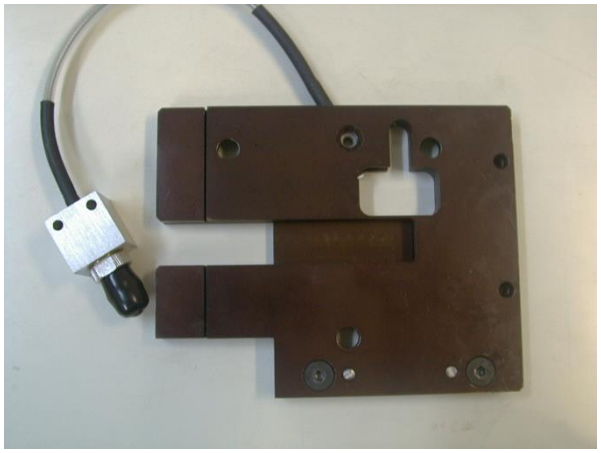
The proximity sensor head

With the proximity sensor provided by us, connect wires to the I/O of CFM-Lite as shown in above picture.

3.2. Base plate and sensor preload

FTW series sensor is set in the special base plate.

Special base plate



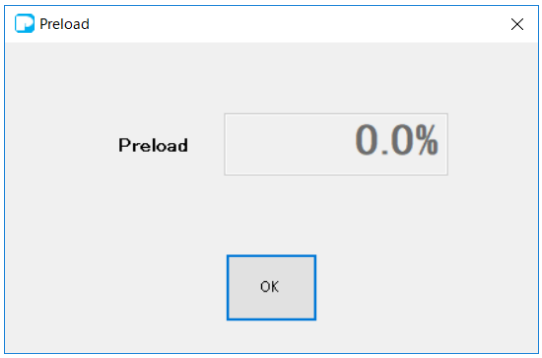
The sensor is sandwiched by the upper and lower plates “sandwich type”, designed to place the sensor as near to the machine ram as possible with considering the position of scrap hole.

Section view FTW sensor

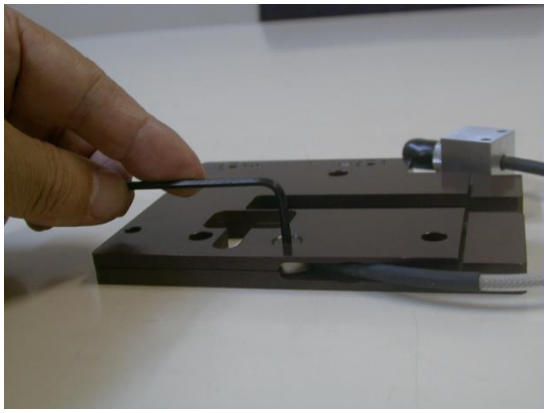
Fixed by M4 set screw

Preload the sensor with M4 screw after setting it with the PC software Pro-Lite.

The preload screw in the PC software. The number of preload in % is being shown.



Fix the set screw till the % of preload screen reaches to 10 – 20%. Then the base plate is ready to use. Appropriate % of preload depends on sensor and base plate type.



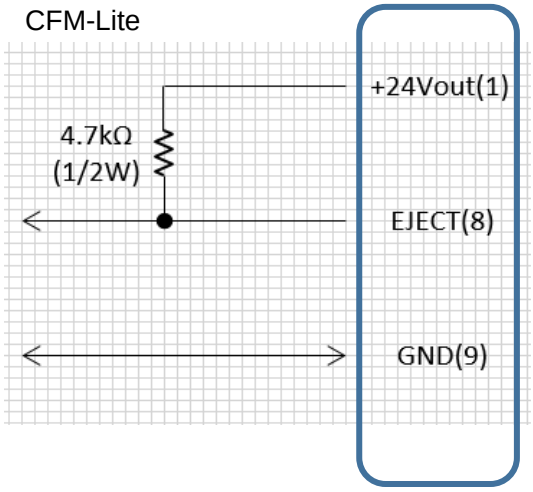
3.3. Eject signal connection

Eject signal is a signal confirming that the crimp is finished sent to the machine every good or defect crimp. This is mainly used with semi-automatic crimping machine, outputs 100ms pulse one time. Pin 8 (Eject) and 10(GND) are not short-circuited (High), it is short-circuited (Low) during outputting the Eject signal, for 100mSec. After that, it returns to non-short circuited status (High). See “1.5 Input and Output” for more information.

