

WISENET

# サーマル ネットワークカメラ ユーザーマニュアル

TNO-4030T/TNO-4040T/TNO-4041T  
TNO-4050T/TNO-4051T  
TNO-4030TR/TNO-4040TR/TNO-4041TR

CE

# サーマルネットワークカメラ ユーザーマニュアル

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❖ デフォルトの管理者IDは“admin”です。パスワードは初めてログインするときに設定する必要があります。

個人情報を安全に保護し、情報窃盗による被害を防ぐため、パスワードは3か月ごとに変更してください。

パスワードの不正管理によって発生したセキュリティおよびその他の問題は、ユーザー側の責任であることに御注意ください。

## 重要な安全ガイド

1. 本書の説明をよく読んで下さい。
2. 本書の指示を守ってください。
3. 全ての警告を留意してください。
4. 全ての指示に従って下さい。
5. 本機を水の傍で使用しないで下さい。
6. 柔らかく乾いた布か湿った布で製品表面の汚れた部分を拭き取ります。(アルコール成分、溶剤、界面活性剤や油分を含む洗剤や化粧品を使用しないでください。製品の変形や損傷につながる恐れがあります。)
7. どの換気孔も塞がないようにして下さい。メーカーの指示に従って取り付けして下さい。
8. ラジエーター、熱レジスタ、あるいは熱を発生するその他の装置（アンプを含む）などの熱源の傍に設置しないで下さい。
9. 分極タイプあるいは接地タイプのプラグの安全目的を必ず守ってください。分極プラグには一方が他方より幅広い2本の足が付きます。接地プラグには2本の足とアース（接地）差込み先が付いています。2本の平たい足あるいは3本めの差込み先はユーザーの安全のために付いています。提供されたプラグがお使いのコンセントに合わない場合には、旧式のコンセントの交換について電気技師にご相談下さい。
10. 特にプラグ、ソケット、機器との接点でコードが踏まれたり引っ張られたりしないよう電源コードを保護してください。
11. メーカーが指定する付属品のみを使用してください。
12. カート、スタンド、三脚、ブラケットはメーカー指定のもの、あるいは製品と一緒に販売されたもののみを使用してください。カートを使用する場合、カートと製品を動かす際には転倒による損傷に注意してください。
13. 雷雨のときまたは長期間使用しない場合は、製品の電源プラグを抜いてください。
14. 全ての修理は資格のあるサービス・スタッフに任せて下さい。修理は電源コードあるいはプラグの損傷、液体をこぼした、または物体を機器内に落としてしまった、機器を雨や湿度にさらしてしまった、正常に機能しない、あるいは機能の低下など、様々な原因で機器が損傷した場合に必要となります。
15. この製品は、“クラス2”または“LPS”と表示があり、定格24 Vdc(50/60Hz)、最小0.91 Aまたは定格12 Vdc、最小0.83 Aの記載電源ユニットにより電気供給が行われるものとします。
16. 製品取付け時に力を入れ過ぎると、カメラが損傷し、誤作動を起こす場合があります。適切でないツールを使用して製品を力まかせに取り付けると、カメラが損傷する場合があります。
17. 化学物質やオイルミストが存在する、または生成される可能性のある場所には製品を取り付けしないでください。大豆油のような食用油によって製品が損傷を受けたりゆがんだりするため、キッチンやキッチンテーブル付近には製品を取り付けしないでください。製品に損傷を与える原因となります。
18. 製品を取り付ける場合、製品表面が化学物質で汚染されないように注意してください。クリーナーや接着剤のような化学溶剤は、製品表面に深刻な損傷を与える原因となります。
19. 推奨されない方法で製品を取り付け/取り外した場合、製品の機能/性能は保証できません。ユーザーマニュアルの“取付けと接続”を参照して製品を取付けます。
20. 水中での製品の取付けや使用は、製品への深刻な損傷の原因となります。



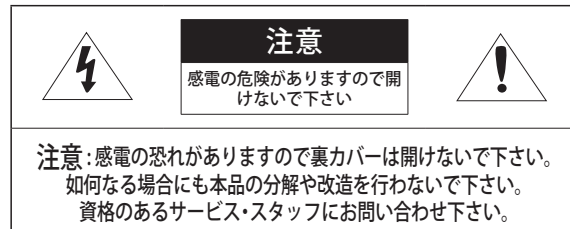
## 警告

火災または感電防止のため、この装置を雨または湿気にさらさないでください。本製品の換気グリルまたはその他の開口部から金属製物質を差し込まないでください。

製品に液体をこぼしたりかけたりせず、また花瓶のように液体が入った物体を製品の上に載せたりしないでください。

損傷を防止するため、本製品を設置説明に従って壁/天井にしっかりと取り付けてください。

## 注意



## グラフィック記号の説明



正三角形内の稲妻型の矢印は、本製品の筐体に人が感電する恐れのある“高圧電流”が存在することを、ユーザーに警告するものです。



正三角形内の感嘆符は、製品の操作およびメンテナンス(修理)に関する重要な付属説明書があることをユーザーに知らせるものです。

# 概要

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## クラス I 構造

クラス I 構造を持つ装置は保護接地接続のある本線ソケットに接続してください。

## バッテリー

電源 (バッテリーパックまたは取り付けられた状態のバッテリー) は直射日光の当たる場所や、熱器具の近くには置かないでください。

## デバイスの切断

問題がある場合は、装置からメインプラグを抜きます。次にお住まいの地域の修理会社に電話してください。

**米国外では、認証機関が採用している取付け金具用の HAR コードが使用される場合があります。**

## 注意

電池を間違ったタイプと交換すると爆発の危険性があります。指示に従って使用済み電池を処分してください。

これらの保守説明書は、資格のあるサービススタッフのみが使用するものです。感電の危険性を低減するために、資格がある場合を除き操作説明書に含まれていない修理は行わないでください。

本製品の CVBS アウト端子は、簡単なインストールのために提供されており、監視目的にはお勧めできません。

入力電源は1台のカメラにのみ使用し、他のデバイスを接続しないでください。

**ITE は、外部の施設ヘルレーティングなしで、PoE ネットワークのみに接続することになっています。**

次に示す安全のための推奨注意事項を熟読してください。

- 本製品は平らな場所に置いてください。
- 直射日光の当たる場所、暖房設備または低温区域の近くには取付けしないでください。
- 本製品を導電性の高い物体の近くに置かないでください。
- 本製品は自分で修理しないでください。
- 本製品の上に水の入ったコップを置かないでください。
- 磁気源のそばに取付けしないでください。
- 換気口は塞がないようにしてください。
- 本製品の上に重いものを置かないでください。
- カメラを取り付ける/取り外すときは、保護手袋を着用してください。製品表面は高温になるため、やけどの原因となる場合があります。

ユーザーマニュアルは、本製品の使用方法に関するガイドブックです。

このマニュアルで使用する用語の意味を次に示します。

- 参照: 製品の使用方法についてのヘルプ情報を示す場合。
  - 注意: 指示に従わないことで、ものや人に損害が発生する可能性がある場合。
- ※ 製品を使用する前に安全のためこのマニュアルを読み、大切に保管しておいてください。

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# 概要

## お奨めする PC 仕様

- CPU : Intel(R) Core(TM) i7 3.4 GHz以降
- RAM : 8G以上
- 対応OS : MS Windows, Mac OS X
- 推奨するブラウザ: Google Chrome  
サポートするブラウザ: MS Explorer, MS Edge, Mozilla Firefox (Window 64bitのみ)、Apple Safari (Mac OSXのみ)  
確認済みのOSとブラウザに関する詳細情報は、付録を参照してください。

## 推奨マイクロSD/SDHC/SDXCメモリーカード仕様

- 推奨容量 : 推奨容量:16GB~256GB (MLCタイプ)
- 以下の製造業者および種類のメモリーカードをこのカメラで使用することを推奨します。
  - 製造業者: SanDisk, Transcend
  - 製品グループ: 高耐久

## NAS推奨仕様

- 推奨容量 : 200GB又はそれ以上を推奨します。
- 同時アクセス : NAS1台で最大16台のカメラ接続を受けられます。
- このカメラのために、NASを以下の製造仕様で利用することを推奨します。

推奨製品	入手可能なサイズ
QNAP NAS	最大16台のカメラが同時にアクセスできます。
Synology NAS	最大16台のカメラが同時にアクセスできます。



- NAS装置をビデオ映像の保存以外の目的で使用する場合、利用できるカメラの数は減る場合があります。

## キット内容 (TNO-4030T/4040T/4050T/4030TR/4040TR)

製品パッケージに、カメラと付属品がすべて同梱されていることをご確認ください。  
(販売国ごとに付属品が異なるため。)

外観	品目名	数量	説明
	カメラ	1	
	説明書、 インストールS/W CD	1	
	クイックガイド (オプション)	1	
	保証書 (オプション)	1	
	テストモニタ用ケーブル	1	ポータブルディスプレイデバイスとカメラとの接続をテストするために使用します
	テンプレート	1	製品設置ガイド
	電源端子台	1	電源プラグに差し込む
	オーディオ/アラーム端子ブロック	1	オーディオ/アラームプラグに差し込みます。
	電源ケーブル	1	電源ポートへプラグを差し込むために使用

外観	品目名	数量	説明
	L型レンチ	1	ドーム型カバーを取り外し、交換するために使用
	オーディオ/アラームケーブル	1	オーディオポート及びアラームポートへの接続に使用
	タッピングネジ	4	壁または天井に取付けるために使用します
	日除け	1	カメラを直射日光から保護します
	日除け留め	1	日除けをカメラに固定します
	BASE WALL MOUNT	1	カメラを壁に吊るすために調整する必要があるアダプタ
	ケーブルブッシュ	1	直径が7~8.5mmのLANケーブルとの接続に使用します。

# 概要

## キット内容 (TNO-4041T/4051T/4041TR)

製品パッケージに、カメラと付属品がすべて同梱されていることをご確認ください。  
(販売国ごとに付属品が異なるため。)

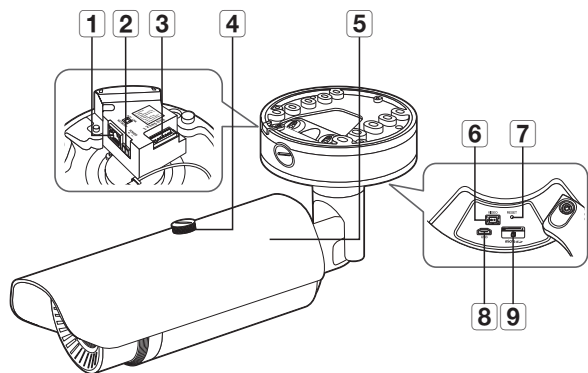
外観	品目名	数量	説明
	カメラ	1	
	説明書、 インストールS/W CD	1	
	クイックガイド (オプション)	1	
	保証書 (オプション)	1	
	テストモニターケーブル	1	ポータブルディスプレイデバイスとカメラとの接続をテストするために使用します
	テンプレート	1	製品設置ガイド
	電源端子台	1	電源プラグに差し込む
	オーディオ/アラーム端子ブロック	1	オーディオ/アラームプラグに差し込みます。
	電源ケーブル	1	電源ポートへプラグを差し込むために使用
	星型レンチ	1	PTブラケットを本体に固定するために使用します。

外観	品目名	数量	説明
	オーディオ/アラームケーブル	1	オーディオポート及びアラームポートへの接続に使用
	日除け	1	カメラを直射日光から保護します
	日除け留め	1	日除けをカメラに固定します
	防水性ストッパー	1	ケーブルが通っていない穴をブロックするために使用します。
	防水性アダプタ	1	ケーブル範囲:Ø2mm(最小)~Ø6mm(最大)ケーブル接続に使用します。(例:電源ケーブル) ※ カメラからの付属ケーブルグラッドは、Ø4.5mm(最小)~Ø10mm(最大)ケーブルに適用されます。



