Wireless products for “POKAYOKE”

Transmitter [TWF-600T]

Receiver [TWF-700R]

HERUTU ELECTRONICS CORPORATION
62-1 TOYOOKA-CHO, KITA-KU, HAMAMATSU-SHI, SHIZUOKA-KEN, JAPAN
TEL 81-53-438-3555 FAX 81-53-438-3411 http://www.herutu.co.jp

2009.07.17

Outline



“TWF” Series is wireless equipment for “POKAYOKE”
Transmitter is “TWF-600T”,receiver is “TWF-700R”.
Transmitter is set with Torque wrench, Plier wrench, Check pen and so on.
When the limit switch of TWF-600T is hit, TWF-600T transmits.
The signal from Transmitter is tightening signal not torque value.

Receiver can receive the signal from the transmitter of set ID.
Transmitter has unique ID of about 65,000 kinds .It is set before shipment.
Receiver can registrate 4 kinds of unique ID. So Receiver can receive from 4 transmitter not at same time.

Outline

TWF-700R is receiver for Pokayoke that you can construct a simple poka-yoke system within the production line without installing large-scale equipment.

Receiver has 4modes.
Mode1-3 is counter function,Mode4 is through function. (no counting)

- Counter function manages number of counts and judge OK/NG.
- Through function output relay every receiving, when the receiver receives signal from transmitter.

Receiver has the lump for OK and NG judgement and buzzer for NG. In addtion, Receiver has the relay output for signal tower and revolving light and buzzer.

Equipment Configration

tool1

tool2

tool3

tool4

Wireless communication distance is about 50m.
Wireless communication way is one way.

Specification TWF-600T

- ◆Standard FCC Part15.231
- ◆Frequency 426.1MHz
- ◆ID 65526(Assingned before shipment)
- ◆Indicator Low battery alert LED
- ◆Power source Coin-type(CR2032)
- ◆Battery life Approx.150000 times or over
- ◆Dimensions 32W*71D*17.5Hmm
- ◆Weight Approx.40g

Specification TWF-700R

◆Display　Seven segment LED 2 digit
　　LCD（16digit*2lines）
　　Judgment lamp　(green、red)
◆In-put　Work-select(16kinds)
　　Tool-select（4kinds）
　　START/END/RESET
　　COUNT(for wired input)
◆Serial-port*2（one is unused）
◆Out-put　OUT1-4
(OK,NG,BZ according to the mode.）
◆Key seat
◆Buzzer
◆Power supply　DC24V(DC22-48V)
◆Frequency　426.1MHz(fixation)
◆Dimensions　190W*210H*50Dmm
◆Weight　Approx 1.6kg

Operation mode and Content of set registration

■**Operation mode**

Count mode	**①Count judge**
	②End input judge
	③Bar-code mode
Through mode	**④Through mode**

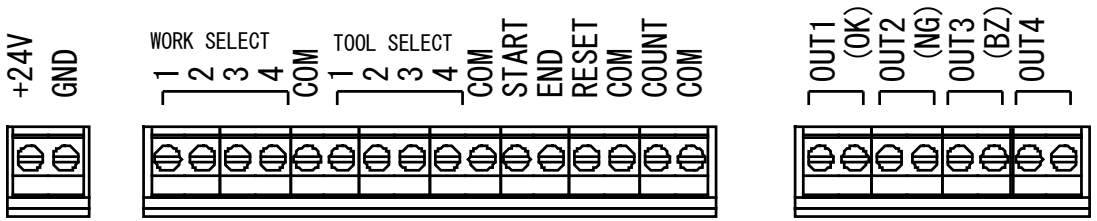
■**Set･registration**

Work value(16kinds)→Work select BCD16kinds
IDregistration(4kinds)→Tool select 4kinds
Double count prevention timer
Relay out put time (Only Mode4)
Buzzer sound (at count /at NG)
BZ output (at count/at NG）
Over counts

※Work Value and Count Value

The number of tightening movements required for a OK judgment is referred to as the “work value” and the number of tightening movements that have been performed using the specified method is referred to as the “count value.”

