

Manual for External Batch/Screw Counter (NEX-PLC) for Screw Feeder FM-36

1. Summary

This counter can interface with Screw Feeder FM-36 by setting the number of batches/screws, to be fed, directly into this device or else from a PLC.

2. Specifications

2. 1 Product specifications

Power supply	AC adapter DC24V 1.9A (AC100V~240V)
Operating environment	Input 8 points / Output 8 points I/O terminal
Dimensions	155mm×113mm×44mm

2. 2 Parts description

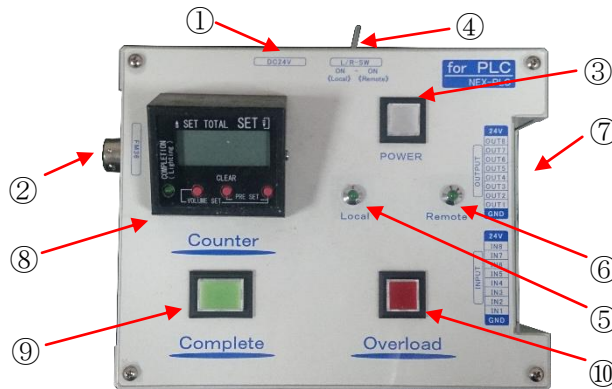


FIG1. Machine features

- ① [DC24V] : Power supply connector (Marushin Electric Mfg : MJ-20)
Input terminal for power supply: DC24V.
Synchronized ON/OFF power with the FM36 screw feeder connector.
24V and GND on the terminal block are Output terminals.
- ② [FM36] : Interface connector (Tajimi Electronics : PRC05-P8F)
Cable connection to screw feeder.
- ③ [POWER] : LED
Light indicates when power is ON.
- ④ [L/R-SW] : Changing switch
Choose between Local Mode or Remote Mode.
Choose the mode when the power is OFF.
Local Mode: feeds the number of screws set directly on the counter.
Remote Mode: feeds the set number of screws set using an external signal .

- ⑤ [Local] : LED
Light indicates Local Mode.
- ⑥ [Remote] : LED
Light indicates Remote Mode.
- ⑦ [INPUT]&[OUTPUT] : Input & Output signal terminal block(Omron : XW4E-10B1-V1)
Can be used on Remote Mode with an external device such as a PLC.
- ⑧ [Counter] : Indicator
Displays the number of screws the feeder is to supply.
Each mode has a different display. Confirm with the respective descriptions.
- ⑨ [Complete] : LED
Light indicates when feeding the set number of screws is completed.
- ⑩ [Overload] : LED
Lights indicates when the screw feeder is overloaded and stopped.

2. 3 Input & Output signal terminal block



FIG 2. Input & Output signal terminal block

- [INPUT] Terminal specifications
 - [24V]: DC24V Output terminal
 - [IN1]: Input terminal for starting signal of screw feeding
 - [IN2]: 1st bit input terminal
 - [IN3]: 2nd bit Input terminal
 - [IN4]: 3rd bit Input terminal
 - [IN5]: 4th bit Input terminal

[IN6]: 5th bit Input terminal

[IN7]: 6th bit input terminal

[IN8]: 7th bit Input terminal

[GND]: Ground (0V Output) terminal for [24V]

Confirm with Appendix 1 on how to set the number of screws to be fed as well as IN2~8 signals.

- [OUTPUT] Terminal Specifications

[24V]: DC24V Output terminal

[OUT1]: Output terminal for Request signal of Starting signal for screw feeding.

※2 seconds after screw extraction, the output signal changes.

[OUT2]: Output terminal signaling the set number of screws are to be extracted.

※For at least 2 sec., the output signal indicates Low output.

[OUT3]: Output terminal signaling the set number of screws are to be extracted.

[OUT4]: Output terminal for the 1st request of the starting signal after the power is turned ON.

[OUT5]: Output terminal signaling the screw feeding operation.

[OUT6]: Output terminal for the 2nd or later request of the starting signal after the power is turned ON.

[OUT7]: Output terminal for the overload and stopped signal.

[OUT8]: Output terminal for the extracting error and stopped signal.

[GND]: Ground (0V Output) terminal for [24V]

- Internal circuits

The internal circuits for both the INPUT and OUTPUT terminals are described below in Figures 3 and 4.