## 概観 (TNO-4030T/4040T/4050T/4030TR/4040TR)

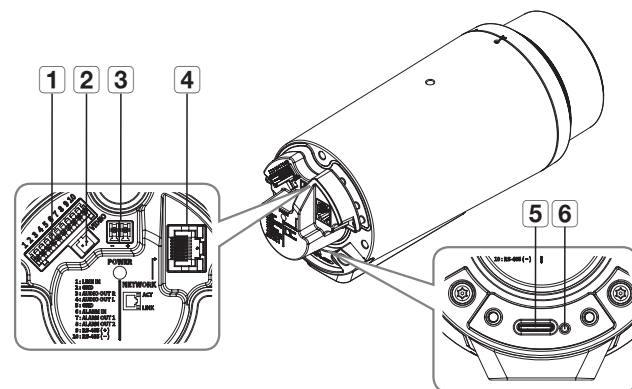
### 外観&部品



項目	説明
1 ネットワークポート	ネットワーク接続用のPoEまたはイーサネットケーブルの接続に使用します。
2 電源ポート	電源ケーブルの差込みに使用します。
3 オーディオポート及びアラームケーブルポート	オーディオとアラームケーブルを接続するポート。
4 日除け留め	日除けをカメラに固定します。
5 日除け	カメラを直射日光から保護します。
6 テストモニター出力	ビデオ出力のテスト監視用出力ポートです。テストモニターケーブルを使用して、モバイルディスプレイに接続し、テストビデオをチェックします。
7 リセット・ボタン	すべてのカメラ設定を工場出荷時のデフォルトに復元します。 約5秒間押し続けてシステムを再起動します。 ■ カメラをリセットすると、DHCPを有効化されるようにネットワーク設定が調整されます。ネットワーク内にDHCPサーバーがない場合は、Device Managerプログラムを用いて基本的なネットワーク設定(IPアドレス、Subnet Mask、Gatewayなど)を再設定してから接続することができます。
8 MICRO USBポート	Wi-Fi dongleに接続するポート スマートフォンにインストールしたアプリケーションを通じてインストールビデオを確認できます。 15ページの「Wi-Fi dongleへの接続」を参照します。 ■ Wi-Fi dongleとOTGアダプタは別売りです。
9 MicroSDカードスロット	MicroSDカードを挿入できるスロットです。

## 概観 (TNO-4041T/4051T/4041TR)

### 外観&部品



項目	説明
1 オーディオポート及びアラームケーブルポート	オーディオとアラームケーブルを接続するポート。
2 テストモニター出力	ビデオ出力のテスト監視用出力ポートです。テストモニターケーブルを使用して、モバイルディスプレイに接続し、テストビデオをチェックします。
3 電源ポート	電源ケーブルの差込みに使用します。
4 ネットワークポート	ネットワーク接続用のPoEまたはイーサネットケーブルの接続に使用します。
5 MicroSDカードスロット	MicroSDカードを挿入できるスロットです。
6 リセット・ボタン	すべてのカメラ設定を工場出荷時のデフォルトに復元します。 約5秒間押し続けてシステムを再起動します。 ■ カメラをリセットすると、DHCPを有効化されるようにネットワーク設定が調整されます。ネットワーク内にDHCPサーバーがない場合は、Device Managerプログラムを用いて基本的なネットワーク設定(IPアドレス、Subnet Mask、Gatewayなど)を再設定してから接続することができます。

# 取付けおよび接続

## 取付け (TNO-4030T/4040T/4050T/4030TR/4040TR)

- 本カメラは防水であり、IP66仕様に準拠していますが、外部ケーブルに接続されるジャックはそうではありません。ケーブルが外部に突出するのを防止するために軒先の下に本製品をインストールすることをお勧めします。

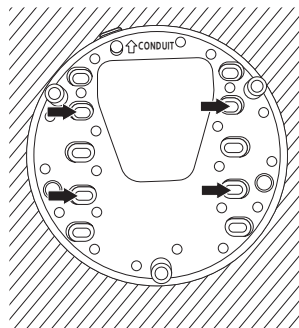
### 取付けに関する注意事項

カメラを取り付ける前に、以下の指示をよく読んでください。

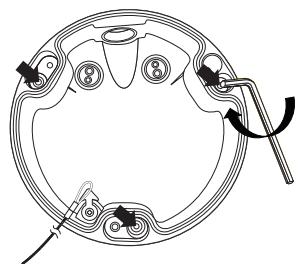
- 取付ブラケットを含むカメラの5倍の重量に耐えることができる場所（天井または壁）にインストールする必要があります。
- 引っかかっていたり、はがれたケーブルは製品の損傷または火災の原因となります。
- 安全のため、設置場所に人を近づけないでください。また、万が一のため持ち物は取付け場所には置かないでください。
- サンシールド用ホールは、サンシールドを接続する以外の目的で使用してはなりません。
- 製品取付け時に力を入れ過ぎると、カメラが損傷し、誤作動を起こす場合があります。適切でないツールを使用して製品を力まかせに取り付けると、カメラが損傷する場合があります。

### 取付け

1. 付属のタッピングねじを使用し、ベースウォールマウントを固定します。

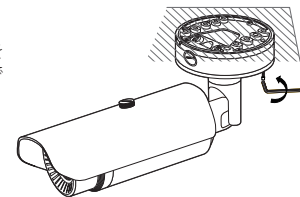


2. 底面カバー内にある矢印のような形をしたフックに安全ケーブルを吊るします。
3. 適切なケーブルをカメラ端末に接続します。
4. ベースウォールマウントに底面カバーを取り付けてから、付属のL型レンチを使用して3つのねじを接続して固定します。
5. 底面カバーにカメラを取り付けてから、付属のL型レンチを使用して3つのねじを上面カバーに接続して固定します。



6. 付属のL型レンチを使用してカメラ方向を調節します。

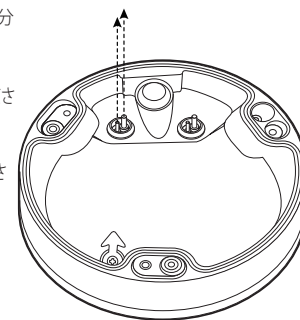
- ブラケットを使用してカメラ位置を調整するとき、ブラケットねじを緩め、カメラを調節し、締め付けます。ねじが固定されている状態で力任せに調節しようとすると、傷がつく恐れがあります。



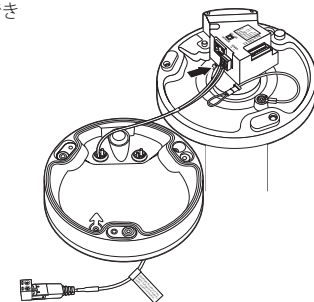
### 防水電源ケーブルとLANケーブルの接続

1. 下図のように、下部カバーの底部に突き出たゴム製カバーの部分を抜き取ります。

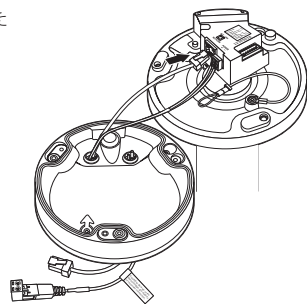
- LANケーブルと接続するのに適切なケーブルブッシュを使用してください。
  - 基本のカメラ:直径5.0~6.5mmのケーブルを使用してください。
  - 同梱のコンポーネント:直径7.0~8.5mmのケーブルを使用してください。



2. 上記ステップ1でゴム製プラグの突き出た部分を取り除いてできた小さな穴に、電源ケーブルを挿入します。
3. 電源ケーブルを電源端子台と接続してください。

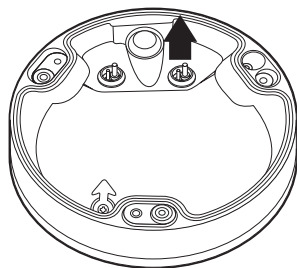


- LANケーブルを上記のステップ1にあるラバープラグの突き出た部分を取り外して作った大きい穴に挿入してください。
- 覆いをケーブルカッターで取り外し、ケーブルを調整してください。
- LANケーブルをLANコネクタで接続し、LANツールに挿入してください。
- 完成したケーブルをEthernetポートに接続してください。

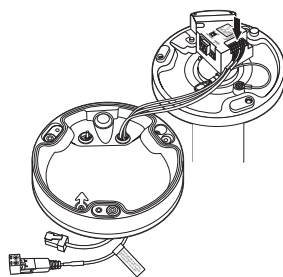


### アラームおよび音声ケーブルの接続

- 下図のように、下部カバーの底部にあるゴム製カバーを取り除きます。



- NO.1のゴムキャップを取り除いてできた穴を通してアラーム/音声ケーブルを挿入し、ケーブルをアラーム端子に接続します。
- カメラを取り付けるときに傷ついたり、押しつぶされたりしないようにケーブルを調整してください。
- アラーム/音声ケーブルにあるゴムキャップを穴に付けます。



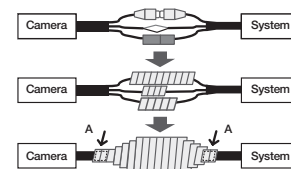
### 屋外設置

建物の外に本製品を取り付ける際、屋外に接続されたケーブルとの隙間から水が漏入しないように、防水ブチルゴムテープ(店舗で購入することができます)を使って防水してください。

- I/Oやオーディオのケーブルを接続します。
- 防水ブチルゴムテープの半分以上が重なるようにして黒のケーブルジャケット(エリアA)とケーブル接続箇所を巻きつけます。



- ケーブルジャケットが適切に防水加工されていない場合、それが直接漏れを引き起こす可能性があります。ケーブルをテープで何度も巻くことで保護するようにしてください。



- 防水ブチルテープはブチルゴムで作られており、通常の2倍の長さに伸ばすことができます。

### 取付け (TNO-4041T/4051T/4041TR)



- 本カメラは防水であり、IP66仕様に準拠していますが、外部ケーブルに接続されるジャックはそうではありません。ケーブルが外部に突出するのを防止するために軒先の下に本製品をインストールすることをお勧めします。

#### 取付けに関する注意事項

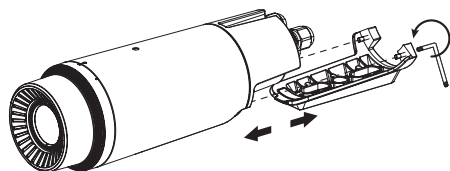
カメラを取り付ける前に、以下の指示をよく読んでください。

- 取付ブラケットを含むカメラの5倍の重量に耐えることができる場所（天井または壁）にインストールする必要があります。
- 引っかかっていたり、はがれたケーブルは製品の損傷または火災の原因となります。
- 安全のため、設置場所に人を近づけないでください。また、万が一のため持ち物は取付け場所には置かないでください。
- サンシールド用ホールは、サンシールドを接続する以外の目的で使用してはなりません。
- 製品取付け時に力を入れ過ぎると、カメラが損傷し、誤作動を起こす場合があります。適切でないツールを使用して製品を力まかせに取り付けると、カメラが損傷する場合があります。

# 取付けおよび接続

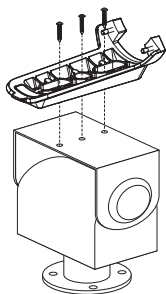
## 取付け

1. 星型レンチを使用し、PTブラケットを本体から取り外します。



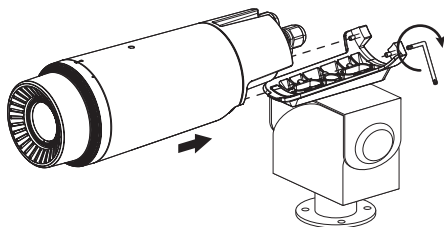
2. 図に示すように、3つの穴にねじを固定してPTドライバーとPTブラケットを締めます。

- PTドライバーは付属しません。



3. 星型レンチを使用し、PTブラケットと本体を締めます。

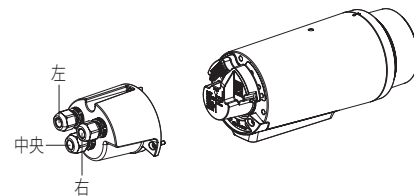
- ブラケットを使用してカメラ位置を調整するとき、ブラケットねじを緩め、カメラを調節し、締め付けます。ねじが固定されている状態で力任せに調節しようとすると、傷がつく恐れがあります。