Terminal blocks



	Terminal blocks ,signal name	Content
Input Non-voltage - contact input	Work select1-16	Choose a work that is registered. 1-4 is connected in the binary, you can choose 16 kinds It is effective by mode only 1,2.
	Tool select 1-4	Choose a tool (transmitter-ID) that is registered. 1-4 is connected in the binary, you can choose. It is effective by mode only 1,2.
	START	It is a input start signal when begin to work.
	END	It is a input end signal when finish to work.
	RESET	It is a signal that resets the count value.
	COUNT	It is a count signal of cable input.
Output (Relay-output)	OUT1(OK)	It is an output of the OK signal in mode 1～3. It is an output in mode 4 corresponding to tool 1.
	OUT2(NG)	It is an output of the NG signal in mode 1～3. It is an output in mode 4 corresponding to tool 2.
	OUT3(BZ)	It is an output of the BZ signal in mode 1～3. It is an output in mode 4 corresponding to tool 3.
	OUT4	Mode 1～3 is unused. It is an output in mode 4 corresponding to tool 4.

Key command

Key command Allotment

Key	Content	Explanation
F1	Mode select	Select mode 1～4.
F2	Register ID	Register ID of tool select 1～4.
1	Register work - count	Register work value 16 kinds of work select.
2	Set time	W count prevention timer／Set the output-time
3	BZ output	At count／Set the presence of the BZ output terminal at NG.
4	Buzzer sound	At count ／Set the presence of the rumbling of the buzzer sound at NG.
5	Over count	At over count／Set invalidity

Mode explanation(Mode1)

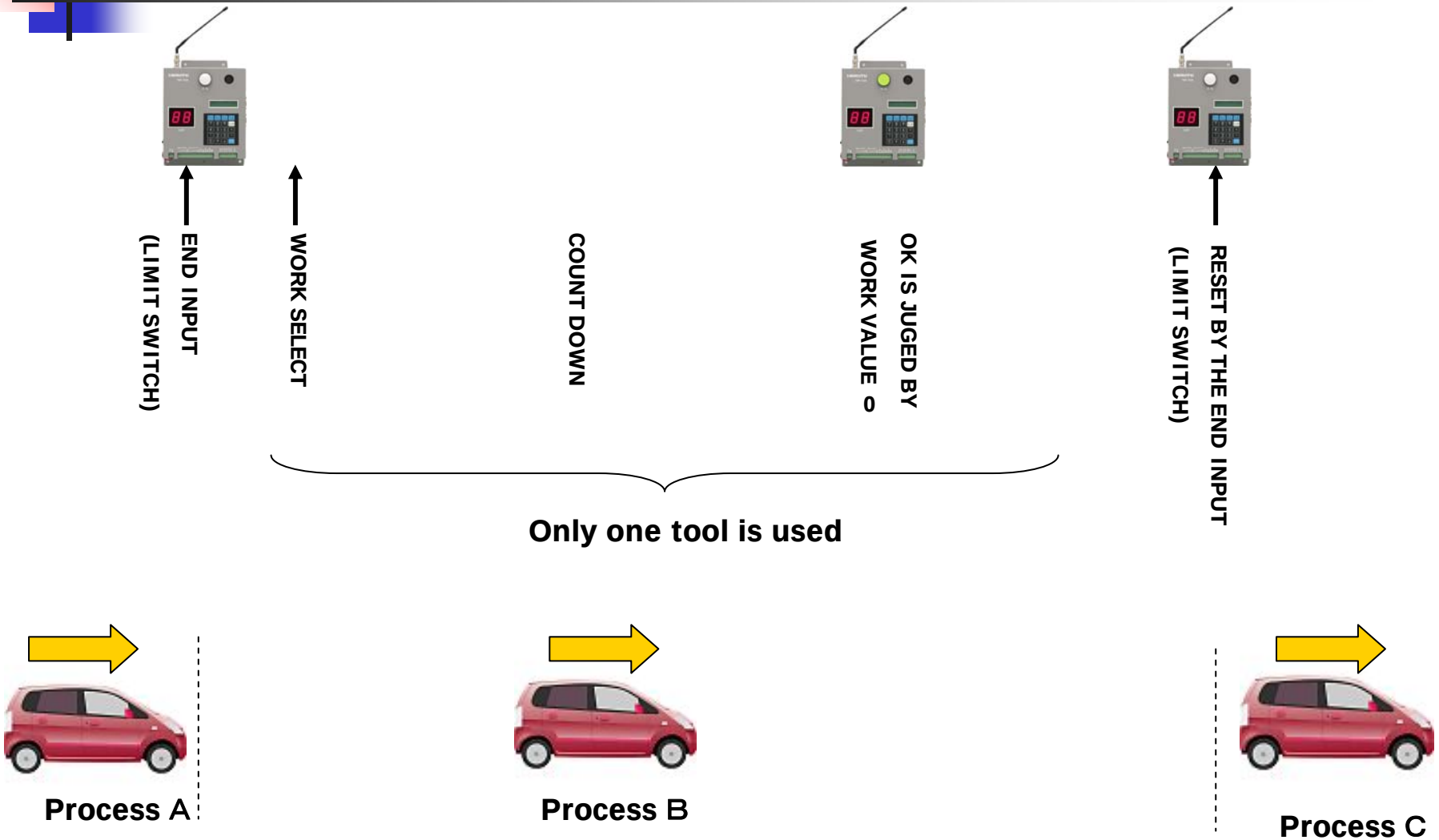
In this mode, the receiver uses the count value to make OK/NG judgments.
A switch (end input) is set at the final position of an operation. The switch input is received at the end of the operation.

