

## MANUAL FOR ENCLOSURE ASSEMBLY



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## Why a manual for designing enclosures?

Besides aluminum panels, Front Panel Express offers aluminum profiles for customized enclosures. Unlike prefabricated frames with set dimensions, our enclosure profiles and panels allow creation of enclosures best suited for their application.

This manual is provided to give basic calculation and formulas for enclosure design. These formulas can be applied to refine various design projects.

Our aluminum profiles are:

- **Side Profile 1 / Side Profile 2**

Two sides of the enclosure are made by the profiles at a set 42mm and 56mm height. The remaining four sides are made by panels. Self tapping screws mount the panels and profiles together.

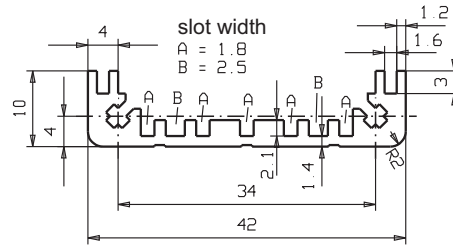
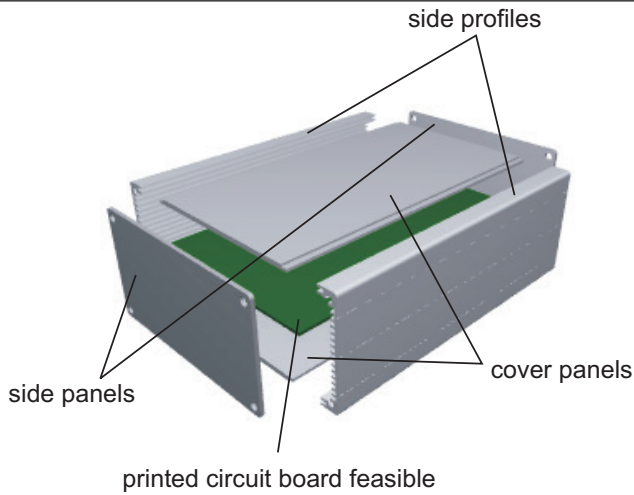
- **Housing Profile 1**

Enclosures using Housing profile 1 offer freely selectable dimensions. They support adjacent panels through slide-in profile slots. Machine screws (M5x50, will self tap into profile grooves) mount the panels and profiles together.

- **Housing Profile 2**

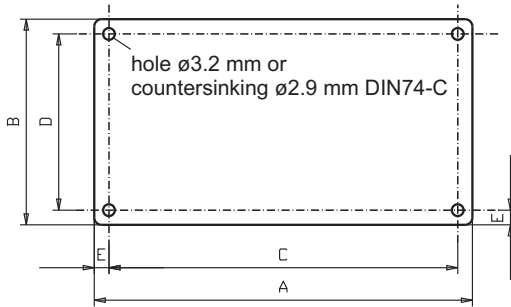
Compared to Housing Profile 1, this profile offers easy access to internal components. Side panels are threaded into a series of slide nuts. Housing Profile 1 and 2 can be used together.

### Side profile 1



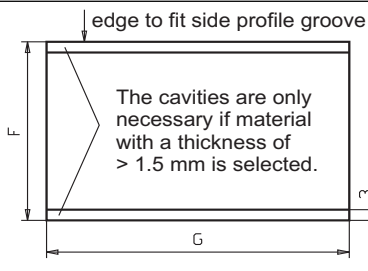
The length of the side profile is the same as the length of the cover panel (G).

### Side panels



|                           |                         |
|---------------------------|-------------------------|
| Width of enclosure (A) =  | $\geq 30; \leq 1000$ mm |
| or (A) =                  | Board width + 3 mm      |
| Height of enclosure (B) = | 42 mm                   |
| C =                       | A - 8 mm                |
| D =                       | 34 mm                   |
| E =                       | 4 mm                    |
| Material thickness =      | $\geq 2$ mm             |
| Corner radius =           | 2 mm                    |

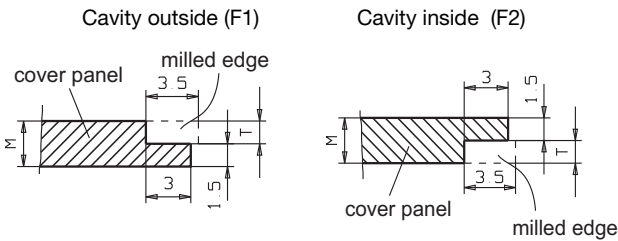
### Cover panels



|                          |                         |
|--------------------------|-------------------------|
| Cover panel length (G) = | $\geq 30; \leq 1000$ mm |
| Material thickness (M) = | $\geq 1.5$ mm           |
| Corner radius =          | 0 mm                    |
| Cover panel height (F) = | A - 14.2 mm             |

| Cavity | F1 (Case 1) | F2 (Case 2) |
|--------|-------------|-------------|
|--------|-------------|-------------|

|          |        |        |
|----------|--------|--------|
| Height = | 3.5 mm | 3.5 mm |
|----------|--------|--------|



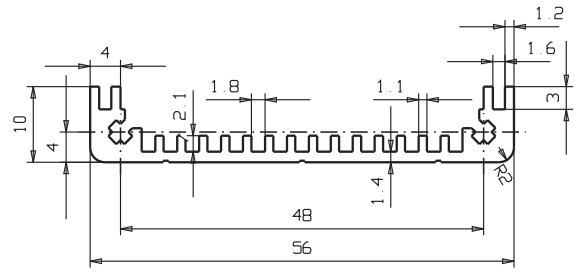
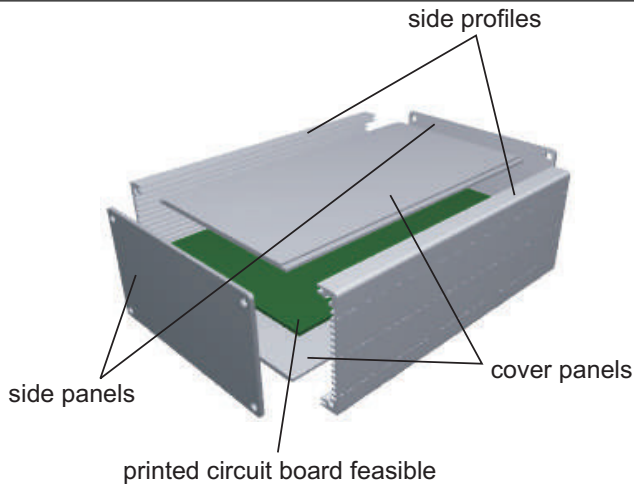
With material thicknesses >2.5 mm the cover panel overlaps the side profile. It is best to position the cavity inside.