## 防水電源ケーブルとLANケーブルの接続

1. 下図のように、下部カバーの底部に突き出たゴム製カバーの部分を抜き取ります。

- LANケーブルと接続するのに適切なケーブルブッシュを使用してください。
  - 基本のカメラ:直径5.0~6.5mmのケーブルを使用してください。
  - 同梱のコンポーネント:直径7.0~8.5mmのケーブルを使用してください。



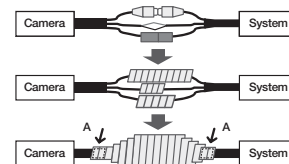
2. 電源ケーブルを、上記ステップ1でゴム製プラグの突き出た部分を取り除くことによってできた中央穴に差し込みます。
3. 電源ケーブルを電源端子台と接続してください。
4. LANケーブルを、上記ステップ1でゴム製プラグの突き出た部分を取り除くことによってできた右穴に差し込みます。
5. 覆いをケーブルカッターで取り外し、ケーブルを調整してください。
6. LANケーブルをLANコネクタで接続し、LANツールに挿入してください。
7. 完成したケーブルをEthernetポートに接続してください。
8. 端子ブロックケーブルを、上記ステップ1でゴム製プラグの突き出た部分を取り除くことによってできた左穴に差し込みます。

## 屋外設置

建物の外に本製品を取り付ける際、屋外に接続されたケーブルとの隙間から水が漏入しないように、防水プチルゴムテープ (店舗で購入することができます) を使って防水してください。

1. I/Oやオーディオのケーブルを接続します。
2. 防水プチルゴムテープの半分以上が重なるようにして黒のケーブルジャケット (エリアA) とケーブル接続箇所を巻きつけます。

- ケーブルジャケットが適切に防水加工されていない場合、それが直接漏れを引き起こす可能性があります。ケーブルをテープで何度も巻くことで保護するようにしてください。
- 防水プチルテープはプチルゴムで作られており、通常の2倍の長さに伸ばすことができます。

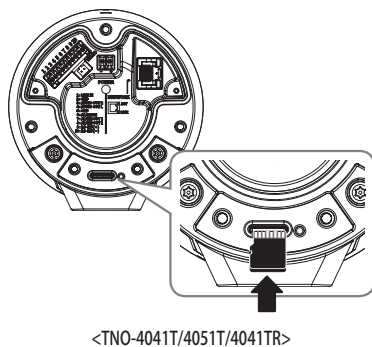
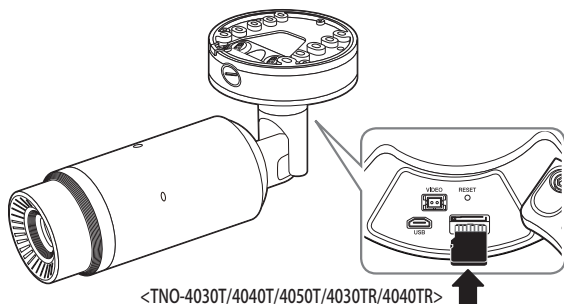


## マイクロSDメモ리카ードの挿入/取出し

- マイクロSDメモ리카ードを挿入する前に、カメラの電源ケーブルを抜いてください。
- 上下反対のままマイクロSDメモ리카ードを無理に挿入しないでください。  
無理に差し込むと、マイクロSDメモ리카ードが破損する恐れがあります。
- 雨あるいは高湿度の状態でMicroSDカードを挿入したり取り出したりすることは推奨されません。

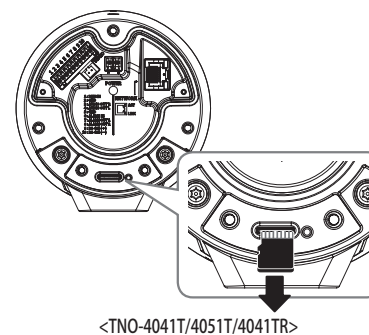
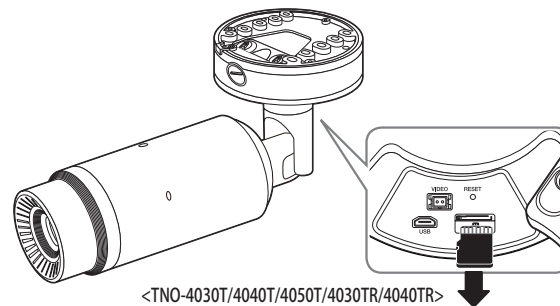
### マイクロSDメモ리카ードの挿入

図のように、MicroSDカードを矢印方向へ挿入します。



### マイクロSDメモ리카ードの取出し

図に示されているように、メモ리카ードの露出部分を慎重に押して、スロットからメモ리카ードを取り出します。



- マイクロSDメモ리카ードを強く押しすぎると、手を放したときに、カードがスロットから勢いよく飛び出す可能性があります。
- MicroSDメモ리카ードを取り外す前に、<ストレージ>でデバイスを<Off>に設定し、[適用]ボタンを押してカメラをオフにします。
- カメラのスイッチを切るか、データの入っているマイクロSDメモ리카ードを製品から抜くと、データが失われるか、または損傷を受ける場合があります。

# 取付けおよび接続

## メモ리카ード情報 (別売)

### メモ리카ードとは

メモ리카ードは、デジタルデバイスを使用して動画、音声およびテキストデータを記録および共有するために新たに開発された外部データ記憶装置です。

### 用途に応じたメモ리카ードの選択

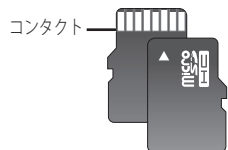
ご購入されたカメラは、マイクロ SD/SDHC/SDXCメモ리카ードに対応しています。しかし、メモ리카ードのモデルおよび型によって、互換性に障害が生じる場合があります。

以下の製造業者および種類のメモ리카ードをこのカメラで使用することを推奨します。

- 製造業者: SanDisk, Transcend
- 製品グループ: 高耐久

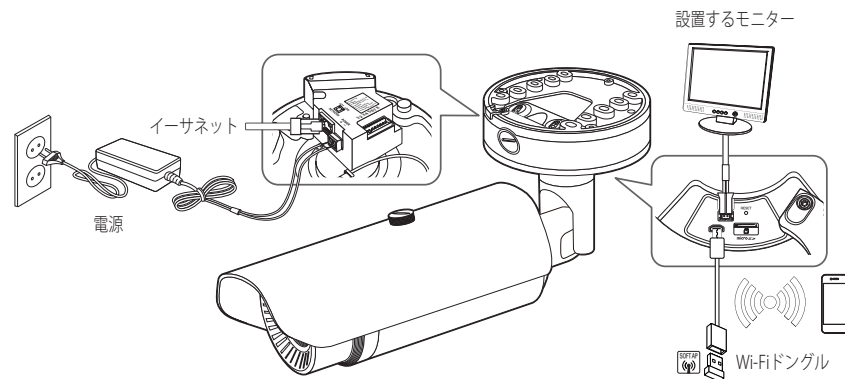
このカメラには16GB~256GB (MLCタイプ)のメモ리카ードを使用することをお勧めします。

再生機能は、メモリの処理速度によって影響を受ける場合があります。

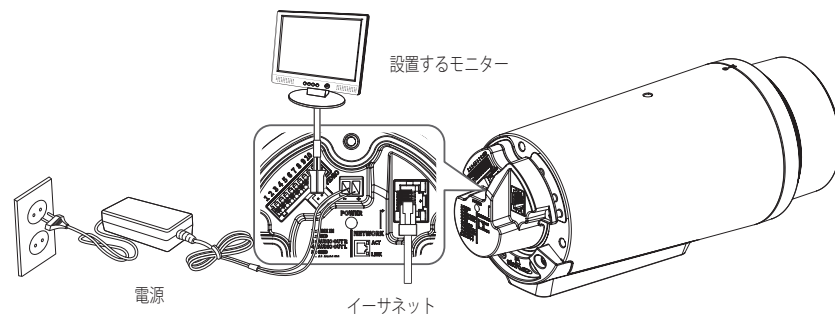


Micro SD/SDHC/SDXC

## 他のデバイスとの接続



<TNO-4030T/4040T/4050T/4030TR/4040TR>



<TNO-4041T/4051T/4041TR>

- 本製品のCVBSアウト端子は、簡単なインストールのために提供されており、監視目的にはお勧めできません。
- 本製品のMicro USBアウト端子は、簡単なインストールのために提供されており、監視目的にはお勧めできません。
- 周辺の温度が変化すると、一定間隔でおよそ1~2秒画面がフリーズする場合がありますが、正常です。画面では、校正処理が行われているだけです。

## イーサネット接続

イーサネットケーブルをローカルネットワークもしくはインターネットに接続します。

## Wi-Fi接続 (TNO-4030T/4040T/4050T/4030TR/4040TR)

### カメラ設定

1. OTGアダプタ (5ピン) とWi-Fi dongleをMicro USB端子に接続します。

### スマートフォン設定

1. Wisenetインストールアプリケーションをインストールします。
2. Wi-FiをオンにしてからカメラのSSIDを選択します。
3. Wisenetインストールアプリケーションを起動します。
4. カメラにログインすると、ビデオに接続されます。初期パスワード: 4321)
  - 初期接続中は、ログインしていなくてもビデオが再生されます。
5. スマートフォンでビデオを視聴しながら、画角を調整することができます。

### 推奨するdongle製造業者

製造業者	モデル
NETIS	WF2123 n300
EDIMAX	EW-7811Un
IP Time	N100mini
TP-LINK	TL-WN823N V1
ASUS	USB-N13
NETGEAR	WNA3100M

## 電源

ドライバーを使用して、電源ケーブルの各線 (+, -) をカメラの対応する電源ポートに接続します。

- PoEとDC 12VまたはPoEとAC 24Vの電源に同時に給電すると、外部電源から装置に給電されます(AC24V、DC12V)。
  - また、PoE対応ルーターを使用して、カメラに電源を供給することもできます。
  - IEEE 802.3afプロトコルに準拠したPoEを使用してください。
  - PoE、DC 12VおよびAC24Vで装置に給電する電源を1つだけ使用することをお勧めします。
- 電源ケーブルの接続時に、極性を逆にならないようご注意ください。
- 電源を初めてオンにすると、画面を安定させるために時間がかかります。そのため、電源を初めてオンにすると、画面校正が実行されます。
- 外部デバイスを接続する場合は、作業を進める前に外部デバイスの電源を切る必要があります。
- セットとアダプター電源ラインを最初に接続し、その次に電源ケーブルを壁のコンセントに接続します。

## 各モデルの電源ケーブルの仕様

入力電力	ワイヤータイプ(AWG)	ケーブルの長さ(最長)
DC 12V	#18	19m
	#16	30m
AC 24V	#20	26m
	#18	40m

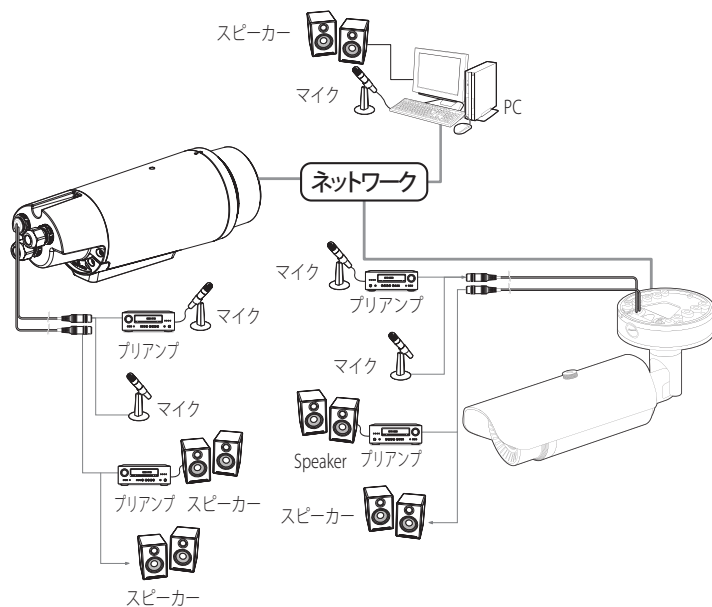
## ネットワークケーブルの仕様

アイテム	コンテンツ	備考
コネクタ	RJ45	
イーサネットケーブル	10/100Base-T UTP カテゴリ 5e	10/100 Mbps
最大距離	100M	
PoE サポート	IEEE 802.3af	