In FIG 3 & 4, 24V and GND are [24V] and [GND] terminals.

[24V] and [GND] on INPUT and OUTPUT use their respective terminals.

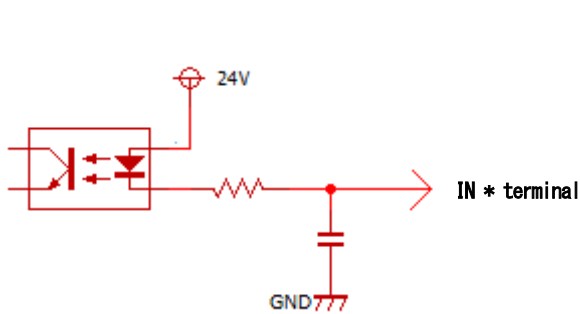


FIG 3. [IN*] terminal

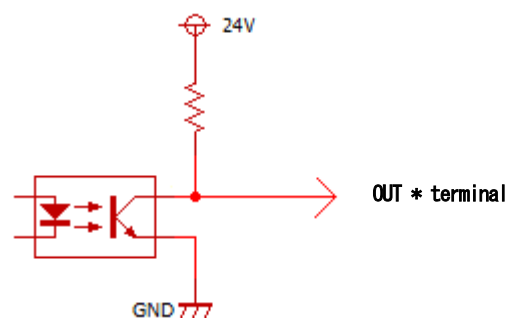


FIG 4. [OUT*] terminal

3. Operations

3.1 Local mode

- Operation sequences

When the set number of screws are extracted from the feeding site, another set is delivered.

- Counter display and operation

On Local Mode, the counter displays as in Fig. 5.

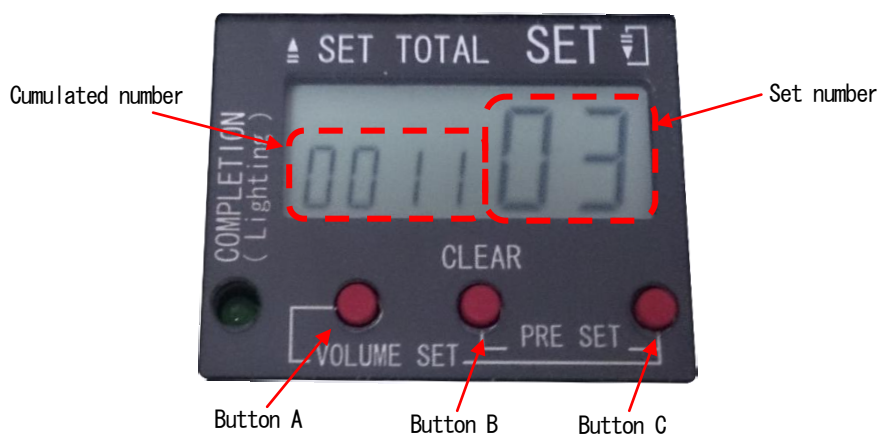


FIG 5. Counter display on Local Mode

The right side of the display is the set number of screws to be fed.

When screw feeding starts, the number counts down.

The left side of the display is the cumulated number of times the set number has been fed.

① Clearing the cumulated number counter.

Push Button B continuously until the number returns to "0000".

② Setting the number of screws to be fed.

When the cumulated number counter is at "0000", push Button B until the tens digit is flashing, then every push of Button B changes the tens digit number.

Push Button C until the single digit is flashing, then every push of Button C changes the single digit number.

③ Buzzer Volume Setting

Push Buttons A and C together until the display changes to "bu". (see Fig. 6)

Next push Button C only, to increase the volume from "00 ~ 03".

The displayed buzzer volume number is set and then the display will return to normal.