|                  |                                                                 |             |
|------------------|-----------------------------------------------------------------|-------------|
| Width =          | G + 3 mm                                                        | G + 3 mm    |
| Depth (T) =      | M - 1.5 mm                                                      | M - 1.5 mm  |
| Cavity shape:    | rectangular                                                     | rectangular |
| Corner radius =  | 1.5 mm                                                          | 1.5 mm      |
| Tool =           | 3 mm                                                            | 3 mm        |
| Rotation angle = | 0° (when aligned horizontally)<br>90° (when aligned vertically) |             |
| On reverse side: | no                                                              | yes         |

When the alignment is vertical the X and Y values are exchanged.

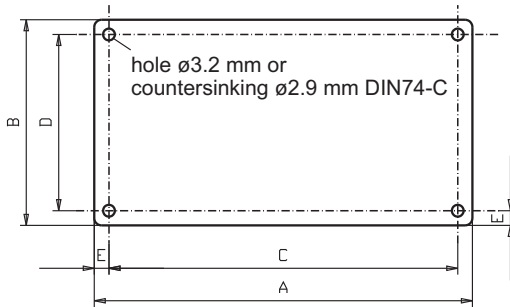
| Cavity placement (horizontal alignment) |     | F1 (Case 1) | F2 (Case 2) |
|-----------------------------------------|-----|-------------|-------------|
| lower cavity                            | X = | G / 2       | G / 2       |
|                                         | Y = | 1.25 mm     | 1.25 mm     |
| upper cavity                            | X = | G / 2       | G / 2       |
|                                         | Y = | F - 1.25 mm | F - 1.25 mm |

## Side profile 2



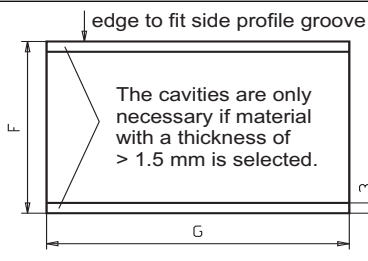
The length of the side profile is the same as the length of the cover panel (G).

## Side panels



|                           |                         |
|---------------------------|-------------------------|
| Width of enclosure (A) =  | $\geq 30; \leq 1000$ mm |
| or (A) =                  | Board width + 3 mm      |
| Height of enclosure (B) = | 56 mm                   |
| C =                       | A - 8 mm                |
| D =                       | 48 mm                   |
| E =                       | 4 mm                    |
| Material thickness =      | $\geq 2$ mm             |
| Corner radius =           | 2 mm                    |

## Cover panels



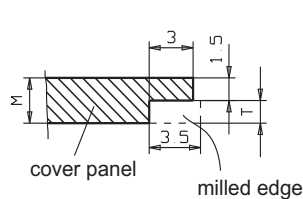
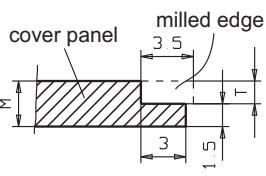
|                          |                         |
|--------------------------|-------------------------|
| Cover panel length (G) = | $\geq 30; \leq 1000$ mm |
| Material thickness (M) = | $\geq 1.5$ mm           |
| Corner radius =          | 0 mm                    |
| Cover panel height (F) = | A - 14.2 mm             |

| Cavity | F1 (Case 1) | F2 (Case 2) |
|--------|-------------|-------------|
|--------|-------------|-------------|

|          |        |        |
|----------|--------|--------|
| Height = | 3.5 mm | 3.5 mm |
|----------|--------|--------|

Cavity outside (F1)

Cavity inside (F2)



With material thicknesses >2.5 mm the cover panel overlaps the side profile. It is best to position the cavity inside.

|         |          |          |
|---------|----------|----------|
| Width = | G + 3 mm | G + 3 mm |
|---------|----------|----------|

|             |            |            |
|-------------|------------|------------|
| Depth (T) = | M - 1.5 mm | M - 1.5 mm |
|-------------|------------|------------|

|               |             |             |
|---------------|-------------|-------------|
| Cavity shape: | rectangular | rectangular |
|---------------|-------------|-------------|

|                 |        |        |
|-----------------|--------|--------|
| Corner radius = | 1.5 mm | 1.5 mm |
|-----------------|--------|--------|

|        |      |      |
|--------|------|------|
| Tool = | 3 mm | 3 mm |
|--------|------|------|

|                  |                                                                 |  |
|------------------|-----------------------------------------------------------------|--|
| Rotation angle = | 0° (when aligned horizontally)<br>90° (when aligned vertically) |  |
|------------------|-----------------------------------------------------------------|--|

|                  |    |     |
|------------------|----|-----|
| On reverse side: | no | yes |
|------------------|----|-----|

When the alignment is vertical the X and Y values are exchanged.

| Cavity placement (horizontal alignment) |  | F1 (Case 1) | F2 (Case 2) |
|-----------------------------------------|--|-------------|-------------|
|-----------------------------------------|--|-------------|-------------|

|              |     |       |       |
|--------------|-----|-------|-------|
| lower cavity | X = | G / 2 | G / 2 |
|--------------|-----|-------|-------|

|  |     |         |         |
|--|-----|---------|---------|
|  | Y = | 1.25 mm | 1.25 mm |
|--|-----|---------|---------|

|              |     |       |       |
|--------------|-----|-------|-------|
| upper cavity | X = | G / 2 | G / 2 |
|--------------|-----|-------|-------|

|  |     |             |             |
|--|-----|-------------|-------------|
|  | Y = | F - 1.25 mm | F - 1.25 mm |
|--|-----|-------------|-------------|