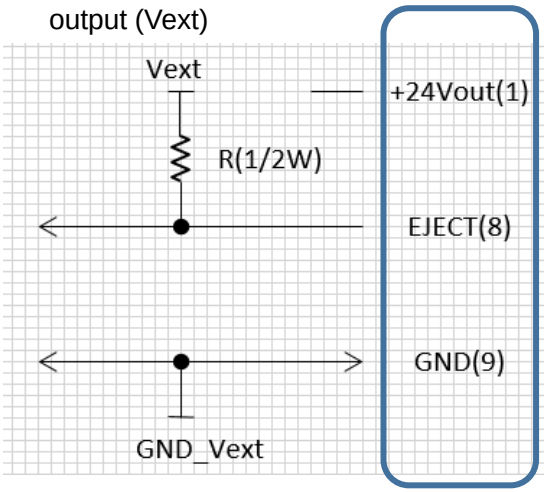
Example of connecting to the machine

CFM-Lite uses open drain output for the Eject signal output.

In the case of using +24V of the I/O of CFM-Lite

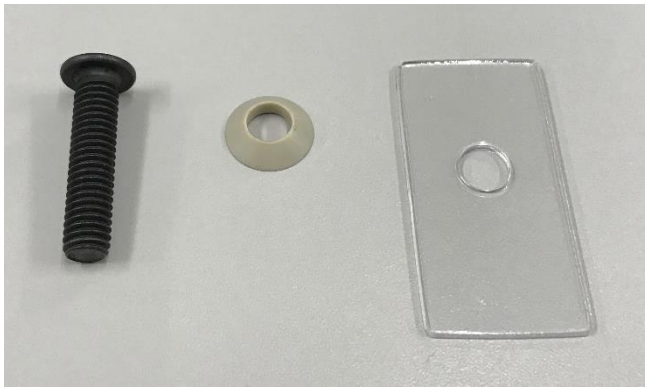


In the case of using an external output (Vext)



3.4. How to set up the insulation plate for PSS sensor.

If the power is not earthed, there is electrical leakage on the machine body, or there is sudden surge voltage, the insulation plate for PSS sensor works to prevent them. This is an optional item. Contact to us or to our agent.



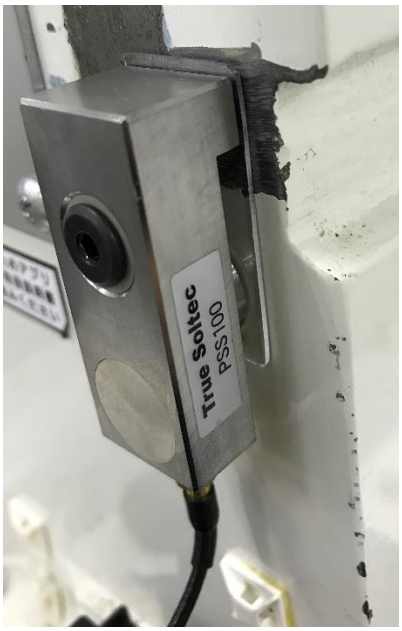
Prepare special insulation plate for PSS sensor, screw, and collar.

Insert the collar to the screw.

Insert the screw to the hole of sensor.

Put the insulation plate on the sensor bottom facing to the machine.

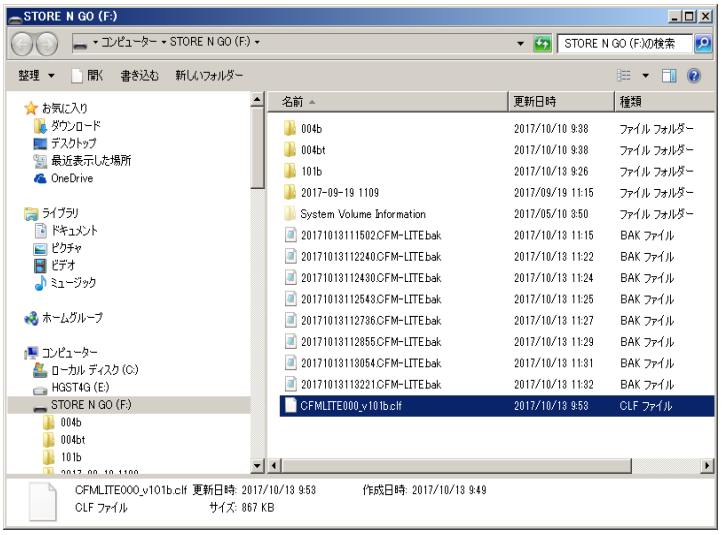
Put the screw through the sensor and plate as shown in the picture.