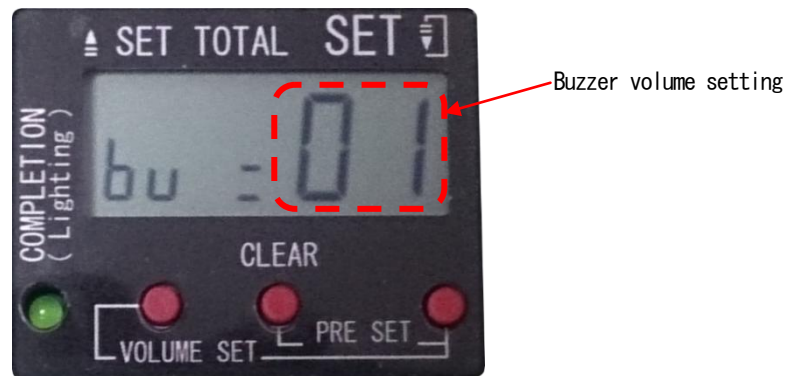


FIG 6. Counter display when the buzzer volume is being set. (note "bu")

3. 2 Remote Mode

• Operation sequences

Refer to Timing Chart 1 (page 9) for details of the operation.

Check the level of electricity, of the feeding operations, on OUT1 & 2.

Check the condition of the feeder on OUT3 & 8.

• Counter display and operation

Detecting a starting signal resets the counter to (00).

When screws are fed, the counter increases to the set number.

On Remote Mode, you can't clear the counter with the buttons, but can change the buzzer volume.

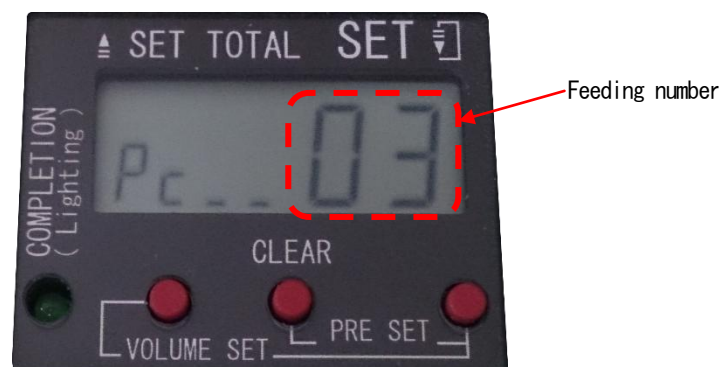


FIG 7. Counter display on Remote Mode (note "Pc")

4. Abnormal stop

4. 1 Irregular extracting stop

When screws are taken out before the set number of screws are fed, the machine decides it's an irregular extracting, and it stops feeding.

On Remote Mode, after detecting an irregular extraction, OUT8 changes from HI output to Low output.

Restarting operations are different for each mode.

- On Local Mode

When detecting the extraction site closed, the operation restarts and the counter is reset to zero.

- On Remote Mode

After an irregular stop, if the extracting drawer is opened and closed, the machine will restart.

Details are found on Timing Chart 2 (page 10).

4. 2 Overload stop

When the screw feeder indicates an Overload stop signal, the Overload LED lights up.

On Remote Mode, after the overload signal is detected, the terminal OUT7 changes from HI to Low.

Details are found on Timing Chart 3 (page 11).

To restart, switch ON the power.

Shut the power OFF to resolve any problems such as reducing the amount of screws in the hopper.

Then turn the power ON again to restart.

5. Miscellaneous

5. 1 Accessories

- AC adapter 1
- Manual book 1
- Screw feeder interface cable (approx 1m) 1

Note: Interface cable specifications

Connector: (Tajimi Electronics) PRC05-P8M 2

Cable connection : 8 wick straight

5. 2 Connector specifications

Connector code	Maker	Model number
[DC24V]	Marushin Electric Mfg. Co., Ltd.	MJ-20
[FM36]	Tajimi Electronics Co., Ltd.	PRC05-P8F
[INPUT]	Omron	XW4E-10B1-V1
[OUTPUT]	Omron	XW4E-10B1-V1