## Order numbers for side profiles 1 & 2 and accessories

Profiles are pre-anodized (cut edges expose raw aluminum)

| Designation              | Order – No.        | Remarks                                                                                                                                                   |
|--------------------------|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Side profile 1 (natural) | GL GP 10 11 - **** | **** corresponds to the required length in mm, min. 30 mm, max. 1000 mm. Cutting accuracy: up to 200 mm length $\pm 0.1$ mm, greater lengths $\pm 0.2$ mm |
| Side profile 2 (natural) | GL GP 10 21 - **** |                                                                                                                                                           |
| Side profile 1 (black)   | GL GP 10 13 - **** |                                                                                                                                                           |
| Side profile 2 (black)   | GL GP 10 23 - **** |                                                                                                                                                           |

### Accessories order numbers

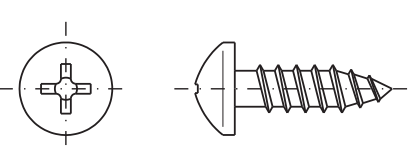
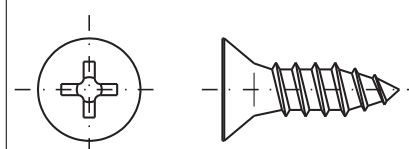
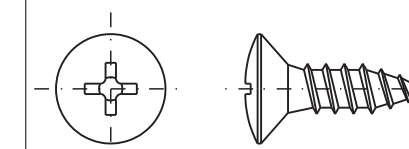
An assembly kit comprises 8  $\varnothing 2.9 \times 9.5$  mm screws in acc. with DIN 7981, 7982 or 7983 and 4 self-adhesive, black rubber feet,  $\varnothing 8$ mm, height = 2.5 mm. The screws are supplied as either nickel-plated, black or white galvanized.

A box of assorted screws contains 50  $\varnothing 2.9 \times 9.5$  mm screws in acc. with DIN 7981, 7982 or 7983. The screws are supplied as either nickel-plated, black or white galvanized.

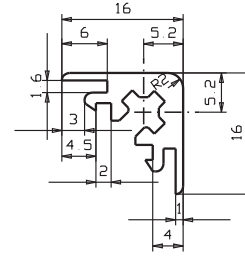
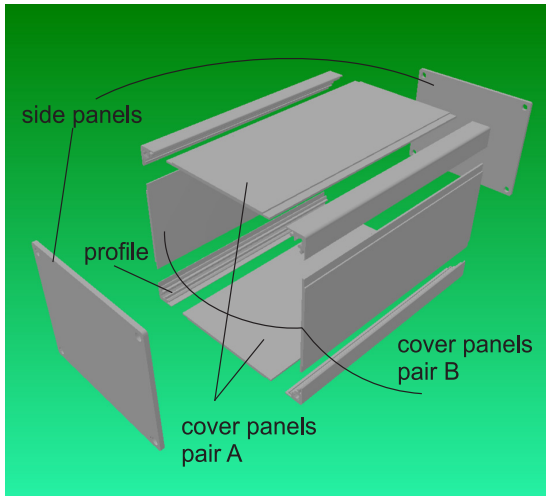
The  $\varnothing 2.9 \times 9.5$  mm screws are suitable for side panel thicknesses from 1.5 to 3.0 mm.

| Designation                    | Order-No.  | Screws (self tapping)                              |
|--------------------------------|------------|----------------------------------------------------|
| <b>Screws white galvanized</b> |            |                                                    |
| Assembly kit ISP / A3.0-ZI     | CG MS 1101 | Oval head screws in acc. with DIN 7981             |
| Assembly kit ISP / B3.0-ZI     | CG MS 1102 | Countersunk head screws in acc. with DIN 7982      |
| Assembly kit ISP / C3.0-ZI     | CG MS 1103 | Oval countersunk head screws in acc. with DIN 7983 |
| Screw assortment ISP / A3.0-ZI | CG SO 1101 | Oval head screws in acc. with DIN 7981             |
| Screw assortment ISP / B3.0-ZI | CG SO 1102 | Countersunk head screws in acc. with DIN 7982      |
| Screw assortment ISP / C3.0-ZI | CG SO 1103 | Oval countersunk head screws in acc. with DIN 7983 |
| <b>Screws nickel-plated</b>    |            |                                                    |
| Assembly kit ISP / A3.0-NI     | CG MS 1111 | Oval head screws in acc. with DIN 7981             |
| Assembly kit ISP / B3.0-NI     | CG MS 1112 | Countersunk head screws in acc. with DIN 7982      |
| Assembly kit ISP / C3.0-NI     | CG MS 1113 | Oval countersunk head screws in acc. with DIN 7983 |
| Screw assortment ISP / A3.0-NI | CG SO 1111 | Oval head screws in acc. with DIN 7981             |
| Screw assortment ISP / B3.0-NI | CG SO 1112 | Countersunk head screws in acc. with DIN 7982      |
| Screw assortment ISP / C3.0-NI | CG SO 1113 | Oval countersunk head screws in acc. with DIN 7983 |
| <b>Screws black galvanized</b> |            |                                                    |
| Assembly kit ISP / A3.0-SW     | CG MS 1121 | Oval head screws in acc. with DIN 7981             |
| Assembly kit ISP / B3.0-SW     | CG MS 1122 | Countersunk head screws in acc. with DIN 7982      |
| Assembly kit ISP / C3.0-SW     | CG MS 1123 | Oval countersunk head screws in acc. with DIN 7983 |
| Screw assortment ISP / A3.0-SW | CG SO 1121 | Oval head screws in acc. with DIN 7981             |
| Screw assortment ISP / B3.0-SW | CG SO 1122 | Countersunk head screws in acc. with DIN 7982      |
| Screw assortment ISP / C3.0-SW | CG SO 1123 | Oval countersunk head screws in acc. with DIN 7983 |

### Screw guide (3:1 scale)

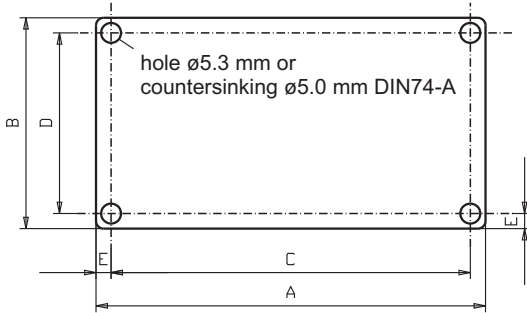
| DIN 7981                                                                            | DIN 7982                                                                            | DIN 7983                                                                              |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |  |
|                                                                                     |                                                                                     |                                                                                       |

# Housing profile 1



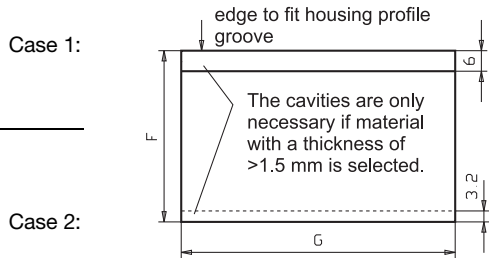
The length of the housing profile is the same as the length of the cover panel (G).