# 取付けおよび接続

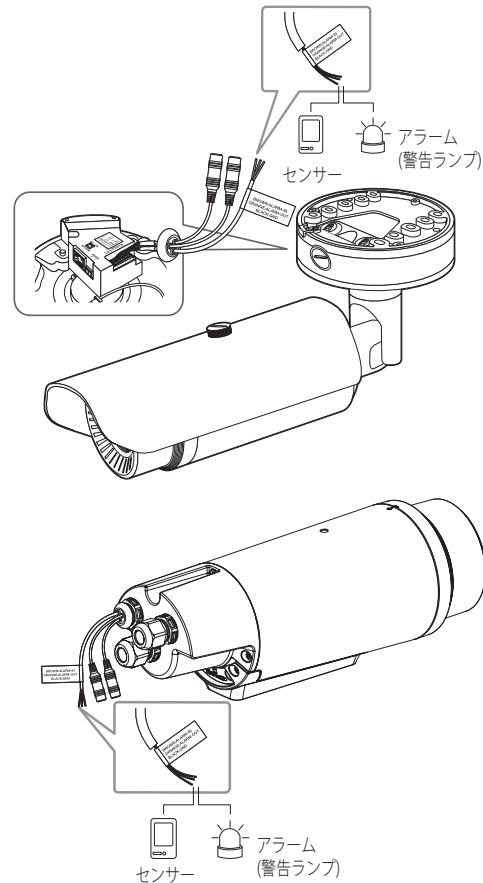
## 音声入力/出力への接続



1. カメラのAUDIO INポートにマイクか、マイクが接続されているアンプのLINE OUTポートを接続します。
  2. カメラのAUDIO OUTポートにスピーカーか、スピーカーが接続されているアンプのLINE INポートを接続します。
  3. 音声入力の仕様を確認します。
- **音声コーデック**
    - 音声入力: G.711PCM (ビットレート: 64kbps / サンプリング周波数: 8kHz)、G.726ADPCM (ビットレート: 16Kbps、24Kbps、32Kbps、40Kbps / サンプリング周波数: 8kHz)、AAC (Bit Rate: 48Kbps / Sampling Frequency: 16kHz)
    - 音声出力: G.711PCM (ビットレート: 64kbps / サンプリング周波数: 8kHz)
  - **全二重音声**
  - **音声入力**: 選択可能 (マイク/ライン入力)、サポートされる電圧: 2.5VDC (4mA)、入力インピーダンス: 2K オーム
  - **音声出力**: Line-out (3.5mmモ/ジャック)、最大出力: 1Vms
  - **インピーダンスライン出力**: 600Ω

## I/Oポートボックスへの接続

アラーム入・出ケーブルを、ポートボックスの対応する部分と接続してください。



- ALARM-IN: アラーム入力センサーや外部デイ/ナイトセンサーを接続するために使用します。
- ALARM-OUT: アラーム出力信号の接続に使用します。
- GND: アラーム入出力信号用の共通ポートです。

⚠ 電圧と電流が規格外のデバイス (例: 閃光灯やサイレン) をオープンコレクタ方式で接続すると、故障の原因となる場合があります。  
電圧と現在の仕様内容を上回っているデバイスを接続するときは、「アラーム出力配線図」を参照してください。



## RS-485 設定 (TNO-4041T/4051T/4041TR)

上記のすべての操作は、ネットワークカメラがパンニング/チルト対応レシーバに正しく接続されている場合にのみ有効になります。さらに、パンニング/チルト操作のシリアルポートを正しく指定する必要があります。

- 受信機が接続されている場合には、受信機がサポートしている機能を確認してください。レシーバまたはプロトコル仕様によっては対応できない機能があります。詳しくは下記の表を参照してください。

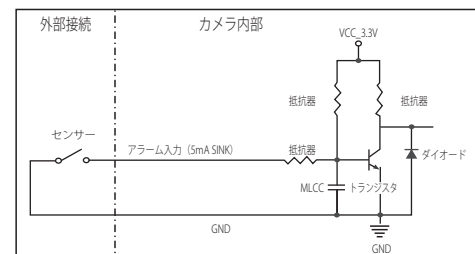
### 各プロトコルに対しサポートされる機能

プロトコル	P操作	P移動速度	T操作	T移動速度	プリセット	備考
SAMSUNG-T	0	0(1~6)	0	0(1~6)	0	
PELCO-D	0	0(1~6)	0	0(1~6)	0	
PELCO-P	0	0(1~6)	0	0(1~6)	0	
SUNGJIN	0	X	0	X	0	PT方向 (上、下、左、右)
PANASONIC	0	0(1~6)	0	0(1~6)	0	
HONEYWELL	0	0(1~6)	0	0(1~6)	0	
AD	0	0(1~6)	0	0(1~6)	0	
VICON	0	0(1~6)	0	0(1~6)	0	
GE	0	0(1~6)	0	0(1~6)	0	
BOSCH	0	0(1~6)	0	0(1~6)	X	

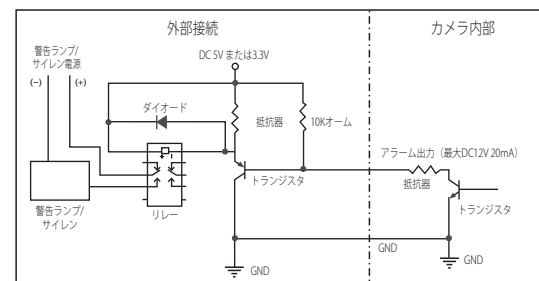
## 外部センサーの接続

センサーの各信号ライン(2つより)の一方を[ALARM IN]ポートに接続し、もう一方を[GND]ポートに接続します。

### アラーム入力配線図



### アラーム出力配線図



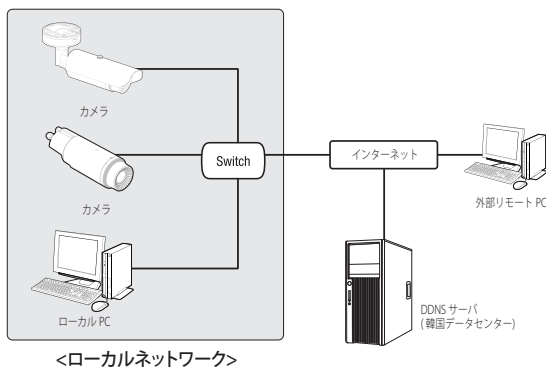
# ネットワーク接続と設定

使用中のネットワーク環境に合わせてネットワークを設定することができます。

## カメラを直接ローカルネットワークに接続する

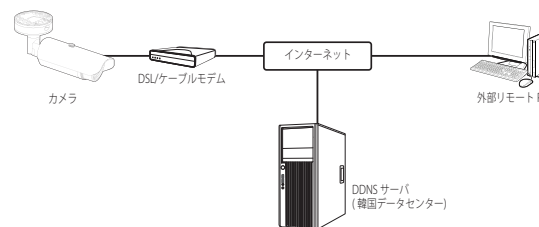
### LAN のローカル PC からカメラに接続する

1. ローカル PC でインターネットブラウザを起動します。
2. ブラウザのアドレスバーにカメラの IP アドレスを入力します。



- LAN ネットワーク範囲外の外部インターネットのリモート PC は、ポート転送がきちんと設定されていない場合やファイアウォールが有効の場合には、設置済みカメラとインターネット接続ができない場合があります。この場合、ネットワーク管理者にお問い合わせください。
- Device Manager で初期パスワード「4321」に IP アドレス、Subnet Mask、Gateway、HTTP ポート、VNP ポート、IP タイプを設定することができます。ネットワークインターフェースを変更してからセキュリティ強化のために、ウェブビューアーに接続して必ずパスワードを変更してください。
- 工場出荷時の設定で、IP アドレスが DHCP サーバーから自動的に割り当てられます。使用可能な DHCP サーバーがない場合、IP アドレスは 192.168.1.100 に設定されます。IP アドレスを変更するためには、Device Manager を使用してください。Device Manager の使い方は、「**Device Manager を使用する**」をご参照ください。(20 ページ)

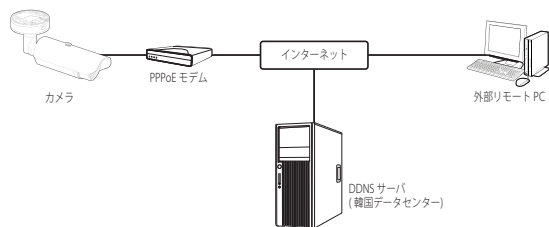
## カメラを直接 DHCP ベースの DSL/ケーブルモデムに接続する



1. ユーザーの PC をネットワークカメラに直接接続します。
2. Device Manager を使用してカメラの IP アドレスをユーザーのパソコンからインターネットブラウザで接続できる IP アドレスに変更してください。
3. インターネットブラウザを使用して Web Viewer と接続します。
4. [設定] ページに移動します。
5. [ネットワーク] - [DDNS] に移動し、DDNS の設定を行います。
6. [Basic] - [IP & ポート] へ移動し、IP 方式を [DHCP] に設定します。
7. PC から取り外したカメラを直接モデムに接続します。
8. カメラを再起動します。

- DDNS の設定方法についての情報は、ウェブビューアーのオンラインヘルプを参照してください。
- IP フォーマットの設定方法についての情報は、ウェブビューアーのオンラインヘルプを参照してください。

## PPPoEモデムへのカメラの直接接続

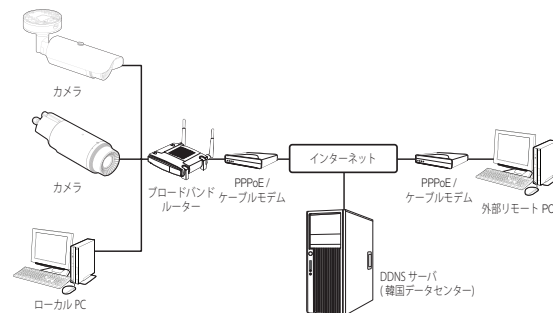


1. ユーザのPCをネットワークカメラに直接接続します。
2. Device Managerを使用してカメラのIPアドレスをユーザーのパソコンからインターネットブラウザで接続できるIPアドレスに変更してください。
3. インターネットブラウザを使用してWeb Viewerと接続します。
4. [設定]ページに移動します。
5. [ネットワーク] - [DDNS]に移動し、DDNSの設定を行います。
6. [Basic] - [IP & ポート] の設定ページへ移動し、IP方式を [PPPoE] に設定し、サービスのIDとパスワードを入力します。
7. PCから取り外したカメラを直接モデムに接続します。
8. カメラを再起動します。

- DDNSの設定方法についての情報は、ウェブビューアのオンラインヘルプを参照してください。
- IPフォーマットの設定方法についての情報は、ウェブビューアのオンラインヘルプを参照してください。