Set on the machine body. It can prevent the trouble caused electrical problem, however, the plate interrupts the transmission of strain. PSS sensor sensitivity gets lower around by 50%. Check if there is no effect capturing the force curve and judgement.

3.5. How to upgrade the program of main unit

For updating the program of main unit, called firmware (FW), by using USB memory.



1. Copy the latest firmware with file type "clf" to root folder of USB memory. (In the below example, this is named "CFMLITE000_v101b.cfl".
remarks : It must be put in the root folder.
remarks : Put only one clf file in the root folder. If there is another clf file, CFM-Lite can not be updated its firmware. You can put different type file (non-clf) or folder there.

2. Start CFM-Lite

USB icon

3. Insert USB memory to CFM-Lite. Once USB memory is recognized, USB icon is shown at the lower right.

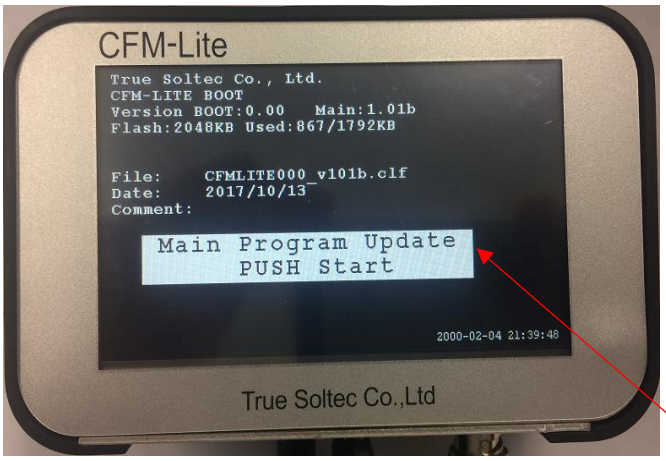
USB memory

4. Tap the "?" icon at the upper left to show the help screen shown below.

5. Keep pressing the large letter "T" of the log of True Soltec at the upper left in the help screen, for 3 seconds.

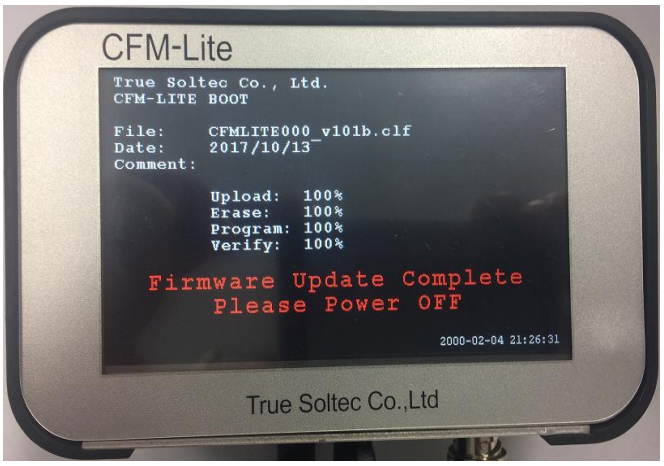
6. After pressing, release your finger. A message "Main Program update PUSH reboot" is shown in the middle of the screen. Tap the message.

Tap



7. Black and white screen is shown. A message "Main Program update PUSH start" is shown. Push the message.

Tap



8. Wait till upload, erase, program, and verify reach to 100%. Until then, do not turn off the power.

9. After all reaches to 100%, a red message "Firmware Update Complete Please Power OFF is shown. Then, pull the USB memory out, turn off the power, and turn of again.

Version number

True Soltec Co.,Ltd.
Suna 906-5, Kawagoe-city, Saitama 350-1133 Japan
TEL +81-49-242-9184
FAX +81-49-242-3190
URL http://www.truesoltec.co.jp/
E-mail info@truesoltec.co.jp