## Side panels

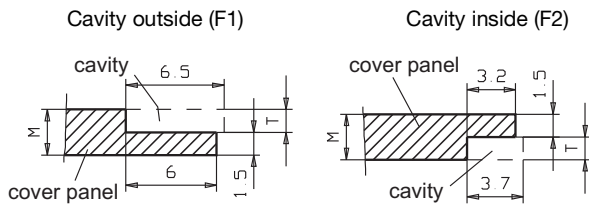


|                           |                         |
|---------------------------|-------------------------|
| Width of enclosure (A) =  | $\geq 40; \leq 1000$ mm |
| Height of enclosure (B) = | $\geq 40; \leq 1000$ mm |
| C =                       | A - 10.4 mm             |
| D =                       | B - 10.4 mm             |
| E =                       | 5.2 mm                  |
| Material thickness =      | $\geq 2$ mm             |
| Corner radius =           | 2 mm                    |

## Cover panels



|                          | Pair A                  | Pair B      |
|--------------------------|-------------------------|-------------|
| Cover plate length (G) = | $\geq 40; \leq 1000$ mm |             |
| Material thickness (M) = | $\geq 1.5$ mm           |             |
| Corner radius =          | 0 mm                    |             |
| Cover plate height (F) = | A - 20.2 mm             | B - 20.2 mm |
| Cavities                 | F1 (Case 1)             | F2 (Case 2) |



|                  |                                                                 |             |
|------------------|-----------------------------------------------------------------|-------------|
| Height =         | 6.5 mm                                                          | 3.7 mm      |
| Width =          | G + 3 mm                                                        | G + 3 mm    |
| Depth (T) =      | M - 1.5 mm                                                      | M - 1.5 mm  |
| Cavity shape:    | rectangular                                                     | rectangular |
| Corner radius =  | 1.5 mm                                                          | 1.5 mm      |
| Tool =           | 3 mm                                                            | 3 mm        |
| Rotation angle = | 0° (when aligned horizontally)<br>90° (when aligned vertically) |             |
| On reverse side: | no                                                              | yes         |

With material thicknesses >2.5 mm the cover panel overlaps the side profile. It is best to position the cavity inside.

When the alignment is vertical the X and Y values are exchanged.

| Cavity placement (horizontal alignment) |     | F1 (Case 1) | F2 (Case 2) |
|-----------------------------------------|-----|-------------|-------------|
| lower cavity                            | X = | G / 2       | G / 2       |
|                                         | Y = | 2.75 mm     | 1.35 mm     |
| upper cavity                            | X = | G / 2       | G / 2       |
|                                         | Y = | F - 2.75 mm | F - 1.35 mm |



## Order numbers for housing profile 1 and accessories

Profiles are pre-anodized (cut edges expose raw aluminum)

| Designation                 | Order – No.        | Remarks                                                                                                                                                   |
|-----------------------------|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Housing profile 1 (natural) | GL GP 20 11 - **** | **** corresponds to the required length in mm, min. 30 mm, max. 1000 mm. Cutting accuracy: up to 200 mm length $\pm 0.1$ mm, greater lengths $\pm 0.2$ mm |
| Housing profile 1 (black)   | GL GP 20 13 - **** |                                                                                                                                                           |

### Accessories

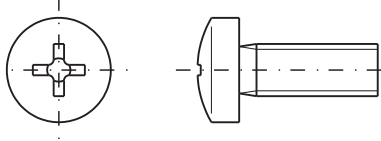
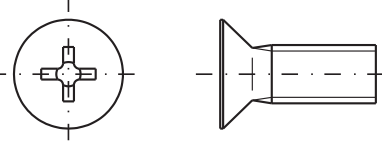
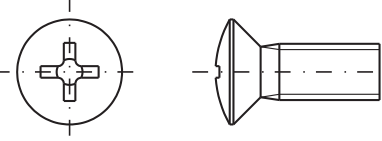
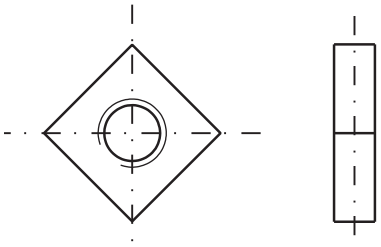
An assembly kit comprises 8 M5 x 20 mm screws in acc. with DIN 7985, 965 or 966 and 4 self-adhesive, black rubber feet,  $\varnothing 8$  mm, height = 2.5 mm. The screws are supplied as either nickel-plated, black or white galvanized.

A box of assorted screws contains 50 M5 x 20 mm screws in acc. with DIN 7985, 965 or 966. The screws are supplied as either nickel-plated, black or white galvanized.

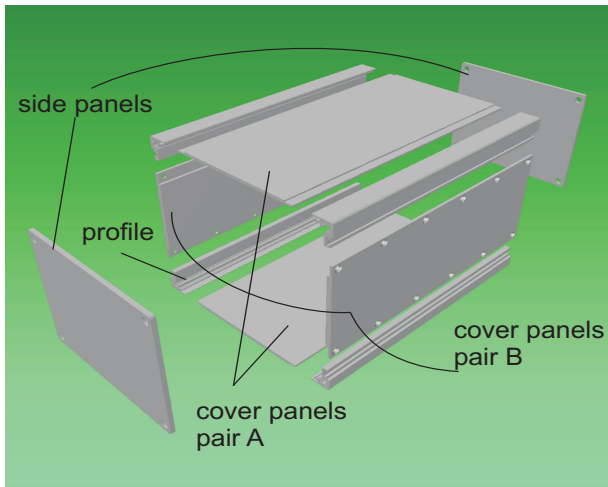
The M5 x 20 mm screws are suitable for side panel thicknesses from 1.5 to 6.0 mm.