If the count value reaches the work value before the end input, the receiver produces a OK judgment.

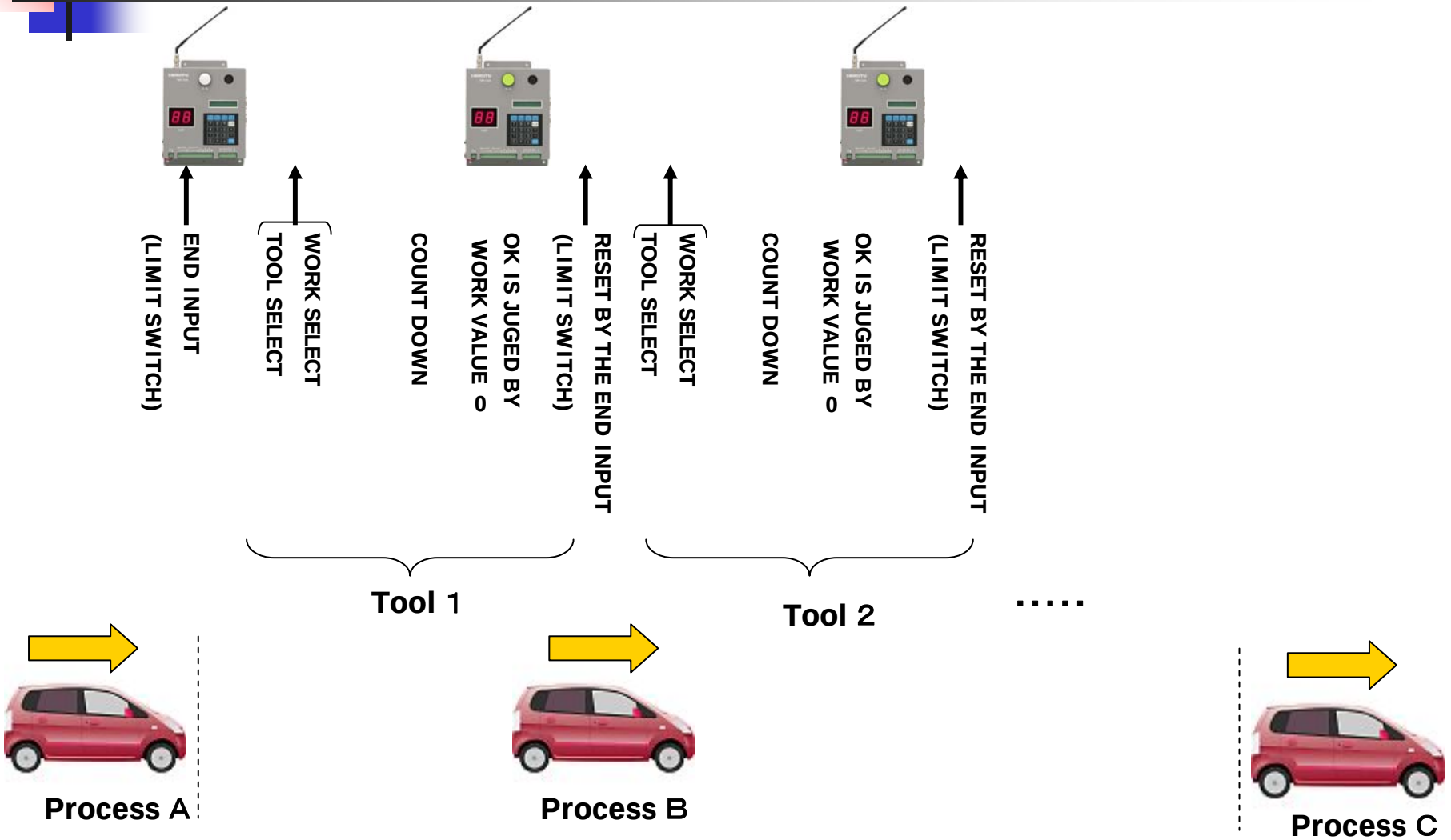
If the count value does not reach the work value by the time of the end input, the receiver produces a NG judgment. The NG judgment will change to a OK judgment if you apply the remaining necessary count signals.