## PPPoE/ケーブルモデムでカメラとブロードバンドルーターを接続する

この方法は、ホーム、SOHO、および一般の店舗などの小規模ネットワーク環境に適しています。



### ブロードバンドルーターに接続したローカル PC のネットワーク環境の設定は

ブロードバンドルーターに接続したローカル PC のネットワーク環境の設定は、以下の手順で行ないます。

- 手順: <Network> → <Properties> → <Local Area Connection> → <General> → <Properties> → <Internet Protocol (TCP/IP)> → <Properties> → <Obtain an IP address automatically> または <Use the following IP address>。
  - <Use the following IP address> を選択する場合には、以下の手順を実行します:
    - 例1) ブロードバンドルーターのアドレス (LAN IP) が 192.168.1.1  
IP アドレス: 192.168.1.100  
サブネットマスク: 255.255.255.0  
デフォルト ゲートウェイ: 192.168.1.1
    - 例2) ブロードバンドルーターのアドレス (LAN IP) が 192.168.0.1  
IP アドレス: 192.168.0.100  
サブネットマスク: 255.255.255.0  
デフォルト ゲートウェイ: 192.168.0.1
    - 例3) ブロードバンドルーターのアドレス (LAN IP) が 192.168.xxx.1  
IP アドレス: 192.168.xxx.100  
サブネットマスク: 255.255.255.0  
デフォルト ゲートウェイ: 192.168.xxx.1
- ブロードバンドルーターのアドレスに関しては、製品のユーザガイドを参照してください。
  - ブロードバンドルーターのポートフォワーディングの詳細については、「ポートフォワード (ポートマッピング) の設定」を参照してください。(22ページ)

# ネットワーク接続と設定

## DEVICE MANAGERを使用する

- Device Manager プログラムは、ハンファテックウインのウェブサイト(<http://www.hanwha-security.com>)に接続して<技術ガイド>-<Online Tool>でダウンロードすることができます。
- Device Managerの詳しい使い方は、トップの<ヘルプ>メニューで確認することができます。

## 自動にカメラを検索する

Device ManagerがインストールされたPCと同じネットワークにカメラが接続された場合、検索機能でネットワークカメラを探すことができます。

1. Device Managerのトップで<検索>をクリックしてください。
2. 検索リストで検索したいカメラが表示されているか確認してください。
  - カメラに付着されたステッカーでMACアドレスを確認してください。

## IPアドレスを設定する

カメラのネットワーク設定を変更するためには、<状態>項目に<Login OK>と表示される必要があります。Device Managerのトップで<認証>をクリックすると、ログインできます。

### Static IPを設定する

IPアドレス&ポート情報を手動で入力して設定します。

1. 検索リストでIP設定を変更するカメラをクリックしてください。
2. Device Managerのトップで<IP割り当てる>をクリックしてください。
3. <IPアドレス手動割当>を選択してください。
  - カメラのIP情報が既存に設定されている値で表示されます。
4. IP関連項目&ポート関連項目を入力してください。

### ブロードバンドルーターを使用しない場合

ネットワークマネージャーに<IPアドレス>、<Subnet Mask>、<Gateway>の設定値をお問い合わせください。

- HTTP ポート：インターネットブラウザを使用してカメラにアクセスする際に使用します。初期設定は80です。
- VNP ポート：映像信号の送信の制御に使用され、初期値は4520です。
- RTSPポート：リアルタイム・ストリーミングを制御するポートであり、初期値は554です。

### ブロードバンドルーター使用の場合

- IP Address：ブロードバンドルーターによって指定されたIP範囲でアドレスを入力します。  
例) 192.168.1.2~254、192.168.0.2~254、192.168.XXX.2~254
- Subnet Mask：ブロードバンドルーターの<Subnet Mask>が、カメラの<Subnet Mask>となります。
- Gateway：ブロードバンドルーターの<Local IP Address>が、カメラの<Gateway>となります。

- 設定は、接続しているブロードバンドルーターのモデルによって異なる場合があります。詳細は、該当するルーターのユーザーマニュアルを参照してください。
- ブロードバンドルーターのポートフォワーディングの詳細については、「ポートフォワード (ポートマッピング)の設定」を参照してください。(22ページ)

### ブロードバンドルーターに複数のカメラが接続されている場合

IPに関する設定と、ポートに関する設定は別々に設定します。

例)

	カテゴリ	カメラ #1	カメラ #2
IP設定	IPアドレス	192.168.1.100	192.168.1.101
	Subnet Mask	255.255.255.0	255.255.255.0
	Gateway	192.168.1.1	192.168.1.1
ポート設定	HTTP ポート	8080	8081
	VNP ポート	4520	4521
	RTSP ポート	554	555

- <HTTP Port>が80以外に設定されている場合、カメラにアクセスするには、インターネットブラウザのアドレスバーで<Port>番号を設定する必要があります。  
例) <http://IPアドレス:HTTPポート>  
<http://192.168.1.100:8080>

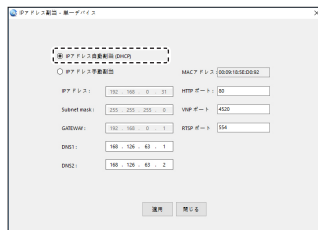
5. [適用]ボタンをクリックしてください。
6. 成功確認メッセージが表示されたら、[OK]ボタンをクリックしてください。

## ダイナミックIPを設定する

IPアドレスをDHCPで自動的に割り当てられます。

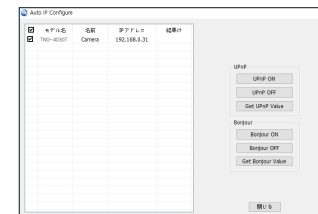
- 動的IP環境の例
  - カメラに接続しているブロードバンドルーターが、DHCPサーバーでIPアドレスを割り当てられている場合
  - DHCPプロトコルを使用して直接カメラをモデムに接続する場合
  - IPがLAN経由で内部DHCPサーバーに割り当てられている場合

1. 検索リストでIP設定を変更するカメラをクリックしてください。
2. Device Managerのトップで<IP割り当て>をクリックしてください。
3. <IPアドレス自動割当(DHCP)>を選択してください。
4. [適用]ボタンをクリックしてください。
5. 成功確認メッセージが表示されたら、[OK]ボタンをクリックしてください。



## 自動にIPを設定する

1. 検索リストでIPを自動に設定するカメラをクリックしてください。
2. Device Managerのトップで< + >をクリックしてください。
  - デバイス設定メニューが表示されます。
3. デバイス設定メニューで<Auto IP Configure (IP自動設定)>をクリックしてください。
4. [閉じる]ボタンをクリックしてください。



## 手動でカメラを登録する

検索機能でカメラを探せなかったり、外部ネットワークにカメラを接続した場合、IP情報を手動で入力してリモートでカメラを探して登録することができます。

1. Device Managerのトップで<デバイス追加> - <装備の手動登録>をクリックしてください。
2. 検索するIPアドレス範囲を入力してください。
3. 登録するカメラの<モデル名>を選択してHTTPポート、VNPポート、ID、パスワードを入力してください。
4. [登録]ボタンをクリックしてください。
5. リストでカメラが登録されているか確認してください。
  - カメラに付着されたステッカーでMACアドレスを確認してください。



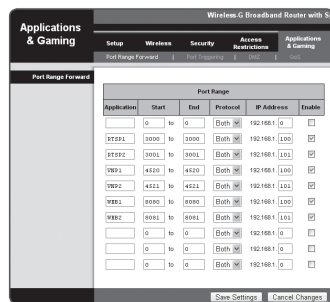
# ネットワーク接続と設定

## ポートフォワード(ポートマッピング)の設定

カメラを接続したままブロードバンドルーターをインストールした場合は、ブロードバンドルーター上でポート範囲フォワードを設定し、ルーター内のカメラにリモートPCからアクセスできるようにする必要があります。

### 手動ポートフォワード

- ブロードバンドルーターの設定メニューから**Applications & Gaming** - **Port Range Forward**を選択します。サードパーティのブロードバンドルーター用にポートフォワードを設定するには、ブロードバンドルーターのユーザーマニュアルを参照してください。
- ブロードバンドルーターに接続されている各カメラ用の、**<TCP>**と**<UDP Port>**を選択します。IPルーターに設定する各ポートの数字は、カメラWeb Viewerの**設定** - **<Basic>** - **<IP & ポート>**に指定されるポート番号に合わせて設定しなければなりません。
- 完了後、**[Save Settings]**をクリックします。設定が保存されます。

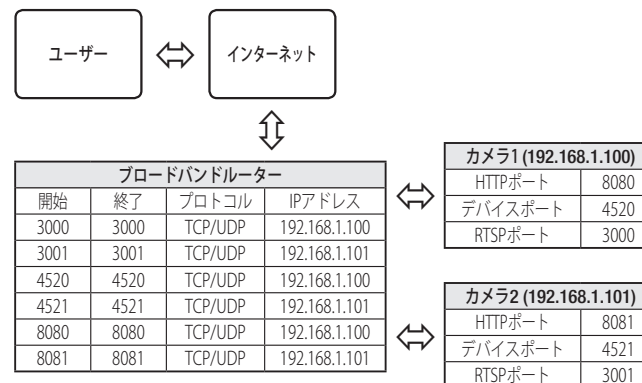


- ポートフォワーディング設定の説明は、CISCO IPのルーターで設定した例示です。
- 設定は、接続しているブロードバンドルーターのモデルによって異なる場合があります。詳細は、該当するルーターのユーザーマニュアルを参照してください。

## 複数のネットワークカメラに関するポートフォワード範囲設定

- ブロードバンドルーターデバイスの設定Webページで、ポートフォワーディングのルールを設定することができます。
- ユーザーは、カメラ設定画面を使って各ポートを変更できます。

カメラ1とカメラ2がルーターに接続されている場合:




- ルーターがUPnP (ユニバーサルプラグアンドプレイ) 機能をサポートしている場合、ポートフォワーディングを追加ルータの設定なしで行うことができます。ネットワークカメラ接続後、メニューから、**設定 -> ネットワーク -> DDNS**の**<Wisenet DDNS>**の**<クイック接続>**のチェックボックスを選択します。

## 共有ローカルPCからカメラへの接続

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1. Device Managerを起動してください。  
接続されているカメラをスキャンし、そのリストを表示します。
2. アクセスするカメラをダブルクリックします。  
インターネットブラウザが起動し、カメラに接続されます。

 ■ インターネットブラウザのアドレスバーに検出されたカメラのIPアドレスを入力し、カメラにアクセスすることもできます。

## リモートPCからインターネット経由でのカメラへの接続

---

IPルーターのネットワーククラスター外部のリモートパソコンでは、ユーザーがカメラのDDNS URLを用いてIPルーターのネットワーク内部にあるカメラにアクセスすることができます。

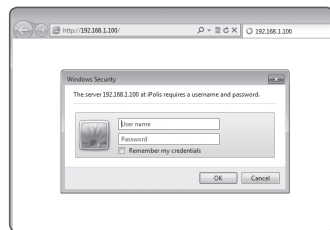
1. ブロードバンドルーターのネットワーク内のカメラへアクセスする前に、ブロードバンドルーターにポートフォワードを設定しておく必要があります。
2. リモートPCから、インターネットブラウザを起動しカメラのDDNS URLアドレスを入力するか、アドレスバーでブロードバンドルーターのIPアドレスを入力します。  
例) <http://ddns.hanwha-security.com/ID>

 ■ Wisenet DDNSを有効にするためには、Wisenet DDNSのウェブサイト(<http://ddns.hanwha-security.com>)で会員登録した後、**[My DDNS]>[製品登録]**で先に製品を登録する必要があります。

## カメラへの接続

### 通常の方法

1. インターネットブラウザを起動します。
2. アドレスバーにカメラのIPアドレスを入力します。  
例) IPアドレス(IPv4): 192.168.1.100 → http://192.168.1.100  
- ログインダイアログが表示されます。  
・IPアドレス(IPv6): 2001:230:abcd:ffff:0000:0000:ffff:1111  
→ http://[2001:230:abcd:ffff:0000:0000:ffff:1111] - ログインダイアログが表示されます。



### HTTPポートが80以外の場合

1. インターネットブラウザを起動します。
2. アドレスバーにカメラのIPアドレスとHTTPのポート番号を入力します。  
例) IPアドレス: 192.168.1.100:HTTPのポート番号(8080)  
→ http://192.168.1.100:8080 - ログインダイアログが表示されます。