| Designation                    | Order-No.  | Screws (machine screws)                            |
|--------------------------------|------------|----------------------------------------------------|
| <b>Screws white galvanized</b> |            |                                                    |
| Assembly kit IGP / A6.0-ZI     | CG MS 1601 | Oval countersunk head screws in acc. with DIN 7985 |
| Assembly kit IGP / B6.0-ZI     | CG MS 1602 | Countersunk head screws in acc. with DIN 965       |
| Assembly kit IGP / C6.0-ZI     | CG MS 1603 | Oval countersunk head screws in acc. with DIN 966  |
| Screw assortment IGP / A6.0-ZI | CG SO 1601 | Oval countersunk head screws in acc. with DIN 7985 |
| Screw assortment IGP / B6.0-ZI | CG SO 1602 | Countersunk head screws in acc. with DIN 965       |
| Screw assortment IGP / C6.0-ZI | CG SO 1603 | Oval countersunk head screws in acc. with DIN 966  |
| <b>Screws nickel-plated</b>    |            |                                                    |
| Assembly kit IGP / A6.0-NI     | CG MS 1611 | Oval countersunk head screws in acc. with DIN 7985 |
| Assembly kit IGP / B6.0-NI     | CG MS 1612 | Countersunk head screws in acc. with DIN 965       |
| Assembly kit IGP / C6.0-NI     | CG MS 1613 | Oval countersunk head screws in acc. with DIN 966  |
| Screw assortment IGP / A6.0-NI | CG SO 1611 | Oval countersunk head screws in acc. with DIN 7985 |
| Screw assortment IGP / B6.0-NI | CG SO 1612 | Countersunk head screws in acc. with DIN 965       |
| Screw assortment IGP / C6.0-NI | CG SO 1613 | Oval countersunk head screws in acc. with DIN 966  |
| <b>Screws black galvanized</b> |            |                                                    |
| Assembly kit IGP / A6.0-SW     | CG MS 1621 | Oval countersunk head screws in acc. with DIN 7985 |
| Assembly kit IGP / B6.0-SW     | CG MS 1622 | Countersunk head screws in acc. with DIN 965       |
| Assembly kit IGP / C6.0-SW     | CG MS 1623 | Oval countersunk head screws in acc. with DIN 966  |
| Screw assortment IGP / A6.0-SW | CG SO 1621 | Oval countersunk head screws in acc. with DIN 7985 |
| Screw assortment IGP / B6.0-SW | CG SO 1622 | Countersunk head screws in acc. with DIN 965       |
| Screw assortment IGP / C6.0-SW | CG SO 1623 | Oval countersunk head screws in acc. with DIN 966  |

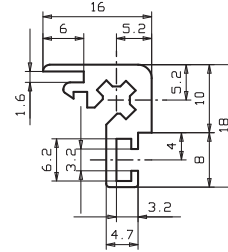
### Screw guide (3:1 scale)

| DIN 7985                                                                            | DIN 965                                                                             | DIN 966                                                                               |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |  |
| DIN 562                                                                             |                                                                                     |                                                                                       |
|  |                                                                                     |                                                                                       |

## Housing profile 2



Missing dimensions see housing profile 1



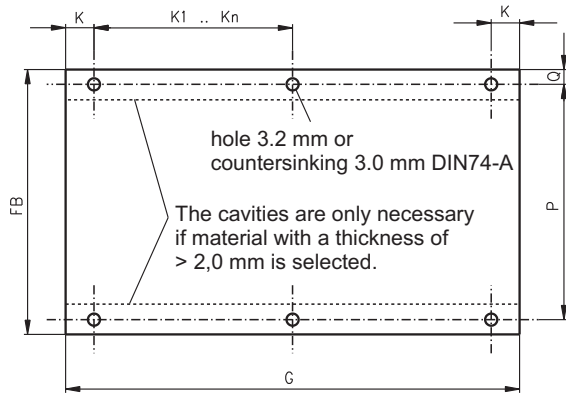
The length of the housing profil is the same as the length of the cover panel (G).

### Side panels

see housing profile 1

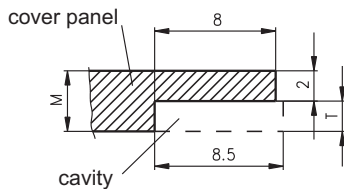
Cover panels pair A see housing profile 1

### Cover panels pair B



|                          | Pair B                       |
|--------------------------|------------------------------|
| Cover panel length (G) = | $\geq 40; \leq 1000$ mm      |
| Material thickness (M) = | $> 1.5$ mm                   |
| Corner radius =          | 0                            |
| FB =                     | $B - 20.2$ mm                |
| K =                      | min. 5 mm; max. 10 mm        |
| K1 .. Kn                 | min. 50 mm; max 100 mm       |
| Q =                      | 3.9 mm                       |
| P =                      | $FB - 7.8$ mm or $B - 28$ mm |

### Cavity facing inwards



|                      | Cavity                                                          |
|----------------------|-----------------------------------------------------------------|
| Height =             | 8.5 mm                                                          |
| Width =              | $G + 3$ mm                                                      |
| Depth (T) =          | $M - 2.0$ mm                                                    |
| Cavity shape:        | rectangular                                                     |
| Corner radius =      | 1.5 mm                                                          |
| Tool =               | 3 mm                                                            |
| Rotation angle =     | 0° (when aligned horizontally)<br>90° (when aligned vertically) |
| On the reverse side: | yes                                                             |

When the alignment is vertical the X and Y values are exchanged.

### Cavity placement (horizontal alignment)

|              |     |                |
|--------------|-----|----------------|
| lower cavity | X = | $G/2$          |
|              | Y = | 3.75 mm        |
| upper cavity | X = | $G/2$          |
|              | Y = | $FB - 3.75$ mm |

## Order numbers for housing profile 2 and accessories

Profiles are pre-anodized (cut edges expose raw aluminum)

| Designation                 | Order – No.        | Remarks                                                                                                                                                   |
|-----------------------------|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Housing profile 2 (natural) | GL GP 20 21 - **** | **** corresponds to the required length in mm, min. 30 mm, max. 1000 mm. Cutting accuracy: up to 200 mm length $\pm 0.1$ mm, greater lengths $\pm 0.2$ mm |
| Housing profile 2 (black)   | GL GP 20 23 - **** |                                                                                                                                                           |

**Accessories** (Please use the order numbers for the assembly kit or the screw assortment from the “Order numbers for housing profile 1 and accessories” overview)

Assembling cover panel pair B will require the screws detailed below.