At the time of the end input, if a OK judgment has already been produced, the count value is reset. You can clear a NG judgment by applying a reset signal to the receiver. This also resets the count value.
The count value is reset whenever the work value is changed.

Mode1 Count judge （only tool 1 is used）



Mode 1 count judge （few tools are used）

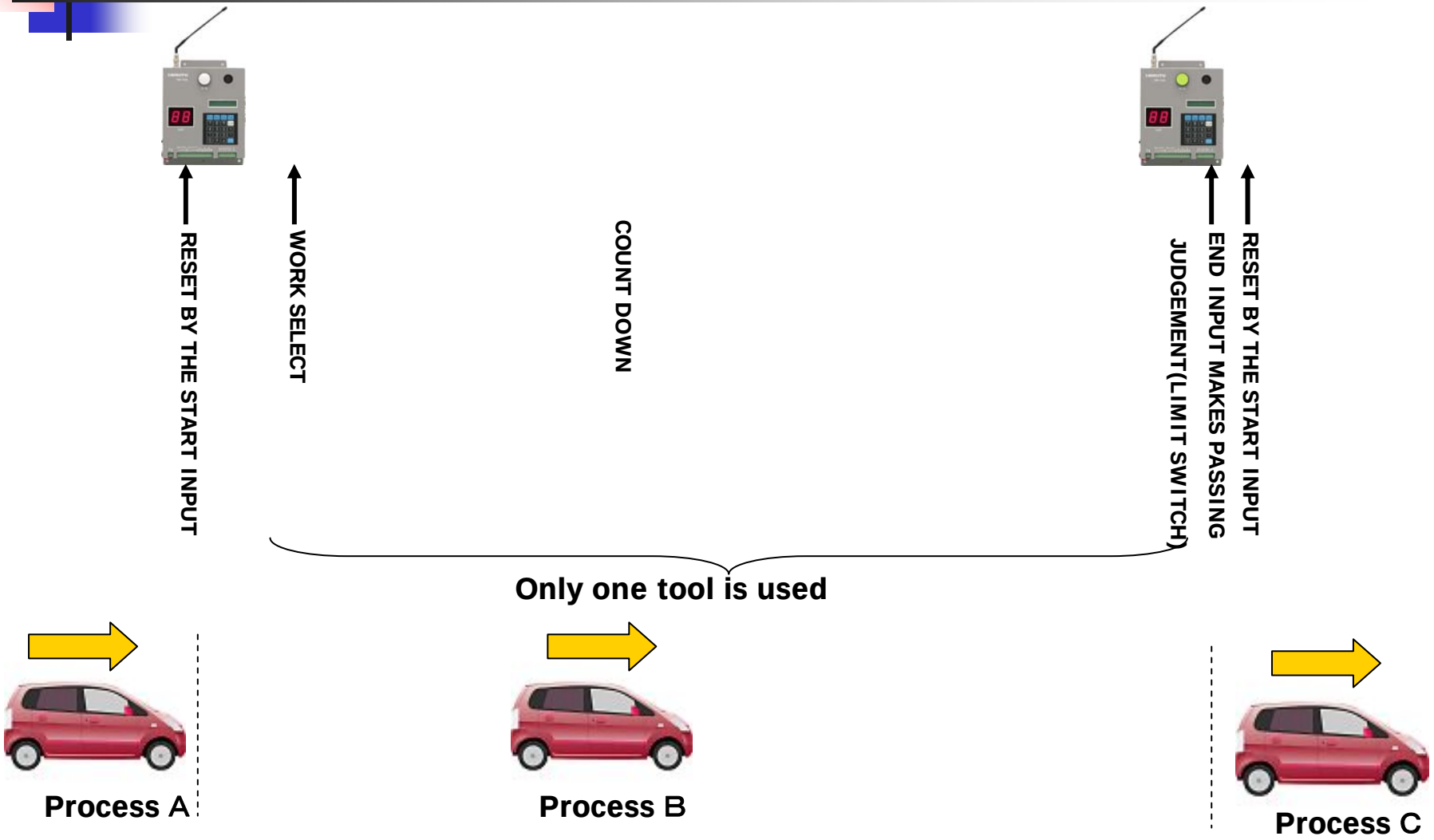


Mode explanation(Mode2)