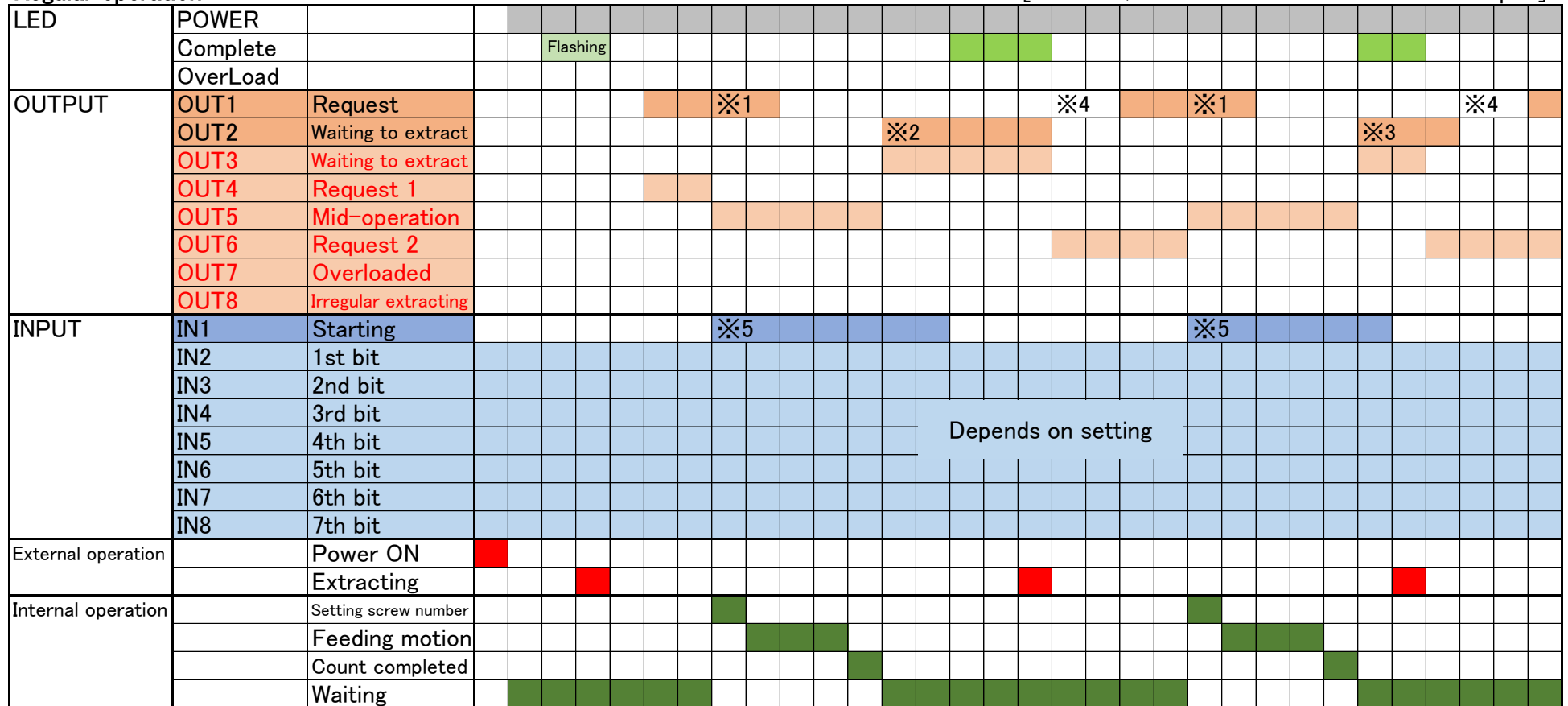
Appendix 1. Screw number settings and Input signals.