An assembly kit contains 12 screws M3 x 4 mm or M3 x 5 mm in acc. with DIN 7985, 965 or 966 and 12 square nuts M3 in acc. with DIN 562. The screws are supplied as either nickel-plated, black or white galvanized, the nuts are always white galvanized.

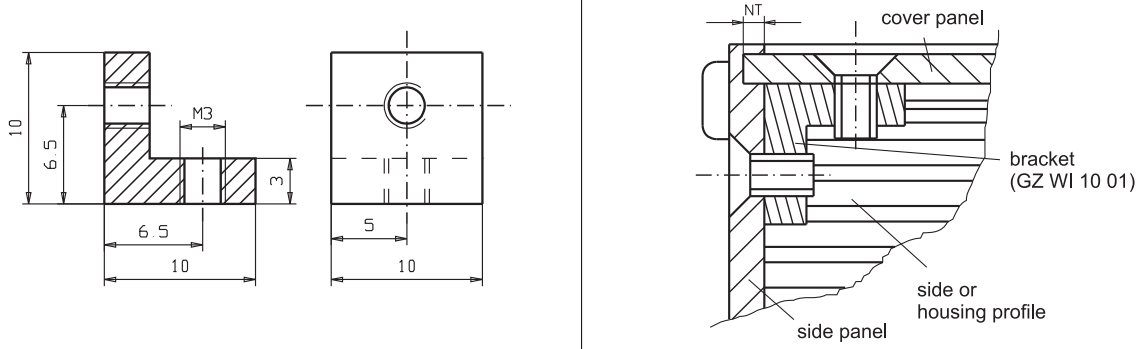
A box of screw assortment contains 50 screws M3 x 4 mm or M3 x 5 mm in acc. with DIN 7985, 965 or 966 or 50 square nuts M3 in acc. with DIN 562. The screws are supplied as either nickel-plated, black or white galvanized.

The M3 x 4 mm screws are suitable for 1.5 mm and the M3 x 5 mm screws for 2.0 to 2.5 mm thick cover panels (excluding the cavity).

| Designation                     | Order-No.  | Screws (all machine screws)                       |
|---------------------------------|------------|---------------------------------------------------|
| <b>Screws white galvanized</b>  |            |                                                   |
| Assembly kit IGPS / A1.5-ZI     | CG MS 1701 | Oval head screws in acc. with DIN 7985            |
| Assembly kit IGPS / B1.5-ZI     | CG MS 1702 | Countersunk head screws in acc. with DIN 965      |
| Assembly kit IGPS / C1.5-ZI     | CG MS 1703 | Oval countersunk head screws in acc. with DIN 966 |
| Assembly kit IGPS / A2.5-ZI     | CG MS 1731 | Oval head screws in acc. with DIN 7985            |
| Assembly kit IGPS / B2.5-ZI     | CG MS 1732 | Countersunk head screws in acc. with DIN 965      |
| Assembly kit IGPS / C2.5-ZI     | CG MS 1733 | Oval countersunk head screws in acc. with DIN 966 |
| Screw assortment IGPS / A1.5-ZI | CG SO 1701 | Oval head screws in acc. with DIN 7985            |
| Screw assortment IGPS / B1.5-ZI | CG SO 1702 | Countersunk head screws in acc. with DIN 965      |
| Screw assortment IGPS / C1.5-ZI | CG SO 1703 | Oval countersunk head screws in acc. with DIN 966 |
| Screw assortment IGPS / A2.5-ZI | CG SO 1731 | Oval head screws in acc. with DIN 7985            |
| Screw assortment IGPS / B2.5-ZI | CG SO 1732 | Countersunk head screws in acc. with DIN 965      |
| Screw assortment IGPS / C2.5-ZI | CG SO 1733 | Oval countersunk head screws in acc. with DIN 966 |
| Screw assortment IGPS / M - ZI  | CG SO 9903 | Square nuts M3 in acc. with DIN 562               |
| <b>Screws nickel-plated</b>     |            |                                                   |
| Assembly kit IGPS / A1.5-NI     | CG MS 1711 | Oval head screws in acc. with DIN 7985            |
| Assembly kit IGPS / B1.5-NI     | CG MS 1712 | Countersunk head screws in acc. with DIN 965      |
| Assembly kit IGPS / C1.5-NI     | CG MS 1713 | Oval countersunk head screws in acc. with DIN 966 |
| Assembly kit IGPS / A2.5-NI     | CG MS 1741 | Oval head screws in acc. with DIN 7985            |
| Assembly kit IGPS / B2.5-NI     | CG MS 1742 | Countersunk head screws in acc. with DIN 965      |
| Assembly kit IGPS / C2.5-NI     | CG MS 1743 | Oval countersunk head screws in acc. with DIN 966 |
| Screw assortment IGPS / A1.5-NI | CG SO 1711 | Oval head screws in acc. with DIN 7985            |
| Screw assortment IGPS / B1.5-NI | CG SO 1712 | Countersunk head screws in acc. with DIN 965      |
| Screw assortment IGPS / C1.5-NI | CG SO 1713 | Oval countersunk head screws in acc. with DIN 966 |
| Screw assortment IGPS / A2.5-NI | CG SO 1741 | Oval head screws in acc. with DIN 7985            |
| Screw assortment IGPS / B2.5-NI | CG SO 1742 | Countersunk head screws in acc. with DIN 965      |
| Screw assortment IGPS / C2.5-NI | CG SO 1743 | Oval countersunk head screws in acc. with DIN 966 |
| <b>Screws black galvanized</b>  |            |                                                   |
| Assembly kit IGPS / A1.5-SW     | CG MS 1721 | Oval head screws in acc. with DIN 7985            |
| Assembly kit IGPS / B1.5-SW     | CG MS 1722 | Countersunk head screws in acc. with DIN 965      |
| Assembly kit IGPS / C1.5-SW     | CG MS 1723 | Oval countersunk head screws in acc. with DIN 966 |
| Assembly kit IGPS / A2.5-SW     | CG MS 1751 | Oval head screws in acc. with DIN 7985            |
| Assembly kit IGPS / B2.5-SW     | CG MS 1752 | Countersunk head screws in acc. with DIN 965      |
| Assembly kit IGPS / C2.5-SW     | CG MS 1753 | Oval countersunk head screws in acc. with DIN 966 |
| Screw assortment IGPS / A1.5-SW | CG SO 1721 | Oval head screws in acc. with DIN 7985            |
| Screw assortment IGPS / B1.5-SW | CG SO 1722 | Countersunk head screws in acc. with DIN 965      |
| Screw assortment IGPS / C1.5-SW | CG SO 1723 | Oval countersunk head screws in acc. with DIN 966 |
| Screw assortment IGPS / A2.5-SW | CG SO 1751 | Oval head screws in acc. with DIN 7985            |
| Screw assortment IGPS / B2.5-SW | CG SO 1752 | Countersunk head screws in acc. with DIN 965      |
| Screw assortment IGPS / C2.5-SW | CG SO 1753 | Oval countersunk head screws in acc. with DIN 966 |