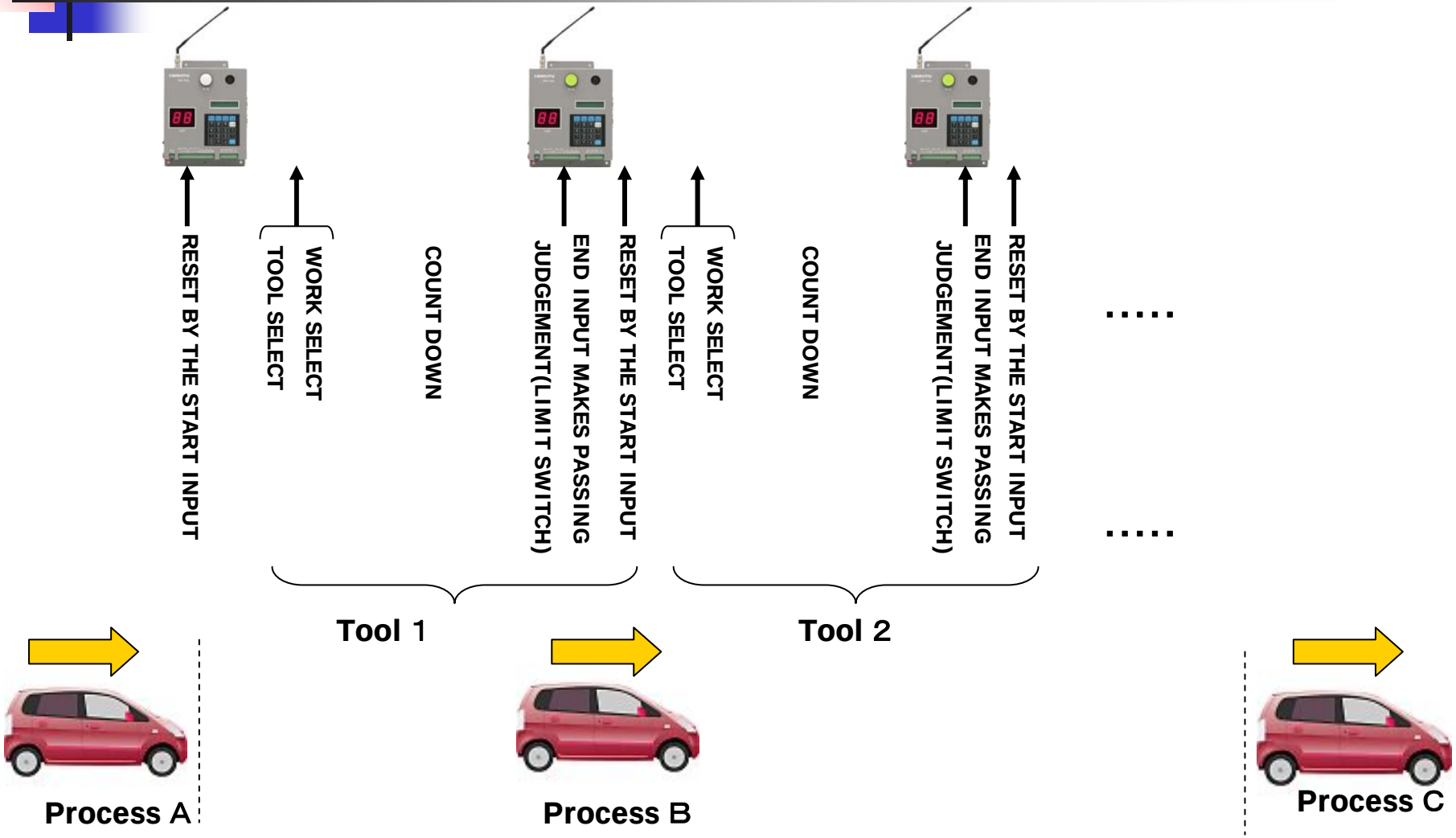
In this mode, the receiver uses the count value at the time that it receives the end signal to make OK/NG judgments.