### URLを使用する場合

1. インターネットブラウザを起動します。
2. アドレスバーにカメラのDDNS URLを入力します。  
例) URLアドレス: http://ddns.hanwha-security.com/ID  
- ログインダイアログが表示されます。

■ ネットワーク接続はLANのみの環境では無効になります。

### DDNSアドレスを確認するには

カメラが直接DHCPケーブルモデム、DSLモデムまたはPPPoEモデムと接続している場合には、ISP(インターネットサービスプロバイダ)サーバーに接続するたびにネットワークのIPアドレスが変更されます。その場合、DDNSによるIPアドレスの変更は通知されません。

動的なIPベースのデバイスをDDNSサーバーに登録すると、そのデバイスにアクセスするときに、変更されたIPを簡単に確認することができます。

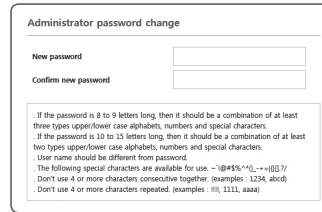
使用するデバイスを<DDNS>サーバーに登録するには、http://ddns.hanwha-security.comにアクセスして最初にデバイスを登録し、Web Viewerの<ネットワーク> - <DDNS>を<Wisenet DDNS>に設定し、DDNS登録に使用した<製品ID>を指定します。

## パスワード設定

本製品を初めて使用する場合、ログインパスワードを登録する必要があります。

“パスワード変更”ウィンドウが表示されましたら、新しいパスワードを入力します。

- 新しいパスワードが8~9桁の場合、以下のうち3種類以上を使用する必要があります：大文字/小文字、数字、特殊文字。パスワードが10~15桁の場合、2種類以上を使用する必要があります。
  - 認められている特別文字：~!@#%&^\*\_+=|00./?
- 安全性を高めるため、同じ文字を繰り返したり、キーボード上の連続した文字を入力したりするのはお勧めしません。
- パスワードをなくした場合、[RESET]を押して製品を初期化します。そのため、メモ帳を利用したり、記憶したりして、パスワードをなくさないようにしてください。



## ログイン

カメラにアクセスするたびに、ログインウィンドウが表示されます。ユーザーIDとパスワードを入力してカメラにアクセスします。

1. <User name>入力ボックスに“admin”と入力します。  
管理者ID“admin”は、確定されており変更できません。
  2. <Password>入力欄に入力します。
  3. [OK]をクリックします。  
正常にログインすると、Live Viewerの画面が表示されます。
- カメラのWebビューアーにアクセスする場合は、画像データが暗号化されているか確認し、セキュリティに特にご注意ください。
  - 入力完了時に、“Remember my credentials”オプションをチェックしておくと、次回からはログイン情報の入力を求められることなく自動的にログインします。
  - 画面サイズが100%である場合、映像画質が最高の状態になります。倍率を小さくすると、境界線上の画像がカットされます。



## カメラ・ウェブビューアーの設定

1. [設定 (⚙)]アイコンをクリックします。
2. 設定画面が現れます。
3. カメラの基本情報、ビデオ、オーディオ、ネットワーク、イベント、分析、ネットワーク全体のシステムの設定を構成することができます。
4. <ヘルプ (📄)> をクリックして、それぞれの機能の詳細説明を表示します。



仕様

項目	説明					
	TNO-4030T	TNO-4040T	TNO-4050T	TNO-4041T	TNO-4051T	
映像	撮像素子	非冷却マイクロボロメータ				
	ピクセルサイズ	17 μm				
	有効画素数	640x480				
	NETD	<50mK				
	ビデオ出力	CVBS: 1.0Vp-p/75Ωコンポジット、720x480(N)、720x576(P)、取付け用 USB: Micro USBタイプB、1280x720、インストール用		CVBS: 1.0 Vp-p / 75Ω コンポジット、720x480(N)、720x576(P)、取付け用		
レンズ	焦点距離(ズーム倍率)	13mm 固定	19mm 固定	35mm 固定	19mm 固定	35mm 固定
	最大口径比	F1.0				
	画角	H:48.6°/ V:36.4°/D:61.6°	H:32°/V:24.3°/ D:39.2°	H:17.2°/V:13°/ D:22°	H:32°/V:24.3°/ D:39.2°	H:17.2°/V:13°/ D:22°
	焦点制御	固定				
	最短被写体距離	5m	11m	36m	11m	36m
	マウントタイプ	Board-in type				
操作関係	カメラタイトル	オン/オフ - WW: 英語/数字/特殊文字 - 共通: マルチライン(最大5)、カラー(グレー/グリーン/レッド/ブルー/ブラック/ホワイト)、透明、解像度ごとにオートスケール				
	デジタル手ブレ補正	オフ/オン(ジャイロあり)				
	モーション検知	オフ/オン(8角形ゾーン各8)、ハンドオーバー				
	プライバシーマスク	オフ / オン (各32, 形ゾーン) - カラー: グレー、グリーン、レッド、ブルー、ブラック、ホワイト - モザイク				
	フリップ/ミラー	フリップ: オン/オフ ミラー: オン/オフ 玄関: 90°/270°				

項目	説明					
	TNO-4030T	TNO-4040T	TNO-4050T	TNO-4041T	TNO-4051T	
操作関係	ビデオ&オーディオ解析	タンパリング、うろつく、方向検知、バーチャルライン、出/入検知、発生/消滅検知、音声検知、モーション検知、サウンド分類、衝撃検知、温度変化検知				
	アラーム入出力	入力1個/出力2				
	リモートコントロール	-			RS485	
	RS-485プロトコル	-			Pelco D/P, Samsung T, Honeywell, Bosch, Panasonic, Sungin, AD, Vicon, GE	
	アラームトリガー	アラーム入力、モーション検出、ビデオ&オーディオ解析、ネットワーク接続解除				
	アラームイベント	<ul style="list-style-type: none"> <li>FTP、電子メールによるファイルのアップロード</li> <li>電子メール、による通知</li> <li>ネットワーク切断時およびイベント時でのローカルストレージ(SD/SDHC/SDXC)またはNAS録画</li> <li>外部出力</li> </ul>				
	オーディオ入力	選択可能(マイク入力/ライン入力) 供給電圧: 2.5VDC(4mA)、入力インピーダンス: 約2Kオーム				
	オーディオ出力	ライン出力、最大出力: 1Vrms				
	ピクセルカウンター	サポート				
	ネットワーク	イーサネット	RJ-45 (10/100BASE-T)			
ビデオ圧縮フォーマット		H.265/H.264 (MPEG-4 Part 10/AVC) : メイン/ベースライン/ハイ、モーションJPEG				
解像度		640x480, 640x360, 320x240				
最大フレームレート		H.265/H.264: すべての解像度で最大30fps Motion JPEG: 最大 30fps				
WiseStream II		サポート				
ビデオ品質調整	H.264/H.265: ターゲットビットレートレベル制御 MJPEG: ターゲットビットレートレベル制御					

項目	説明				
	TNO-4030T	TNO-4040T	TNO-4050T	TNO-4041T	TNO-4051T
ビットレート制御方式	H.264/H.265: CBR または VBR Motion JPEG: VBR				
ストリーミング機能	マルチストリーミング(最大10プロファイル)				
音声圧縮フォーマット	G.711 μ-法/G.726 選択可 G.726 (ADPCM) 8KHz, G.711 8KHz G.726: 16Kbps, 24Kbps, 32Kbps, 40Kbps AAC-LC: 8/16/32/48KHzで48Kbps				
音声通信	双方向				
IP	IPv4, IPv6				
プロトコル	TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP, RTSP, NTP, HTTP, HTTPS, SSL/TLS, DHCP, PPPoE, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, PIM-SM, UPnP, Bonjour, LLDP				
セキュリティ	HTTPS(SSL) ログイン認証 ダイジェストログイン認証 IPアドレスフィルタリング ユーザーアクセスログ 802.1X認証方式 (EAP-TLS, EAP-LEAP)				
ストリーミング方式	ユニキャスト/マルチキャスト				
最大ユーザーアクセス	ユニキャストモードでは20ユーザー				
エッジストレージ	SD/SDHC/SDXC (最大 256 GB) - SD/SDHC/SDXCメモリーカードに記録されるモーション画像をダウンロードできません。 NAS(ネットワークアタッチトストレージ) インスタント録画用ローカルPC				
アプリケーション・プログラミング・インターフェース	ONVIF Profile S/G SUNAPI(HTTP API) オープンプラットフォーム				
Webページの言語	英語、韓国語、フランス語、ドイツ語、スペイン語、イタリア語、中国語、ロシア語、日本語、スウェーデン語、ポルトガル語、チェコ語、ポーランド語、トルコ語、オランダ語、ハンガリー語、ギリシャ語				

ネットワーク

項目	説明				
	TNO-4030T	TNO-4040T	TNO-4050T	TNO-4041T	TNO-4051T
ネットワーク	Web Viewer	対応OS: Windows 7 / 8.1 / 10, MAC OS X 10.10, 10.11, 10.12 推奨するブラウザ: Google Chrome 対応ブラウザ: MS Explorer 11, MS Edge, Mozilla Firefox (Windows 64ビットのみ), Apple Safari (Mac OS Xでのみサポート)			
	集中管理ソフトウェア	SmartViewer, SSM			
環境関係	動作温度/湿度	-40°C ~ +60°C (-40°F ~ +140°F) / RH90%以下			
	保存温度/湿度	-50°C ~ +60°C (-58°F ~ +140°F) / RH90%以下			
	保護等級	IP66, NEMA 4X			
	ハンダル抵抗	IK10	-	IK10	-
電気関係	入力電圧/電流	24VAC, 12VDC, PoE(IEEE802.3af)			
	消費電力	Max.10.5W(AC24V), Max.9W(DC12V), Max.10W(PoE) 標準8.9W(AC24V)、標準7.5W(DC12V)、標準8.6W(PoE)			
メカニカル	色/材質	ホワイト(RAL-9003)/アルミニウム			
	寸法(ØxH)	Ø101.97 x H401.8mm		Ø101.97 x H309mm	
	重量	3,124g	3,126g	2,452g	

項目	説明			
	TNO-4030TR	TNO-4040TR	TNO-4041TR	
映像	撮像素子	非冷却マイクロボロメータ		
	ピクセルサイズ	17 $\mu$ m		
	有効画素数	640x480		
	NETD	<50mK		
	ビデオ出力	CVBS: 1.0Vp-p/75 $\Omega$ コンポジット、720x480(N)、720x576(P)、取付け用 USB: Micro USBタイプB、1280X720、インストール用	CVBS: 1.0Vp-p / 75 $\Omega$ コンポジット、720x480(N)、720x576(P)、取付け用	
レンズ	焦点距離(ズーム倍率)	13mm 固定	19mm 固定	
	最大口径比	F1.0		
	画角	H:48.6°/V:36.4°/D:61.6°	H:32°/V:24.3°/D:39.2°	
	焦点制御	固定		
	最短被写体距離	5m	11m	
	マウントタイプ	Board-in type		
温度検知	温度検知範囲	-20°C ~ 130°C (-4°F ~ 266°F)		
	温度の正確度	$\pm 5^\circ\text{C}$ ( $\leq 100^\circ\text{C}$ ), $\pm 20\%$ ( $> 100^\circ\text{C}$ )		
	温度検知	Off/On(3個の四角)		
	追加機能	ハイブリッド・パレット、スポット温度チェック		
操作関係	カメラタイトル	オン/オフ - W/W: 英語/数字/特殊文字 - 共通: マルチライン(最大5)、カラー(グレー/グリーン/レッド/ブルー/ブラック/ホワイト)、透明、解像度ごとにオートスケール		
	デジタル手ブレ補正	オフ/オン(ジャイロあり)		
	モーション検知	オフ/オン(8角形ゾーン各8)、ハンドオーバー		
	プライバシーマスク	オフ/オン(各32、形ゾーン) - カラー: グレー、グリーン、レッド、ブルー、ブラック、ホワイト - モザイク		
	フリップ/ミラー	フリップ: オン/オフ ミラー: オン/オフ 玄関: 90°/270°	フリップ: オン/オフ ミラー: オン/オフ	