# Housing bracket

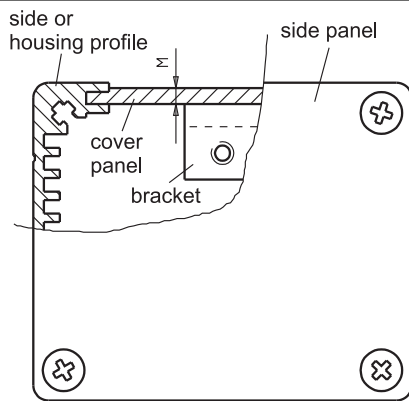
## Description



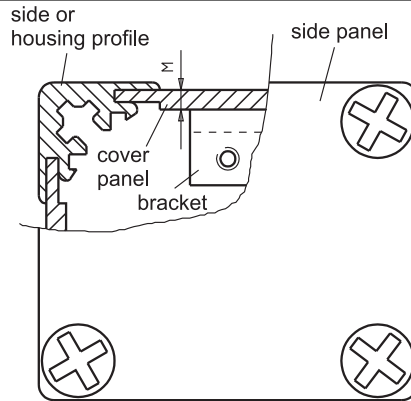
The housing bracket GZ WI 10 01 can be used, to stabilise enclosures which are assembled from side or housing profiles. The use of this bracket is recommended if the width is greater than 150 mm (for housing profiles this also applies for the height).

## Definition by cases

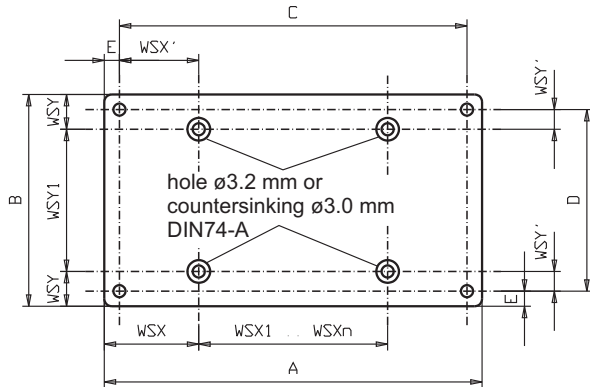
Case 1



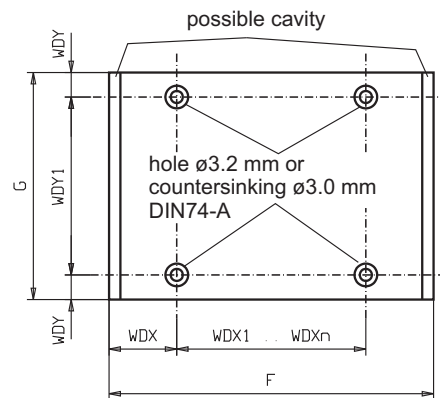
Case 2



Side panels



Cover panels



## Equations

|                            | Side profiles           |            | Housing profiles        |            |                                  |                    |
|----------------------------|-------------------------|------------|-------------------------|------------|----------------------------------|--------------------|
|                            | Case 1                  | Case 2     | Case 1                  | Case 2     |                                  |                    |
| WSX=                       | min. 50 mm; max. 100 mm |            | min. 50 mm; max. 100 mm |            | A:                               | enclosure width    |
| WSX1 .. n=                 | min. 80 mm; max. 100 mm |            | min. 80 mm; max. 100 mm |            | B:                               | enclosure height   |
| WSX'                       | WSX - 4 mm              |            | WSX - 5,2 mm            |            | C =                              | A - 2E             |
| WSY=                       | 9.3 mm                  | M + 7.7 mm | 9.1 mm                  | M + 7.5 mm | D =                              | B - 2E             |
| WSY'                       | 5.3 mm                  | M + 3.7 mm | 3.9 mm                  | M + 2.3 mm | E <sub>(side profile)</sub> =    | 4.0 mm             |
| WDX=                       | WSX - 7.1 mm            |            | WSX - 10,1 mm           |            | E <sub>(housing profile)</sub> = | 5.2 mm             |
| WDX1 .. n=                 | WSX1 .. n               |            | WSX1 .. n               |            | F:                               | cover panel width  |
| WDY <sub>(NT=0)</sub> =    | 6.5 mm                  |            | 6.5 mm                  |            | G:                               | cover panel length |
| WDY <sub>(NT&gt;0)</sub> = | NT + 6.4 mm             |            | NT + 6.4 mm             |            | WSY1=                            | B - 2WSY           |
|                            |                         |            |                         |            | WDY1=                            | G - 2WDY           |

## Order numbers for housing brackets

Housing brackets are anodized natural aluminum

| Designation                   | Order – No. | Remarks         |
|-------------------------------|-------------|-----------------|
| Housing bracket 4 x per unit  | GG WS 0111  | drummed surface |
| Housing bracket 8 x per unit  | GG WS 0112  |                 |
| Housing bracket 12 x per unit | GG WS 0113  |                 |
| Housing bracket 25 x per unit | GG WS 0114  |                 |

To assemble a housing bracket you will require 2 screws M3 x 5 mm, M3 x 6 mm or M3 x 8 mm.

A screw packet contains 50 M3 x 5 mm, M3 x 6 mm or M3 x 8 mm screws in acc. with DIN 7985, 965 or 966. The screws are supplied as either nickel-plated, black or white galvanized.