Setting number	IN8	IN7	IN6	IN5	IN4	IN3	IN2
0	HI	HI	HI	HI	HI	HI	HI
1	HI	HI	HI	HI	HI	HI	Low
2	HI	HI	HI	HI	HI	Low	HI
3	HI	HI	HI	HI	HI	Low	Low
4	HI	HI	HI	HI	Low	HI	HI
5	HI	HI	HI	HI	Low	HI	Low
6	HI	HI	HI	HI	Low	Low	HI
7	HI	HI	HI	HI	Low	Low	Low
8	HI	HI	HI	Low	HI	HI	HI
9	HI	HI	HI	Low	HI	HI	Low
10	HI	HI	HI	Low	HI	Low	HI
11	HI	HI	HI	Low	HI	Low	Low
12	HI	HI	HI	Low	Low	HI	HI
13	HI	HI	HI	Low	Low	HI	Low
14	HI	HI	HI	Low	Low	Low	HI
15	HI	HI	HI	Low	Low	Low	Low
16	HI	HI	Low	HI	HI	HI	HI
17	HI	HI	Low	HI	HI	HI	Low
18	HI	HI	Low	HI	HI	Low	HI
19	HI	HI	Low	HI	HI	Low	Low
20	HI	HI	Low	HI	Low	HI	HI
21	HI	HI	Low	HI	Low	HI	Low
22	HI	HI	Low	HI	Low	Low	HI
23	HI	HI	Low	HI	Low	Low	Low
24	HI	HI	Low	Low	HI	HI	HI
25	HI	HI	Low	Low	HI	HI	Low
26	HI	HI	Low	Low	HI	Low	HI
27	HI	HI	Low	Low	HI	Low	Low
28	HI	HI	Low	Low	Low	HI	HI
29	HI	HI	Low	Low	Low	HI	Low
30	HI	HI	Low	Low	Low	Low	HI
31	HI	HI	Low	Low	Low	Low	Low
32	HI	Low	HI	HI	HI	HI	HI
33	HI	Low	HI	HI	HI	HI	Low
34	HI	Low	HI	HI	HI	Low	HI
35	HI	Low	HI	HI	HI	Low	Low
36	HI	Low	HI	HI	Low	HI	HI
37	HI	Low	HI	HI	Low	HI	Low
38	HI	Low	HI	HI	Low	Low	HI
39	HI	Low	HI	HI	Low	Low	Low
40	HI	Low	HI	Low	HI	HI	HI
41	HI	Low	HI	Low	HI	HI	Low
42	HI	Low	HI	Low	HI	Low	HI
43	HI	Low	HI	Low	HI	Low	Low
44	HI	Low	HI	Low	Low	HI	HI
45	HI	Low	HI	Low	Low	HI	Low
46	HI	Low	HI	Low	Low	Low	HI
47	HI	Low	HI	Low	Low	Low	Low
48	HI	Low	Low	HI	HI	HI	HI
49	HI	Low	Low	HI	HI	HI	Low
50	HI	Low	Low	HI	HI	Low	HI
51	HI	Low	Low	HI	HI	Low	Low
52	HI	Low	Low	HI	Low	HI	HI
53	HI	Low	Low	HI	Low	HI	Low
54	HI	Low	Low	HI	Low	Low	HI
55	HI	Low	Low	HI	Low	Low	Low
56	HI	Low	Low	Low	HI	HI	HI
57	HI	Low	Low	Low	HI	HI	Low
58	HI	Low	Low	Low	HI	Low	HI
59	HI	Low	Low	Low	HI	Low	Low
60	HI	Low	Low	Low	Low	HI	HI
61	HI	Low	Low	Low	Low	HI	Low
62	HI	Low	Low	Low	Low	Low	HI
63	HI	Low	Low	Low	Low	Low	Low

Timing Chart 1

Regular operation

[OUTPUT/INPUT colored areas are Low output.]



※1: 2 seconds after detecting an input signal on IN1, OUT1 changes.

※2,3: OUT2 doesn't change at least for 2 seconds.

※4: 2 seconds after OUT2 changed, OUT1 changes.

※5: When OUT1 is Low output, screw number (IN2~8) is set by switching H/L on IN1.

Timing Chart 3

Overload stop

When the screw feeder is overloaded, the machine stops.

Turn OFF the screw feeder to solve the overload problem, then turn the power ON again.

Reset the PLC to the original, desired operation.

[OUTPUT/INPUT colored areas are Low output.]

LED	POWER		[OUTPUT/INPUT colored areas are Low output.]																															
	Complete		Flashing								Flashing								Flashing															
OUTPUT	OUT1	Request																																
	OUT2	Waiting to extract																																
	OUT3	Waiting to extract																																
	OUT4	Request 1																																
	OUT5	Mid-operation																																
	OUT6	Request 2																																
	OUT7	Overloaded																																
	OUT8	Irregular extracting																																
	INPUT	IN1	Starting	※4																※5														
IN2		1st bit																																
IN3		2nd bit																																
IN4		3rd bit	Depends on setting																															
IN5		4th bit																																
IN6		5th bit																																
IN7		6th bit																																
IN8		7th bit																																
External operation			Power ON																															
		Power OFF																																
		Extracting																																
Internal operation		Setting screw number																																
		Feeding motion																																
		Count completed																																
		Waiting																																

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