項目	説明			
	TNO-4030TR	TNO-4040TR	TNO-4041TR	
操作関係	ビデオ&オーディオ解析	タンパリング、うろつく、方向検知、バーチャルライン、出/入検知、発生/消滅検知、音声検知、モーション検知、サウンド分類、衝撃検知、温度検知		
	アラーム入出力	入力1個/出力2		
	リモートコントロール	-	RS485	
	RS-485プロトコル	-	Pelco D/P, Samsung T, Honeywell, Bosch, Panasonic, Sungin, AD, Vicon, GE	
	アラームトリガー	アラーム入力、モーション検出、ビデオ&オーディオ解析、ネットワーク接続解除		
	アラームイベント	<ul style="list-style-type: none"> <li>FTP、電子メールによるファイルのアップロード</li> <li>電子メールによる通知</li> <li>ネットワーク切断時およびイベント時でのローカルストレージ(SD/SDHC/SDXC)またはNAS録画</li> <li>外部出力</li> </ul>		
ネットワーク	オーディオ入力	選択可能(マイク入力/ライン入力) 供給電圧: 2.5VDC (4mA)、入力インピーダンス: 約2Kオーム		
	オーディオ出力	ライン出力、最大出力: 1Vrms		
	ピクセルカウンター	サポート		
	イーサネット	RJ-45 (10/100BASE-T)		
	ビデオ圧縮フォーマット	H.265/H.264 (MPEG-4 Part 10/AVC) : メイン/ベースライン/ハイ、モーションJPEG		
ネットワーク	解像度	640x480, 640x360, 320x240		
	最大フレームレート	H.265/H.264: すべての解像度で最大30fps Motion JPEG: 最大 30fps		
	WiseStream II	サポート		
	ビデオ品質調整	H.264/H.265: ターゲットビットレートレベル制御 MJPEG: ターゲットビットレートレベル制御		

項目	説明		
	TNO-4030TR	TNO-4040TR	TNO-4041TR
ビットレート制御方式	H.264/H.265 : CBR または VBR Motion JPEG : VBR		
ストリーミング機能	マルチストリーミング (最大10プロファイル)		
音声圧縮フォーマット	G.711 $\mu$ -法/G.726 選択可 G.726 (ADPCM) 8KHz, G.711 8KHz G.726 : 16Kbps, 24Kbps, 32Kbps, 40Kbps AAC-LC : 8/16/32/48KHzで48Kbps		
音声通信	双方向		
IP	IPv4, IPv6		
プロトコル	TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP, RTSP, NTP, HTTP, HTTPS, SSL/TLS, DHCP, PPPoE, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, PIM-SM, UPnP, Bonjour, LLDP		
セキュリティ	HTTPS (SSL) ログイン認証 ダイジェストログイン認証 IPアドレスフィルタリング ユーザーアクセスログ 802.1X認証方式 (EAP-TLS, EAP-LEAP)		
ストリーミング方式	ユニキャスト/マルチキャスト		
最大ユーザーアクセス	ユニキャストモードでは20ユーザー		
エッジストレージ	SD/SDHC/SDXC (最大 256 GB) - SD/SDHC/SDXCメモリーカードに記録されるモーション画像をダウンロードできます。 NAS(ネットワークアタッチトストレージ) インスタント録画用ローカルPC		
アプリケーション・プログラミング・インターフェース	ONVIF Profile S/G SUNAPI(HTTP API) オープンプラットフォーム		
Webページの言語	英語、韓国語、フランス語、ドイツ語、スペイン語、イタリア語、中国語、ロシア語、日本語、スウェーデン語、ポルトガル語、チェコ語、ポーランド語、トルコ語、オランダ語、ハンガリー語、ギリシャ語		

ネットワーク

項目	説明		
	TNO-4030TR	TNO-4040TR	TNO-4041TR
ネットワーク	Web Viewer	対応OS : Windows 7 / 8.1 / 10, MAC OS X 10.10, 10.11, 10.12 推奨するブラウザ : Google Chrome 対応ブラウザ : MS Explorer 11, MS Edge, Mozilla Firefox (Windows 64ビットのみ), Apple Safari (Mac OS Xでのみサポート)	
	集中管理ソフトウェア	SmartViewer, SSM	
環境関係	動作温度/湿度	-40°C ~ +60°C (-40°F ~ +140°F) / RH90%以下	
	保存温度/湿度	-50°C ~ +60°C (-58°F ~ +140°F) / RH90%以下	
	保護等級	IP66, NEMA 4X	
	ハンダ抵抗	IK10	
電気関係	入力電圧/電流	24VAC, 12VDC, PoE(IEEE802.3af)	
	消費電力	Max.10.5W(AC24V), Max.9W(DC12V), Max.10W(PoE) 標準8.9W(AC24V)、標準7.5W(DC12V)、標準8.6W(PoE)	
メカニカル	色/材質	ホワイト(RAL-9003)/アルミニウム	
	寸法 (ØxH)	Ø101.97 x H401.8mm	
	重量	3,124g	3,126g

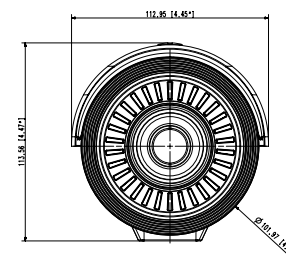
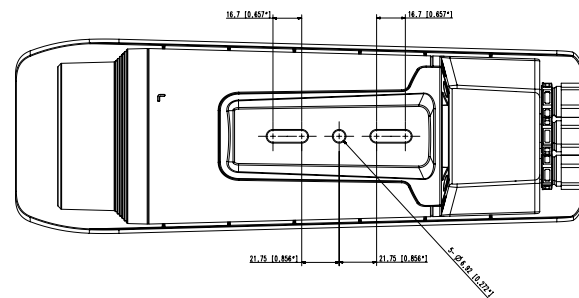
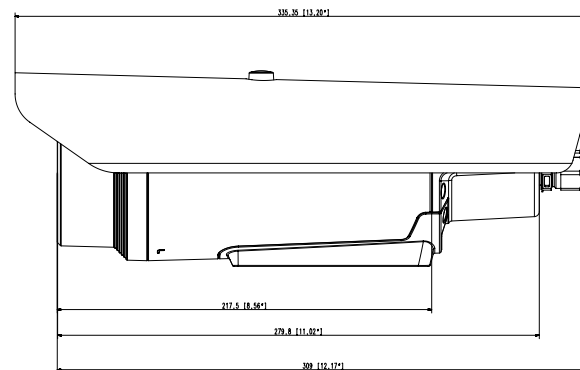
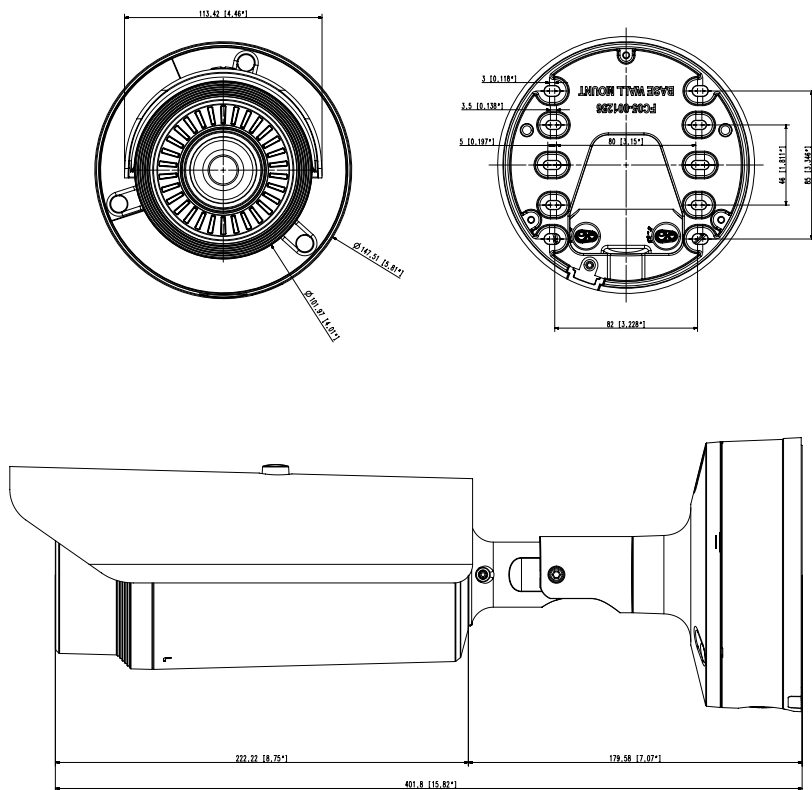
製品ビュー

TNO-4041T/4051T/4041TR

単位: mm(インチ)

TNO-4030T/4040T/4050T/4030TR/4040TR

単位: mm(インチ)



## トラブルシューティング

問題	解決策
Windows 10ユーザーがChromeまたはFirefoxからウェブビューアにアクセスする場合、マイクロフォンの音声ボリュームは周期的に変わります。	<ul style="list-style-type: none"> <li>これは、マイクロフォンのドライバがRealtekドライバに設定している場合に生じます。High Definition Audioデバイス (Windowsの標準ドライバ) またはサードパーティ製のドライバをマイクロフォン用のドライバとしてインストールします。</li> </ul>
Safariを使用してHTTPS経由でプラグインフリーのWeb Viewerにアクセスすると、映像は表示されません。	<ul style="list-style-type: none"> <li>https初回接続時に表示されるウェブサイトの認証ポップアップで&lt;証明書の表示&gt;をクリックした後、&lt;Webビューアの設定IPに接続する際、常に信頼する&gt;の項目のチェックボックスを選択してください。</li> <li>以下のメッセージウィンドウで「次へ」を選択した後にWeb Viewerでの表示に失敗する場合、commandキー + Qを押してSafariブラウザを終了し、再度アクセスして上述の手順に従います。</li> </ul>
ウェブブラウザからカメラにアクセスできない。	<ul style="list-style-type: none"> <li>カメラのネットワーク設定が適切を確認します。</li> <li>ネットワークケーブルがすべてきちんと接続されているか確認します。</li> <li>DHCP を使用して接続した場合、カメラが問題なく動的 IPアドレスを取得できたか確認します。</li> <li>カメラがブロードバンドルーターに接続している場合、ポート転送がきちんと設定されているか確認します。</li> </ul>
閲覧中にビューアが遮断された。	<ul style="list-style-type: none"> <li>カメラまたはネットワーク設定に変更が生じた場合、接続済みビューアは遮断されます。</li> <li>ネットワーク接続をすべて確認します。</li> <li>カメラが PPPoE 上で接続している場合、ネットワーク環境の不具合が原因でビューアが遮断された可能性があります。</li> </ul>
Device Managerプログラムでネットワークに接続されたカメラが検索できません。	<ul style="list-style-type: none"> <li>使用中の PC のファイアウォールを無効にし、カメラを再検索してください。</li> </ul>
画像がオーバーラップする。	<ul style="list-style-type: none"> <li>複数のカメラが個々のアドレスではなく、単一のマルチキャストアドレスに設定されているか確認します。複数のカメラが単一アドレスを使用すると、画像がオーバーラップする原因になります。</li> </ul>
画像が表示されない。	<ul style="list-style-type: none"> <li>送信方法がマルチキャストに設定されている場合、カメラが接続しているLANにマルチキャストに対応しているルータがあるか確認します。</li> </ul>

問題	解決策
音声入力を設定している場合でも、音声は録音されません。	<ul style="list-style-type: none"> <li>&lt;基本&gt; - &lt;ビデオプロファイル&gt; の &lt;音声入力&gt; チェックボックスを有効にしなければなりません。</li> </ul>
<アナリティクス>の<モーション検知>は<イベント>に設定されていますが、分析イベントが発生したときであっても、通知用のEメールは到着しません。	<ul style="list-style-type: none"> <li>設定を次の順序で確認します。 <ul style="list-style-type: none"> <li>A. &lt;日付&amp;時間&gt;設定をチェックします。</li> <li>B. &lt;モーション検知&gt;が&lt;使用&gt;に設定されていることを確認します。</li> <li>C. &lt;イベント設定&gt;メニューの&lt;E-mail&gt;オプションが選択されて使用可能になっているかどうか確認してください。</li> </ul> </li> </ul>
インテリジェント映像分析イベントが生成されていても、アラーム出力ポートに信号が検出されません。	<ul style="list-style-type: none"> <li>アラーム出力ポートの設定をチェックしてください。</li> </ul>
Micro SDメモ리카ードに録画できません。	<ul style="list-style-type: none"> <li>メモ리카ードに問題がないか確認してください。</li> </ul>
Micro SDメモ리카ードを挿入しても、カメラが正しく動作しません。	<ul style="list-style-type: none"> <li>メモ리카ードが正しい方向で挿入されているか確認してください。他のデバイスで初期化されたメモ리카ードの場合は、このカメラ装置で正常に動作しない可能性があります。</li> <li>メモ리카ードを&lt;設定&gt; → &lt;イベント&gt; → &lt;ストレージ&gt;メニューで再度初期化してください。</li> </ul>
NASに記録できません。	<ul style="list-style-type: none"> <li>NASに登録した情報が正しいことを確認します。</li> </ul>
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iptables-1.4.21	GPL 2.0	<a href="http://ftp.netfilter.org/pub/iptables">http://ftp.netfilter.org/pub/iptables</a>
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mi-diag-2.11	GPL 2.0	
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generated from the IJG code, this does not limit you more than the foregoing paragraphs do.