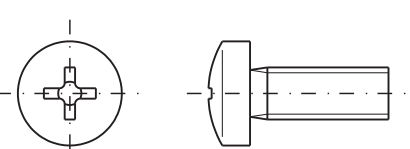
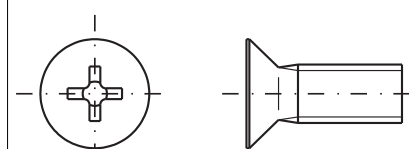
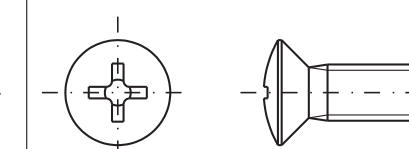
The M3 x 5 mm screws are suitable for 1.5 mm thick panels.

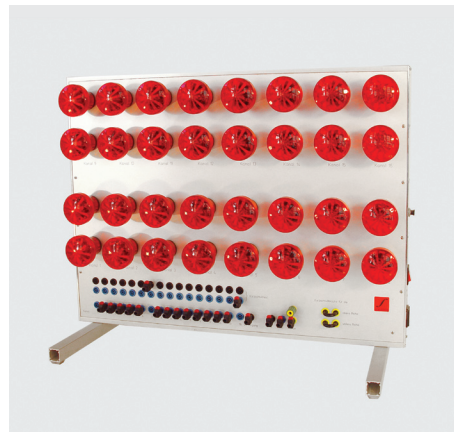
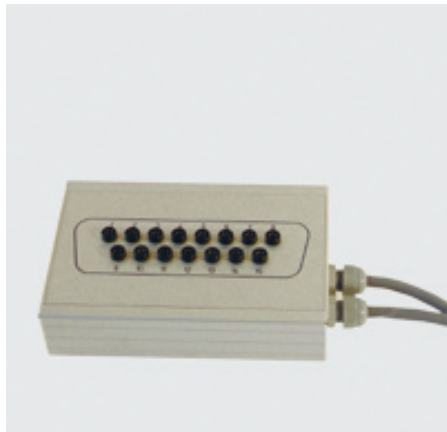
The M3 x 6 mm screws are suitable for 2.0 – 3.0 mm thick panels.

The M3 x 8 mm screws are suitable for 4.0 mm thick panels.

| Designation                    | Order-No.  | Screws (all machine screws)                       |
|--------------------------------|------------|---------------------------------------------------|
| <b>Screws white galvanized</b> |            |                                                   |
| Screw packet M3x5-7985-ZI      | CG RB 1105 | Oval head screws in acc. with DIN 7985            |
| Screw packet M3x5-965-ZI       | CG RB 1305 | Countersunk head screws in acc. with DIN 965      |
| Screw packet M3x5-966-ZI       | CG RB 1405 | Oval countersunk head screws in acc. with DIN 966 |
| Screw packet M3x6-7985-ZI      | CG RB 1106 | Oval head screws in acc. with DIN 7985            |
| Screw packet M3x6-965-ZI       | CG RB 1306 | Countersunk head screws in acc. with DIN 965      |
| Screw packet M3x6-966-ZI       | CG RB 1406 | Oval countersunk head screws in acc. with DIN 966 |
| Screw packet M3x8-7985-ZI      | CG RB 1108 | Oval head screws in acc. with DIN 7985            |
| Screw packet M3x8-965-ZI       | CG RB 1308 | Countersunk head screws in acc. with DIN 965      |
| Screw packet M3x8-966-ZI       | CG RB 1408 | Oval countersunk head screws in acc. with DIN 966 |
| <b>Screws nickel-plated</b>    |            |                                                   |
| Screw packet M3x5-7985-NI      | CG RB 2105 | Oval head screws in acc. with DIN 7985            |
| Screw packet M3x5-965-NI       | CG RB 2305 | Countersunk head screws in acc. with DIN 965      |
| Screw packet M3x5-966-NI       | CG RB 2405 | Oval countersunk head screws in acc. with DIN 966 |
| Screw packet M3x6-7985-NI      | CG RB 2106 | Oval head screws in acc. with DIN 7985            |
| Screw packet M3x6-965-NI       | CG RB 2306 | Countersunk head screws in acc. with DIN 965      |
| Screw packet M3x6-966-NI       | CG RB 2406 | Oval countersunk head screws in acc. with DIN 966 |
| Screw packet M3x8-7985-NI      | CG RB 2108 | Oval head screws in acc. with DIN 7985            |
| Screw packet M3x8-965-NI       | CG RB 2308 | Countersunk head screws in acc. with DIN 965      |
| Screw packet M3x8-966-NI       | CG RB 2408 | Oval countersunk head screws in acc. with DIN 966 |
| <b>Screws black galvanized</b> |            |                                                   |
| Screw packet M3x5-7985-SW      | CG RB 3105 | Oval head screws in acc. with DIN 7985            |
| Screw packet M3x5-965-SW       | CG RB 3305 | Countersunk head screws in acc. with DIN 965      |
| Screw packet M3x5-966-SW       | CG RB 3405 | Oval countersunk head screws in acc. with DIN 966 |
| Screw packet M3x6-7985-SW      | CG RB 3106 | Oval head screws in acc. with DIN 7985            |
| Screw packet M3x6-965-SW       | CG RB 3306 | Countersunk head screws in acc. with DIN 965      |
| Screw packet M3x6-966-SW       | CG RB 3406 | Oval countersunk head screws in acc. with DIN 966 |
| Screw packet M3x8-7985-SW      | CG RB 3108 | Oval head screws in acc. with DIN 7985            |
| Screw packet M3x8-965-SW       | CG RB 3308 | Countersunk head screws in acc. with DIN 965      |
| Screw packet M3x8-966-SW       | CG RB 3408 | Oval countersunk head screws in acc. with DIN 966 |

### Screw guide (M 3:1)

| DIN 7985                                                                            | DIN 965                                                                             | DIN 966                                                                               |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |  |



Front Panel Express, LLC

5959 Corson Avenue South, Suite I  
Seattle, WA 98108

Phone +1 (206) 768-0602

Fax +1 (206) 768-0679

[info@frontpanelexpress.com](mailto:info@frontpanelexpress.com)

[www.frontpanelexpress.com](http://www.frontpanelexpress.com)

