

# Tunneling Alignment System

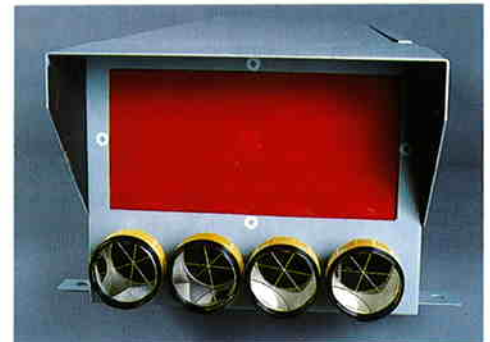
## Type MMIC 8002N



## シールド掘進機位置姿勢検出システム

### MMIC Control Box

Serves as the interface between the master computer and the target box and total station. MMIC 8001 ( $\times 2$ ) reads the screen X, Y coordinates and distance to the laser point of origin. MMIC 8002 internal CPU calculates the tunneling machines degree of pitching and yawing. The results are sent to the master computer.



### Total Station Controller

The Controller interfaces between the Total Station and the MMIC/Computer. The distance reading from the EDM is sent through the controller to the computer. The controller is also used to operate the pulse motor (in order to realign the laser) either manually, or as instructed by the main computer.



### Target Box

Consists of a detector (for the distance meter) and two CCD light sensitive (200m(h) $\times$ 150mm(v)) screens set 1 metre apart. The X, Y coordinates of the laser beam on the respective screens are sent to the MMIC control box, Accuracy  $\pm 1$ mm. The target box is attached directly to the tunneling machine.

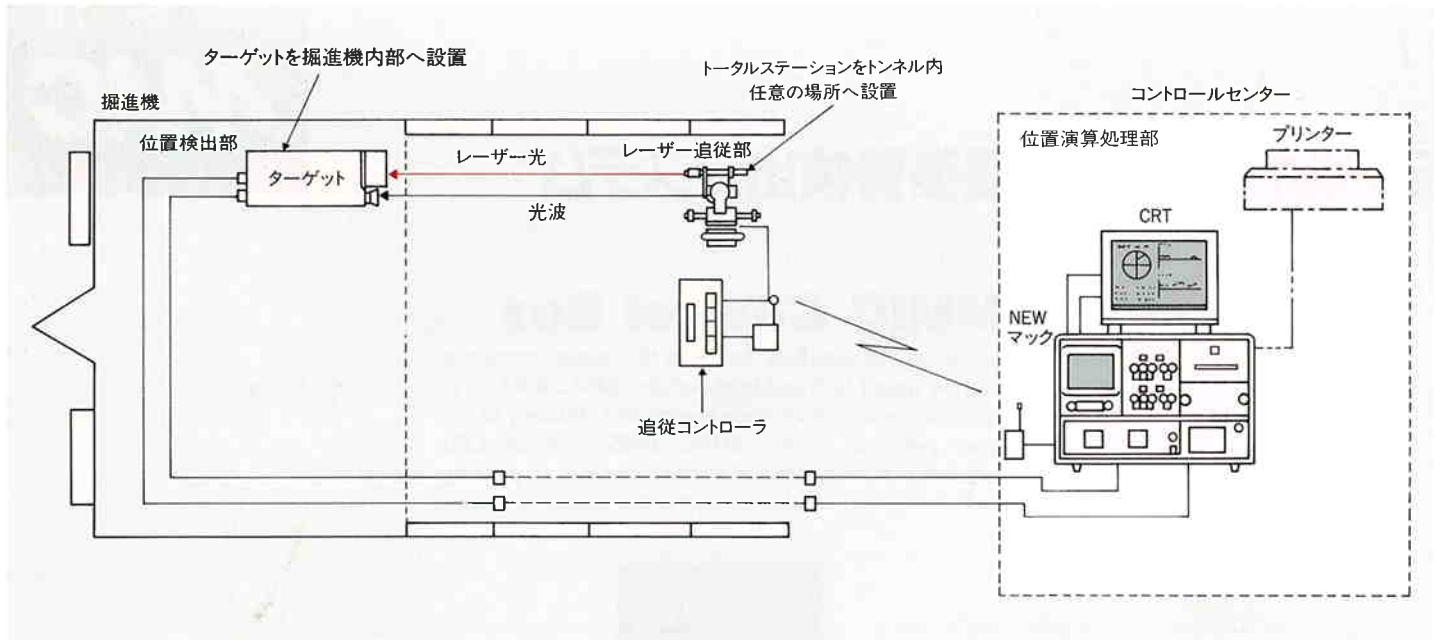
### Total Station

Employs a laser and distance meter. Distance to the target box is sent directly to the MMIC control box. A pulse motor enables the Master Computer to realign the laser beam in line with the target box as required.

高信頼性の位置姿勢計測データを提供、掘進機の自動化を実現します。

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## Three-Dimensional Measurement High-accuracy within $\pm 1\text{mm}$



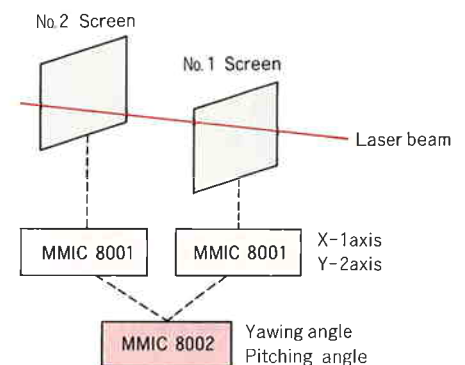
### Outline of MMIC

Target box is installed in a working object, for example 'Tunneling Machine'. Laser spot beam is projected on two screens of target box from a datum point. (Reference point.) Signal from CCD (Charge Coupled Device) built in Target Box, is fed into controller as micro-computer signal. Movement of the object can be indicated by horizontal and vertical directions with 'milli-meter' and  $\tan \theta$  on LED display. CRT display indicates displacement and deviation of a object from a planned route. This system has an output function to correct movement of a object.

「シールド掘進機位置姿勢検出システム」は、高精度レーザー受光位置姿勢検出装置と自動追従機構を装備、掘進機自動化のために高い信頼性のデータを提供します。ターゲットを移動する被測定体に取り付け、基準点からレーザー光をターゲットに照射し、その信号をコントローラに取り込み、被測定体の移動量と偏位をX,Y,Z方向の形で検出・表示します。レーザーは、X方向・Y方向に首振りでき、ターゲット寸法以上の被測定体の移動にも対応できます。

精度仕様 ※MMIC単体精度…………… $\pm 1\text{mm}$

MMIC 8002 System



◎使用実績

1. 名古屋交通局
2. 福岡高速鉄道
3. 豊砂幹線
4. 富山共同溝
5. 都営12号……………他 110件