A start input switch is set at the start position of an operation, and an end input switch is set at the final position.
The start switch input is received at the start of the operation, and then the tightening movement begins. After it receives the end input, the receiver performs OK/NG judgment by comparing the work value to the count value. If the work value and the count value are the same, the receiver produces a OK judgment. Otherwise, it produces a NG judgment.
If the receiver produces a NG judgment because the count value is below the work value, it will produce a OK value without receiving another end signal as you apply the remaining necessary count signals. If the receiver produces a NG judgment because the count value is greater than the work value, you can clear the NG judgment by applying are set signal to the receiver. This also resets the count value.
If the receiver produces a NG judgment, it resets the count value after it receives the next start signal.

Mode2 END input judge （ only tool 1 is used ）



Mode2 End input judge （few tools are used）



Mode explanation(Mode3)

In this mode, instead of selecting tools and work values by applying signals to terminal blocks, you select them by reading data from a barcode. The tool selection terminals and work selection terminals are invalid when this mode is being used.
The work values (1 to 98) for five tools can be read from a barcode.Tools 1 through 4 are for wireless transmissions, and tool 5 is for the wired input to the count input terminal block.

OK/NG judgment is not performed on each tool. Instead, the receiver produces a OK judgment when all of the count values are equal to the work values specified in the barcode. The receiver does not manage the order in which the tools are used, so as long as the count values of all the tools reach their specified work values, the receiver produces a OK judgment.
The receiver loads the barcode at the start of the operation. The receiver receives an end signal when the operation finishes. If the count value of each tool reaches its corresponding work value before the end input, the receiver produces a OK judgment. If the count value of one of the tools does not reach its corresponding work value by the time of the end input, the receiver produces a NG judgment. If the receiver has already produced a OK judgment by the time it receives the end signal, the work value is reset.
The method of OK/NG judgment is the same as that for mode 1.

HERUTU

Mode3 Bar-code mode

sample

tool 1→1

tool 2→2

tool 3→3

tool 4→4

tool 4→0(cable)

0102030400

RESET BY THE END INPUT (LIMIT SWITCH)

READ BARCODE(READ WORK VALUE OF TOOL 1 - 4

■ Content of bar-code

TOOL1→＊COUNT

TOOL2→＊COUNT

TOOL3→＊COUNT

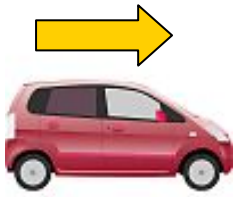
TOOL4→＊COUNT

TOOL 1 - 4 COUNT DOWN

OK IS JUGED BY WORK VALUE OF TOOL 1 - 4

RESET BY THE END INPUT

Not unit of tool,Passing judgment is done by unit of instruction content from bar-code



Process A

Process B

Process C

Mode3 Bar-code mode

RS-232C Array

term	signal	content	direction
2	RXD	Data input	machine ← BCR
3	TXD	Out input	machine → BCR
5	SG	Signal wire playground	machine — BCR
7	RTS	Transmission request	machine → BCR
8	CTS	Transmission permission	machine ← BCR

Sample

TOOL1→1

TOOL2→2

TOOL3→3

TOOL4→4

TOOL5→0(cable)

Communication protocol

Item	content
Transmission rate	9600bps
Stop-bit	1bit
Data length	8bit
Parity-check	nothing

Communication format

Tool 1 counts	Tool 2 counts	Tool 3 counts	Tool 4 counts	Cable tool counts
2byte	2byte	2byte	2byte	2byte

Bar-code standard CODE39

Mode explanation(Mode4)

In this mode, the receiver simply relays the signal that it receives from the transmitter. You can determine the length of time for which the receiver will transmit relayed signals by specifying the output time setting. You can specify up to four transmitter IDs, so you can use the receiver to relay the signals of four transmitters. (However, multiple signals cannot be received at the same time.)

Mode4 Through mode

tool1

tool2

tool3

tool4

The relay of each tool is output from the output terminal stand.

Tool1→OUT1

Too2→OUT2

Tool3→OUT3

Tool4→OUT4

Process A

Process B

Process C

HERUTU

Price (Catalog price)

POKAYOKE Receiver TWF-700R ¥140,000JPN

Transmitter TWF-600T ¥25,200JPN (New price revisions)

Reference＜Equipment connected with this machine＞

Product name	Reference price
Accumulating LME-202FB-RG(PATLITE)	¥15,000
Bar-code scanner HC56TR(DENSO)	¥60,000
AC adapter(AC100-240V/DC24V) for TWF-700R	¥2,100
Work-select BOX(16kinds)	**********
Tool-select BOX(4kinds)	**********