The Unix configuration script "configure" was produced with GNU Autoconf. It is copyright by the Free Software Foundation but is freely distributable. The same holds for its supporting scripts (config.guess, config.sub, ltconfig, ltmain. sh). Another support script, install-sh, is copyright by M.I.T. but is also freely distributable.

It appears that the arithmetic coding option of the JPEG spec is covered by patents owned by IBM, AT&T, and Mitsubishi. Hence arithmetic coding cannot legally be used without obtaining one or more licenses. For this reason, support for arithmetic coding has been removed from the free JPEG software. (Since arithmetic coding provides only a marginal gain over the unpatented Huffman mode, it is unlikely that very many implementations will support it.) So far as we are aware, there are no patent restrictions on the remaining code.

The IJG distribution formerly included code to read and write GIF files. To avoid entanglement with the Unisys LZW patent, GIF reading support has been removed altogether, and the GIF writer has been simplified to produce "uncompressed GIFs". This technique does not use the LZW algorithm; the resulting GIF files are larger than usual, but are readable by all standard GIF decoders.

We are required to state that

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### T-License [License Agreement for Source Code of T-Kernel]

established by T-Engine Forum  
on January 23, 2004  
revised on June 17, 2004  
revised on December 21, 2006  
revised on March 24, 2009

#### Article 1. Scope of License Agreement

1. This License Agreement sets forth copyrights and the terms and conditions of use applicable to the source code of T-Kernel distributed by T-Engine Forum and any derivative work created therefrom.

#### Article 2. Definition

1. "T-Kernel" means a real-time operating system controlled and distributed by T-Engine Forum on behalf of the copyright holder thereof.
2. "Source Code" means a source program, including related comments and documentations, for the T-Kernel and the Ported Source Code defined in Article 2.8 which is registered with T-Engine Forum.
3. "Hardware-dependent Part" means the part of the Source Code which depends on hardware and needs to be changed when the Source Code is ported and operated on the target hardware, and is designated and separated as such part.
4. "Compiler-dependent Part" means the part of the Source Code which depends on compiler and needs to be changed when the Source Code is ported and operated on the target hardware, and is designated and separated as such part.
5. "Header File" means the part of the Source Code which contains definitions necessary to develop application programs.
6. "T-Engine Hardware" means the hardware which is manufactured in accordance with the T-Engine Hardware specifications or the  $\mu$ T-Engine Hardware specifications issued by T-Engine Forum, and registered with T-Engine Forum.
7. "Similar Hardware to T-Engine Hardware" means any hardware (including software which emulates hardware) other than that defined in Article 2.6 above, on which the T-Kernel can be operated.
8. "Ported Source Code" means a source program produced from the Source Code by modifying only its Hardwaredependent Part and/or Compiler-dependent Part to enable it to be operated on the T-Engine Hardware or the Similar Hardware to T-Engine Hardware. The Ported Source Code which is registered with T-Engine Forum shall be included in the Source Code.
9. "Modified Source Code" means a source program modified from the Source Code for the purpose of improving its performance, increasing or decreasing its function, and the like. The Ported Source Code shall not be included in the Modified Source Code.
10. "Binary Code" means an executable code form which is created by compiling programs, which include all or part of the Source Code or the Modified Source Code.
11. "Derivative Work" means the Modified Source Code or the Binary Code.
12. "Embedded Product" means any product which operates with executable code form of the Source Code, the Modified Source Code or the Binary Code loaded on its hardware.
13. "End User" means a consumer who uses the Embedded Product.
14. "System Developer" means any person who develops the Embedded Product by itself or has a third party develop the same, and provides, whether with or without payment, the End User with the Embedded Product.
15. "Distributor of Modification" means any person who produces the Modified Source Code and, whether with or without payment, distributes the same to any third party.
16. "Patch for Modification" means a difference, program, system, or the like in order to create the Modified Source Code from the Source Code or the Binary

Code thereof.

17. "Vicarious Execution of Patch Processing" means vicarious execution service to create the Modified Source Code applying the Patch for Modification to the Source Code or the Binary Code thereof.

18. "Source Code User" means a person who uses the Source Code.

19. "Distribution" means any of the following acts:

1. to transmit a work to a large number of specific persons through the Internet communication, broadcasting, and the like;
2. to transmit a work to the general public through the Internet communication, broadcasting, and the like automatically in response to a request from the public; and
3. to distribute a copy of a work to the general public or a large number of specific persons.

#### Article 3. Copyright

1. The copyrights of the Source Code shall be owned by Ken Sakamura.

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1. As provided for in this Article, T-Engine Forum shall provide, and grant a license to use, the Source Code free of charge to any person who has taken the necessary procedure for registration as prescribed by T-Engine Forum and agreed to the T-License.

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3. to run the Source Code modified in accordance with the provision of Article 4.3 (1) above for its own research, development and the like.
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4. In accordance with the license granted under Article 4.1 above, the System Developer may perform the following acts:

1. to perform any and all acts set forth in the Article 4.3 above.
2. to develop and manufacture the Embedded Product containing the Binary Code, and, whether with or without payment, provide the End User with the same and make the Binary Code available to the End User on the Embedded Product.

5. The Source Code User and the System Developer shall be obligated to give a notice that the Source Code is used, in such a way as separately specified by T-Engine Forum, when they use the Source Code or the Binary Code, or make the Binary Code available for the End User on the Embedded Product.

#### Article 5. Distribution of Modified Source Code

1. Any of A- members of T-Engine Forum may become the Distributor of Modification by obtaining the approval of T-Engine Forum through the registration procedure as prescribed by the Forum provided that only the department of the A- member which has taken the registration procedure may distribute the Modified Source Code in such a way as provided for in this Article as long as it holds the Amembership.

2. The Distributor of Modification may create the Modified Source Code based on the Source Code provided by T-Engine Forum and the Patch for Modification to be applied to create such Modified Source Code from the Source Code.

3. The Distributor of Modification shall, prior to the distribution, inform T-Engine Forum of and register a name and description of the Modified Source Code in such a way as specified by T-Engine Forum.

4. The Distributor of Modification shall determine the name of the Modified Source Code subject to the rules separately established by T-Engine Forum and publish an appropriate notice as required by the rules on the Patch for Modification and the Modified Source Code.

5. The Distributor of Modification may distribute the Modified Source Code to a third party, whether with or without payment, provided that the Distributor of Modification shall take the necessary measures to prohibit the third party from making the re-Distribution of the Modified Source Code.

6. Developer with the Patch for Modification, Provided, however, that the Distributor of Modification shall be obligated to confirm that the System Developer is the Source Code User duly licensed under Article 4.1.

7. The Distributor of Modification may perform the Vicarious Execution of Patch Processing for the System Developer.

8. The System Developer shall not distribute the Modified Source Code in further modified form to any third party as a stand-alone software product.

9. The System Developer may, under the same obligation as imposed in Article 4.5, make the Embedded Product available for the End User through use of the Patch for Modification distributed by the Distributor of Modification or the Derivative Works obtained through the Vicarious Execution of Patch Processing.

#### Article 6. Distribution and Registration of the Ported Source Code

1. The Source Code User and the System Developer may, whether with or without charge, distribute to any third party only the following parts of the Ported Source Code on the T-Engine Hardware or the Similar Hardware to T-Engine Hardware:

1. The Hardware-dependent Part and/or Compiler-dependent Part; provided that the Source Code User and the System Developer shall inform T-Engine Forum of, and T-Engine Forum may publish, a method for distributing said Part(s) to third parties.

2. The Header File; provided that the Header File shall be distributed together with the Binary Code of the Ported Source Code.

2. Any member of T-Engine Forum may request T-Engine Forum to register and distribute, as an original source code for T-Kernel, the Ported Source Code on the T-Engine Hardware or the Similar Hardware to T-Engine Hardware.

3. Any member of T-Engine Forum who requests the distribution mentioned in the preceding paragraph shall accede to the following conditions:

1. The member shall confirm that the object hardware is the T-Engine Hardware or the Similar Hardware to T-Engine Hardware.
2. The member shall provide T-Engine Forum with a complete set of operational environment for the object hardware and T-Kernel free of charge when requesting the distribution.
3. The member shall submit test results of the Ported Source Code to T-Engine Forum when requesting the distribution.

4. In the event that T-Engine Forum accepts the request mentioned in Article 6.2, T-Engine Forum shall register and distribute the Ported Source Code as the Source Code for T-Kernel. Provided, however, that the Ported Source Code may be treated in the same way as the Modified Source Code until the time of registration hereunder.

5. The provision set forth in Article 3 shall apply to the Ported Source Code registered in accordance with this Article.

#### Article 7. Use for Other Purpose

1. Any use of the Source Code, the Modified Source Code or the Ported Source Code other than those stipulated in Articles 4, 5 and 6 shall be subject to the prior approval of T-Engine Forum.

#### Article 8. Limited Warranty

1. T-Engine Forum and the copyright holder of the Source Code warrant that the Source Code does not infringe third party's copyrights. Provided, however, that T-Engine Forum and the copyright holder of the Source Code make no warranty as to the Hardware-dependent Part and/or Compiler- dependent Part set forth in Article 6.2 in the Ported Source Code by any third party.

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2. In case of breach of this License Agreement by a member of T-Engine Forum, T-Engine Forum may take appropriate measures against the member; for example, the member is disqualified from membership, depending on what kind of breach has been committed by it.

3. Any legal dispute which may arise in relation to any breach of this License Agreement shall be subject to the exclusive jurisdiction of the Tokyo District Court.

#### Article 11. Governing Law and Language

1. This License Agreement shall be governed by and interpreted under the laws of Japan.

2. This License Agreement is executed in both Japanese text and English text provided that the Japanese text shall govern the interpretation and performance of this License Agreement.

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Julian Seward, [jseward@bzip.org](mailto:jseward@bzip.org)

bzip2/libbzip2 version 1.0.5 of 10 December 2007

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Jean-loup Gailly Mark Adler

[jloup@gzip.org](mailto:jloup@gzip.org) [madler@alummi.caltech.edu](mailto:madler@alummi.caltech.edu)

The data format used by the zlib library is described by RFCs (Request for Comments) 1950 to 1952 in the files <http://www.ietf.org/rfc/rfc1950.txt> (zlib format), [rfc1951.txt](http://www.ietf.org/rfc/rfc1951.txt) (deflate format) and [rfc1952.txt](http://www.ietf.org/rfc/rfc1952.txt) (gzip format).

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